NUMARINE

Numarine 32XP Explorer Yacht

Technical Specifications August 2018

This technical specifications and any GA attached form the basic outline of the Numarine 32XP Explorer Yacht and will be an integral part of the agreement between the Customer and Numarine.

Additions or alterations to this specification will be documented within the sales agreement or construction contract which will take precedent over this specification.

Involved Parties

Builder:	**Numarine**
Naval Architecture:	Umberto Tagliavini
Engineering:	Umberto Tagliavini
	Ibrahim Karatas
	Numarine Design Office
Exterior Design:	Can Yalman
Interior Design:	Can Yalman
	Esra Kazmirci
	Numarine Design Office

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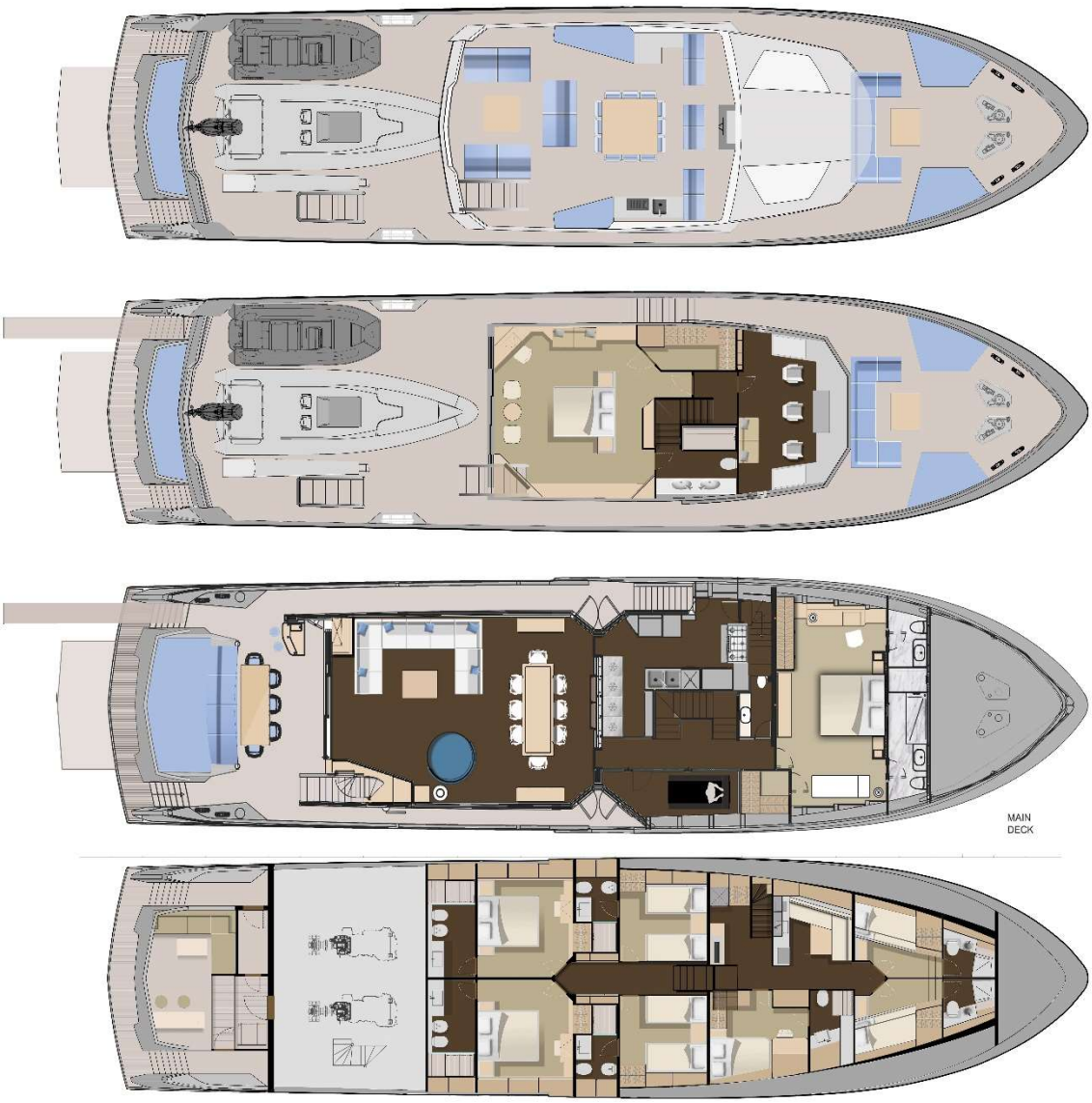

GENERAL ARRANGEMENT

I. GENERAL

I. 1 DEFINITIONS

Max speed: the speed reached at max output of the main engines, measured at trial displacement and with stabilizers in neutral position.

Cruising speed: the speed calculated at 70% of the max load of the main engines, measured at trial displacement and with stabilizers in neutral position

Economic speed: the speed chosen to be the reference for the calculation of the max range of the vessel.

Trial Displacement: displacement calculated as the light ship weight, plus liquids in circulation, plus a weight corresponding to 1/2 of the liquids of the Full Load deadweight.

Max range: the range calculated in the following conditions: economic speed at half load with clean hull and stabilizers in neutral position, 1 Diesel Generator running at 50% of the load for critical systems, calm sea and wind.

Passenger: "any person" carried in a ship except: (a) a person employed or engaged in any capacity on board the ship on the business of the ship; (b) a person on board the ship either in pursuance of the obligation laid upon the master to carry shipwrecked, distressed or other persons, or by reason of any circumstances that neither the master nor the owner nor the charterer (if any) could have prevented; and (c) a child under one year of age." (see LY3 definitions).

Technical Space: a switchboard room from where the control of the main AC systems is also possible (see relevant chapter). Control room is independent to the Engine Room from a fire risk point of view.

Diesel oil: not readily flammable combustible oil used for main propulsion engines and for aft tender.

*I.*2 DESCRIPTION

This vessel is a motor yacht with a displacement hull, twin screw propellers and twin diesel engines.

The yacht has a steel hull and FRP superstructure.

The yacht is designed for both offshore cruising and worldwide cruising and will have the appropriate stability, sea keeping, manoeuvrability and general handling requisites.

The design and construction shall generally be in accordance with the following specifications and all materials used and works carried out shall be in conformity with the best yacht & shipbuilding standards.

If, as a result of increased experience or general technical developments, other designs, materials or methods of manufacture than those stated in this specification are found to be more efficient or better suited for the intended purpose, they may be adopted; such alterations however, are to be approved by the Owner or his representative before being carried out.

*I.*3 DIMENSIONS

Length overall:	32.5 m
Waterline Length at full load:	30.69 m
Beam max:	8.00 m
Depth D:	abt. 3.9 m
Draft at full load T:	abt. 2.28 m
Displacement half load:	abt 260 tonnes
Displacement full load Δ:	abt. 270 tonnes
International Gross Tonnage:	under 300 GT
Passengers:	n° 12 (6 cabins)
Crew:	n° 5 (3 cabins on lower deck)

*I.*4 CONSTRUCTION

Hull material:	Fe 510 C Grade A with RINA Spa certificate
Superstructure material:	FRP construction with vinylester resin
Deck fittings:	316 stainless steel
Shafts:	F51 (4462) Duplex stainless steel
Struts:	Steel
Rudders & propellers :	AB2 Bronze

*I.*5 PROPULSION

Engines:	CAT C18 ACERT C 715bhp @2100rpm
Gearbox:	ZF 665A
Ratio:	2.96:1
Bow Thruster:	45Kw – 600Kgf thrust
Stern Thruster:	30Kw – 470Kgf thrust

*I.*6 TANKAGE +/- 5%

Fuel Oil Tankage	**29,000 L inc. Day Tanks**
Fresh Water Tankage	**3,000 L**
Black Water Tankage	**1,900 L**
Grey Water Tankage	**1,900 L**
Sludge/Dirty Oil Tankage	**600 L**

*I.*7 PERFORMANCE

Max speed:	**13.8 knots**
Cruising speed:	**12 knots**
Economic Speed:	**8 knots**
Max range:	**4000 nm**

Note: Figures based on previous performance, actual figures on each vessel may vary by up to 10%.

*I.*8 NOISE AND VIBRATION CONTROL

This Yacht is designed in conjunction with SILENT LINE GROUP Innovative Solutions | Products and Services Van Cappellen consultants to the highest standard for noise and vibration, each machine is studied to evaluate the best mounting and connection solution to provide optimum isolation preventing vibration transfer into the structure, free airborne noise is minimised and insulated with the latest technology in sound absorbance and blocking. The yacht is designed to comply with or exceed RINA "Comfort Class" certification as proven with previous vessels.

*I.*9 CLASSIFICATION

RINA C +Hull •Mach, Y Unrestricted Navigation

The vessel shall be designed, constructed and classed to RINA, SpA Code of Practice for Safety of Pleasure Craft and Motor Vessels for vessels under 300GT and less than 50 meters in length.

*I.*10 STABILITY AND BUOYANCY

The vessel is designed in accordance with the impact and damage stability requirements of RINA Pleasure Class.

Prediction of the weight and centre of gravity of the vessel has been performed at an early stage of design.

Before delivery of the vessel, an inclining experiment will be carried out in order to confirm the preliminary calculations. Following the results of the Inclining experiment, a stability booklet, containing the stability data of the yacht and the stability instructions to the Master, shall be issued by the Builder and certified by RINA.

*I.*11 DRAWINGS

Numarine will prepare drawings and will carry out calculations necessary for the construction of the vessel in accordance with the requirements of the RINA.

Outfitting and engineering details will be chosen within the Builder standards. Special requests will be examined and quoted accordingly.

The following drawings of the vessel shall be produced and approved by RINA as required for production, the Owner's representatives upon request has the opportunity to check the conformity of the design with the contractual obligation but any request for alteration to the drawings must be made early in the build process, if the Builder receives no indication of changes or contradictory remarks, they will be considered automatically approved.

The drawings will be sent in .pdf format during construction in English language.

Upon delivery, one hard copies plus 2 USB memory sticks with the digital versions will be delivered to the Owner.

- General Arrangement Plan and External Profile
- Hydrostatic and stability study
- Capacity plan
- Hull and superstructure scantling plans,
- Hull amidships sections

- Superstructure transversal sections
- Shell expansion
- Arrangement of tanks, manholes, plugs
- Bilge and fire fighting system
- Sea water cooling system
- Air vent and sounding pipes
- Scupper system
- Fuel oil system
- Sanitary system (black and grey water system)
- Hot and cold fresh water system
- Accommodation air conditioning and ventilation
- Shafting arrangement
- Steering gear system
- Rudder Construction
- Stabiliser system
- Bow - thruster system
- Engine-room arrangement
- Engine room ventilation
- Wheelhouse arrangement
- Electrical wiring diagrams and cable list
- Electronic wiring diagrams
- Electrical load balance
- Emergency lighting system
- Navigation and communication system
- Monitoring system function list
- General lay-out of electric switch board and distribution panels
- Arrangements of antennas
- Fire Equipment plan
- Mooring arrangement
- Docking plan

All the drawings will be issued with all the units expressed in the International System of Units (metric system)

*I.*12 INSTRUCTION BOOKS

One complete set of the following equipment operating and instruction manuals will be collected by the Builder and supplied to the Owner upon delivery of the Vessel.

Furthermore, any manufacturers' data readily available in electronic format shall be supplied.

Engine Room Equipment
Auxiliary Engineering Equipment
Deck Equipment
Electronic Equipment and Components
Domestic and Commercial Appliances
Safety and Fire-fighting Equipment
Security Systems, Alarm & Monitoring Systems

*I.*13 TESTS AND TRIALS

Before Delivery dock tests will be carried out, the owner shall be notified of these tests in accordance with the sales contract.

All official tests and trials shall be documented. The documentation shall include test and trial methods, length of time, results and corrective action to be taken to rectify any defects or faults. When applicable, the tests and trials documentation will be signed by the surveyor of the classification society.

The following tests and trials will be carried out:

Dock tests:

- Fuel system
- Fire fighting system
- Sea water cooling system
- Cold and hot fresh water system
- Sewage system
- Compressed air system
- Scuppers and drainage system
- Main engines and generators first starting and set-up with certificates
- Engine room ventilation
- Air conditioning and ventilation
- Mooring capstans
- Bow thruster
- Stabilizers set-up

- Cranes operation
- Stern gangway
- Steering gear
- Water maker
- Doors, windows, portholes water tightness
- Alarms and monitoring
- All pumps
- Navigation and communication equipment set-up
- TV, Hi-Fi, AM/FM, entertainment appliances.
- Fire detection system
- Diesel-generators
- Lighting
- Batteries and battery chargers
- Navigation lights
- Dock sound level measurement.
- Hydraulic Hull doors for operation & water tightness
- Dogging mechanism for all hatches & doors

Sea trials:

- Vessel speed (measured by GPS system)
- Engine parameters/speed measurements by engine manufacturer
- Engine controls, alarm and monitoring
- Manoeuvring: Turning circle and Zig-Zag test
- Sound level measurements in navigation
- Windlass test (lifting three lengths of chain from hanging free position)
- Rudder and steering gear test

All costs in connection with the trials will be at the Builder's account. Fuel oil, lubricating oil, hydraulic oil and greases for Builder's account will be bought in consultation with the Owner's representative. After delivery of the vessel, remaining fuel oil and lubricating oil in tanks will be invoiced to the Owner, at prices current at time of trials.

*I.*14 WORKMANSHIP

The workmanship in general, details and finish shall be first class in every respect, and to the best Yacht Building standards in the limits of the following specification.

The workmanship and materials may be inspected by the Owner's representatives.

*I.*15 BRANDS OF EQUIPMENT AND MATERIALS

At Numarine we try to provide high quality brands and materials which are specifically designed for the marine market or of high end household quality. Prior to commencement of build a detailed list of appliances and equipments can be provided to the owners representative for approval, any items requiring change can be done providing they do not impact upon structural requirements or do not comply with regulation requirements of the yacht. Items with cost differences to our standard items may be charged as extras at our discretion and agreement with the owner.

*I.*16 WOOD

All the wood used on board will be of excellent quality. The wood must be sound dry and free from cracks, knots and other defects.

Deck planking will be selected on uniform colour and straight close edge grain free of knots or shakes.

All lacquered, varnished and painted interior surfaces shall have a barrier coat applied to the opposite side of the surface.

*I.*17 PROJECT MANAGEMENT

A Project Manager will be involved by the yard as the primary interface with the Owner.

The yard will communicate the Project Managers name after the contract is signed.

The communication language will be English.

The Owner should appoint one Representative to act on his behalf, co-ordinating the other Owner's consultants involved, and as a communicator with the yard.

The Owner will provide the Representatives name no later than one week after the contract is signed.

*I.*18 ACCEPTANCE AND DELIVERY

Acceptance and delivery terms are part of the sales contract.

II. HULL & SUPERSTRUCTURE

*II.*1 HULL CONSTRUCTION

Hull and decks are built under RINA control and survey.

The hull is divided in watertight compartments designed according to RINA rules.

The hull will have integral tanks for fuel, sludge, fresh water and wastewater.

The bow and stern thrusters are fitted in separate compartments this compartment, can be made watertight if required by class.

The structure consists of transversal and longitudinal stiffeners, such to achieve maximum strength and minimum weight.

The maximum longitudinal spacing is abt 350-450 mm, the transversal framing is 1050mm, with partial interframing for the bottom of engine room, and forward of collision bulkhead.

The thickness of the shell plates varies in consideration of the hydrostatic and hydrodynamic loads. Local increases of thickness are foreseen for the hull structure attachments of: stabilizers, propeller brackets and stern tube passage, and in general where particular stresses are foreseen.

Integrated foundations are foreseen for:
main and auxiliary machines,
rudder and steering gear,
stabilizers,
bow thruster,
stern thruster,
cranes.
etc.

All longitudinal stiffeners, transverse frames and necessary intersections will have limber holes at the lowest points for drainage.

All openings in girders & frames to be collared for increased strength & ease of access if required by the RINA.

Welding, material treatment, quality control, insulation, painting of the hull and superstructure will be made in the best workmanship tradition and according to the requirements of RINA.

*II.*2 QUALITY AND WELDING

The yacht is built in accordance with the highest ship building standards.

The hull plating, the internal transverse bulkheads and all vertical surfaces of the superstructure are to be fair, smooth and free from excessive welding stresses.

The welding works are executed in accordance with the RINA Rules and to the satisfaction of the Surveyor, by certified and experienced welders.

Distortion from thermal stress due to the welding will be limited as far as possible by appropriate construction procedure.

All metallic surfaces to be welded are scraped or gouged to clean bright metal just prior to welding. Upon completion of welding, all welds are chipped free of slag and/or wire brushed clean. Under no circumstances, welding upon painted or rusted surfaces will be accepted.

The hull & decks are double butt welded. All tank end plates and watertight bulkheads are 100% welded on both sides. T-bars, webs, stiffeners, girders, frames and deck beams are all stitch or chain welded above DWL and continuous below DWL.

Brackets and machinery mounts etc. are to be securely welded.

Skeg plate is a combination of slot and continuous welding where applicable.

All welding will be tested with non-destructive methods in accordance with RINA rules.

*II.*3 WATERTIGHT BULKHEADS

Three watertight bulkheads divide the hull in 4 compartments according to RINA rules.

Watertight doors are provided where required.

The watertight bulkhead doors will have sensors and remote monitoring.

Watertight collision bulkhead is positioned in compliance with the RINA requirements.

*II.*4 INTEGRAL TANKS

The sides and baffles of the integral tanks are continuations of the longitudinal girders and transverse frames and are executed in such a way that the contents will run freely to the deepest point.

The tanks are fully accessible through manholes and lightening holes in the internal baffles. The manholes as well as all tank fittings and connections shall be readily accessible at all times.

Tanks shall be fitted with ventilation pipes, connection for supply/return lines, sounding system and alarms according to the sounding plan and as specified in the relevant chapter.

*II.*5 ENGINE FOUNDATIONS

The main engines girders are continued in both the fore and aft direction and form an integral part of the girder system.

The structural arrangements are laid out in a manner allowing good access for tools and hands to perform the necessary installation, maintenance and cleaning work.

*II.*6 ENGINE ROOM FLOORING

Steel angle bar support for aluminium flooring will be provided in Engine Room for walkways. All edges will have up stands around perimeter.

The floor is divided in easy removable sections to access the bilges and the equipments underneath.

*II.*7 MACHINERY FOUNDATIONS

Steel and stainless steel foundations will be provided to support each piece of machinery and equipment and switchboard in Engine and Technical rooms.

*II.*8 AFT COMPARTMENT

The astern compartment accommodates a beach club with bar, lounging area on the platform and undercover also a separate changing room, toilet and shower with technical spaces for the power packs of the steering system, and electrical systems etc.

The platform will be closed by an upward rotation just above water line sealing the beach club and leaving a small working platform for docking as detailed in the GA.

The technical space is intended to accommodate only diesel oil and electric machines.

*II.*9 FOREPEAK

A chain locker of sufficient volume to contain the chains as required by the RINA is provided forward of the watertight collision bulkhead, as part of the forepeak.

Chain hawse pipes are installed from anchor pocket to deck with 3 nozzles in each for chain washing and from deck to chain locker with bell mouth open ends.

The anchor pocket is made of polished stainless steel AISI 316L, bonded and welded to the hull pocket in the steel structure.

The fall into the chain bins allow stowage without the crew needing to lay the chain in.

Deck hatches are provided for access to chain locker compartment. The hatch is fitted with high quality gas rams to open easily and maintain safely in the open position without a locking mechanism.

*II.*10 HULL BULWARK

Continuous bulwark constructed in the same material as the hull with level and width as indicated on the External Profile is provided. The minimum height of the bulwark, including the hand railing, is 1000mm (measured from topside of the finished deck).

Bulwark doors will be provided if requested: one starboard side and one portside.

Holes for freeing ports and fairleads are provided. Fairleads are protected by stainless steel surrounds.

*II.*11 SHAFT BRACKETS

Shaft brackets "A" type are provided. The shape and thickness keep in consideration the number of propeller blades and propeller revolutions to avoid structural resonance.

Shaft brackets are constructed of steel, welded to the hull.

Shaft brackets scantling will be in accordance with RINA rules.

*II.*12 SEA STRAINERS

In the engine room, two main interconnected sea strainers are bolted into steel tubes welded into the hull bottom, fitted with a single suction each and with properly sized grills, all main equipment suctions are taken from the interconnection tube.

A further sea strainer is fitted in the engine room for air-conditioning cooling and water maker suctions.

*II.*13 CATHODIC PROTECTION

An anodes plan has been defined by Numarine in agreement with MG Duff the anodes supplier to protect the hull and appendages from galvanic corrosion. A minimum 2 year of protection was detailed in the design using aluminium anodes. Shore power connection will be fitted with an isolation transformer isolating the grounding system when in port.

*II.*14 SCUPPER BOXES

Scupper boxes will be provided in accordance with RINA Pleasure class rules to assure complete water drainage and discharge from all weather decks.

Scupper box will be welded in place on the exterior for water tight integrity and have removable stainless steel grills to prevent debris from entering into the deck drain piping system.

*II.*15 HULL PORTHOLES AND WINDOW FRAMES

All lower cabins including crew area will have stainless steel openable type port lights with open sensors displaying at the helm, these are tested and approved by RINA. Where required deadlights will be an integral part of the port light.

Master cabin hull glass is tempered and laminated with polycarbonate type bonded glass, tested and approved by RINA with one openable port light section per side.

Saloon and Owners cabin glass is tempered type bonded glass, tested and approved by RINA with certified electric drop windows as detailed in the GA.

Wheelhouse glass is tempered bonded glass tested and approved by RINA.

*II.*16 SUPERSTRUCTURE CONSTRUCTIONS

Saloon superstructure and owners cabin levels are constructed from FRP and PVC foam sandwich with vinylester resin and gelcoat finished. Design scantlings are approved by RINA.

Master cabin area is continued as steel from the hull and meets the same standards as the hull.

*II.*17 SUPERSTRUCTURE BULWARKS

Continuous bulwark at different level and width, as indicated on the External Profile are provided.

Deck level bulwarks are continued as steel from the hull and meet the same standards as the hull.

Higher levels are constructed from FRP and PVC foam sandwich with vinylester resin and gelcoat finished. Design scantlings are approved by RINA.

*II.*18 STAIRCASES

All internal staircases between main and lower deck are fully constructed of the same material as the hull, for the purpose of safety and noise reduction.

The staircases above the main deck will be design features constructed from glass unless otherwise requested by the customer.

External steps will be teak covered steel or FRP depending on location. Deck openings will be protected at sides with stainless steel hand railing on stainless steel stanchions.
Position and size as shown on General Arrangement.

*II.*19 OUTFITTING RECESSES

Into the superstructure, suitable recessed boxes will be built for: fire hydrants, deck wash-down sockets, filling stations etc.

*II.*20 MASTS

The main mast design will include platforms and other adequate supports for navigation and communication antennas and radar domes, navigation, anchor and signalling lights etc.

The definitive drawing including the positioning of all the communication, navigation and TV antennas and radar domes will be finalised depending on any specific requirements by the customer.

The mast is fitted to hold the navigation lights in compliance with the COLREG Rules.

III. PROPULSION & MANOEUVRING

*III.*1 GENERAL

The yachts concept is to provide for long distance travelling with the highest comfort levels, our hull is designed to be soft in ride while being extremely seaworthy. Noise and vibration levels having been studied by Van Cappellen consultants with full FEA analyses to comply with or exceed RINA "Comfort Class" certification.

*III.*2 MAIN ENGINES & GEARBOXES

Two CAT C18 715bhp Tier 3 rated turbo charged & after-cooled four stroke diesel engines with coupled ZF 665A reversing gearboxes installed on bespoke flexible mountings to eliminate vibrations.

The main engines have an electronic controlled automatic synchronisation system.

The design and installation of all services relative to the main engines shall be in accordance to the engine manufacturer installation specifications.

The engines will be equipped with all necessary manufacturer's supplied accessories, such as heat exchangers, sea-water pumps, duplex fuel filters, fuel injection pump electric starting system etc and in accordance with RINA Pleasure Class rules.

Electronic engine controls will be engine manufacturer's supply. Local emergency control in the Engine Room, main station in wheelhouse and on Flybridge, manoeuvring station at port side of cockpit.

*III.*3 FLEXIBLE COUPLINGS

With flexibly mounted engines and gearboxes the drive chain is connected via a Centa (highly flexible) couplings providing complete isolation of engines and gearboxes from the yachts structure.

Alignment of the gearbox and main engine to coupling installation will be in accordance with maker's recommendation with regard to radial and axial tolerances.

*III.*4 SHAFTS

Engine power is transmitted to propellers by mean of single section, F51 (4462) Duplex stainless steel shafts.

Shafts diameter is in compliance with RINA Pleasure Class requirements.

Stern tubes of steel with type approved Orkot, Thordon or Duramax etc bearings and Tides marine dripless seals.

TVA calculations of the transmission train from engine to propeller will be provided by the manufacturer if requested by the Classification Society.

*III.*5 PROPELLERS

Vessel is provided with two five blades, fixed pitch propellers.

Propellers material Aluminium Bronze.

The propellers will have skewed blades, designed for high efficiency and low noise, tip clearance to hull is also considered during design.

The propellers will mount on tapered shaft end with key connection to shaft.

Propellers will be balanced and will have a surface finishing to 2 micrometers Ra and inspected in accordance with ISO 484 class 1.

*III.*6 RUDDERS & STEERING GEAR

Two balanced spade rudders are fitted. Rudder is made of cast Aluminium Bronze.

Rudder stock diameter is in accordance to RINA Pleasure class requirements.

Bearing material is type approved Orkot, Thordon or Duramax etc or equivalent.

Steering gear system maker DATA Hydraulic (or equivalent) is fitted.

The steering gear system is of an electro-hydraulic type, capable of being operated in the following manners;

Control is by the wheel or the joystick located at the main helm and Flybridge helm or joystick at the third station (electrical system) or from the emergency station in the technical space port side (manual pump type)

Autopilot (see relevant chapter)

Emergency control: should a failure of the main control stations (both wheel and joystick) occur the rudder control can be made by the manual pump unit at the emergency station in the port side technical space.

One hydraulic power pack is provided with 380v and 24v electric pumps 1.5Kw each and an oil tank equipped with filters, solenoid valves, relief valve, oil pressure and level gauges and a tank low level alarm in accordance with RINA Pleasure Class requirements.

Twin hydraulic actuator will be fitted, transmitting thrust to both rudders linked with a tie bar, tillers are provided with mechanical stoppers limiting the rudder angle to 35° (stb and prt).

Rudder angle indicators are provided in wheelhouse, Flybridge helm, third station and emergency steering position.

*III.*7 BOW THRUSTER

The system is of an integrated, electro-hydraulic type. The 45Kw bow thruster is driven by a hydraulic piston motor, and fitted with two counter rotating fixed-blade type propellers in a tunnel providing 600Kg of thrust, tunnel diameter abt 450 mm.

Bow thruster and windlasses/winches are fed at sea by gearbox driven power-take-off pumps from both engines in conjunction with an 21.2Kw electric pump installed in the main tank. In case of engine failure or in-port operation when engines are not running the electrically driven hydraulic pump will feed the system.

The hydraulic power pack is cooled by the cooling water exiting the gearbox before discharging overboard, normal operation is from the port engine but emergency crossover from starboard engine is also provided.

Dual thruster joystick controls will allow operation of thrust direction and speed from wheelhouse, flybridge and cockpit stations.

Bow thruster compartment can be made watertight when required by RINA Pleasure Class.

*III.*8 STERN THRUSTER

A hydraulic stern thruster is installed in the skeg, it is a tunnel type installed just forward of the propellers. It is fed from the main hydraulic system for bow thruster and windlasses. Dual joystick controls are fitted at all helm stations.

Stern thruster compartment is made watertight for additional security.

*III.*9 STABILIZERS

The stabilizer system will be of the electric type from CMC stabilizers.

This provides the following benefits over hydraulic systems;

- Significant reduction of the absorbed power
- Weight and dimensions reduction
- Higher system reliability
- Noisiness reduction in particular on anchor mode

Blades are constructed from reinforced fibreglass with an internal stainless steel structure. Blade area will be abt 1.60m^2

Stabilizer blades will be fitted in the optimal position providing maximum stabilisation and in accordance with manufacturer's recommendations and RINA Pleasure Class rules.

IV. PIPING SYSTEMS & RELATED MACHINERY

*IV.*1 BILGE SYSTEM

Watertight compartments (except forward of collision bulkhead) have dedicated bilge suction lines leading to the central manifold and connected to it through electrically actuated valves.

The manifold is served by an electric self-priming pump, in parallel with the main fire pump. Cross over connections are provided encase of pump failure to the fire system.

Each bilge well is fitted with dedicated bilge alarm.

One emergency bilge (and fire), motor driven, self-priming pump is fitted outside of Engine Room in the forepeak. The pump discharges the exhaust gasses through the chain hawsepipe.

Independent flexible bilge suction line is provided for engine bilge cleaning and pumped to the sludge tank, can be discharged by dedicated shore connection or by its own pump into containers for later disposal.

All bilge suctions will be fitted with a foot valve and strainer.

Bilge system piping is of varying materials all complying and inspected in accordance with RINA regulations.

*IV.*2 FIRE SYSTEM

The system is driven by a main fire pump in parallel with the main bilge pump. The main pump is installed in engine room and is connected to the Cunifer (CuNiFe) fire main manifold. Cross over connections are provided encase of pump failure to the bilge system.

The emergency bilge motor pump (see previous chapter) works also as emergency fire pump, feeding the main Cunifer (CuNiFe) fire system by a dedicated sea intake in proximity of the pump in the bow.

The Cunifer (CuNiFe) fire main manifold will supply water to 4 fire hydrants onboard as per RINA regulation: the locations are, upper deck stbd forward, upper deck stbd aft, main deck port amidships and main deck port aft. These locations are defined on the relevant system drawing and allow access to all areas of the vessel in accordance with and approved by RINA.

*IV.*3 BALLAST SYSTEM

There is no dedicated ballast system onboard but with twin water tanks aft and various fuel tanks liquids can be loaded in such a way to ballast the yacht if required.

*IV.*4 FUEL FILLING, TRANSFER, SERVICE AND OVERFLOW SYSTEM

The transfer and filling system includes the low-pressure piping required for filling the tanks and for the transfer of fuel from one storage tank to the day service tanks for immediate use or another storage tank when necessary for trimming the ship.

Hidden filling stations (main deck both side) with hard connection quick release fittings for quicker fuelling.

Gravity filling pipes lead to the transfer main valve manifold. From the main valve box manifold it is possible to deliver to or to suck from each fuel tank by mean of the transfer pumps. One 380v AC electrical pump and one 24v DC electrical backup pump are provided.

The diesel oil carried in the storage tanks can also be transferred through a centrifugal purifier type Alfa Laval MIB 303 to the day service tanks or to another storage tank or returned to the same tank.

From the day service tank crossover pipe, fuel is delivered to the engines and generators through appropriate filters.

Each diesel oil storage and daily tanks are connected to the overflow pipe which leads to the overflow tank. The overflow tank has a ventilation pipe with cross section area suitably dimensioned in function of embarkation line, and leading to the filling stations via a high loop to prevent water ingress or spillage.

Fuel system piping is in accordance with RINA regulations.

*IV.*5 VENTING AND SOUNDING SYSTEM

Venting is provided for each tank according to RINA Pleasure Class requirements. Fuel tanks are vented by the overflow pipes (see previous chapter). Overflow tank is vented by pipes leading to the two filling stations.

Black water and gray water tank has venting pipe leading to the hull side with appropriate carbon filter.

Fresh water tanks have vent pipe leading to the port side capstan foot switch recess.

An electrical sounding system, is fitted as per following table:

Sounding Types;

- **Diesel Oil storage tanks** WIKA Lloyds approved pressure sensor with WIMA back-up float type sensor.
- **Diesel Oil day service tanks** AYVAZ magnetic level tube with electronic sender, both visual and connected to central data system.
- **Fresh water tanks** WIKA Lloyds approved pressure sensor
- **Black and grey water tank** WIKA Lloyds approved pressure sensor.

*IV.*6 LUBRICATING OIL SYSTEM

As standard there is no provision for oil storage either clean or dirty.

IV.7 SEA WATER COOLING SYSTEM

Seawater supply to main engines and diesel generators is provided by two sea strainers connected to a crossover line. The crossover line supplies main engines, generators, treatment plant etc.

The cooling water going out from the main engines is used to cool the reduction/reverse gears, the shaft seals and main engines exhausts, plus the hydraulic system cooling.

The main fire pump is also fed by from this crossover line.

The auxiliary sea strainer is supplying the air-conditioning system and water makers.

*IV.*8 MAIN ENGINES EXHAUST SYSTEM

Main engines exhaust gas is discharged overboard through wet type exhaust mufflers below waterline.

On the connection between the engine and the duct flanged compensators are fitted in order to absorb thermal elongations of the line. Exhaust bypass gas is also muffled before passing through the hull just above waterline.

Since submersed exhaust will work mostly at high speeds the bypass exhaust is provided for the low rpm cruising speeds. An electronic speed controlled butterfly valve is installed for the purpose of closing the bypass exhaust at higher RPM.

As per RINA Pleasure Class requirement, a butterfly valve is installed on the main exhaust underwater branch too.

The support of the main engine exhaust system is fully flexible with compensator connection to the turbo of the engine with a flexible connection to the muffler, the system is supported from a framing to the yachts structure with high volume mounts to isolate noise and vibration. Connection of cooling water pipes is made with flexible hoses.

All exhaust gas piping will be appropriately insulated with suitable ceramic wool materials and covered with polished stainless steel laminate.

Dry exhaust piping and water-cooled exhaust piping are in stainless steel.

*IV.*9 DIESEL GENERATORS EXHAUST SYSTEM

The generators exhaust lines are of the wet gas type, and are fitted with silencer (muffler type) and water separator boxes, then exhaust gas and cooling water are separately discharged overboard, the gas discharge line has an additional muffler installed for quite running.

*IV.*10 FRESH WATER SYSTEM

Fresh water storage tanks can be filled by the filling station on main port side, by the pressure line plug in the port steps and by the water makers.

The fresh water system is equipped with silver ion sterilisation and water softening which connects in different ways depending on the source of the water, see detailed system drawing for further information.

Twin water makers are also installed in the Engine Room.

There are 2 independent water pumps feeding the systems on the yacht with cross over in case of single pump failure, pump 1 feeds crew accommodation and deck systems, pump 2 feeds main galley and accommodation systems. Pumps are fitted with pressure control and are fully automatic. Shore input socket can be used to bypass the pumps and also fill the tanks directly.

The hot water system is also split between crew and guest having separate lines with cross over in case of boiler problem. Water is circulated around both systems by pumps to provide instant hot water.

Boilers 1x 200 litres and 1x 150litres, 2 kW each are provided.

Cold and hot water lines throughout the boat are in Aquatherm PP-R or Speedfit PEX piping.

A cold water wash down system, connected to the crew fresh water system is supplied with outlets on each deck level located inside the fire boxes and on the Flybridge in the starboard wet bar, cockpit has one in the portside wetbar and the beach area has a connection in portside seating.

Wheelhouse screens have washer jets on wiper blades controlled by electric valve.

*IV.*11 SEWAGE AND SANITARY SYSTEM

The toilets are silent flush fresh water type; each toilet is independently connected to the main Geberit sewage line which discharges into the black water holding tank directly. The black water tank has 3 discharge options, through the onboard sewage treatment system which can be set to automatic working, through the deck dockside discharge when in port or for emergency when permitted a direct through hull discharge to sea option. *(This discharge valve should remain closed at all times unless it is essential to use, illegal discharge of sewage into the sea is a serious subject in maritime law and can lead to prosecution)*

A grey water tank is provided for collecting waste water from showers, washing machines and galley discharges with dedicated pump to transfer into the black water tank, discharge options are then as detailed above. Galley will discharge through a grease trap.

*IV.*12 ENGINE ROOM FIRE EXTINGUISHING SYSTEM

A fixed fire extinguishing system is installed in accordance with RINA regulations, the system is a FM200 gas system with the cylinder installed into the starboard side technical space and piped to a distribution nozzle in the engine room.
A release handle situated by the main helm stbd side with fire panel activates the system and shuts down all required equipments and air ducts to allow the effective extinguishment of the fire. All fuel suction lines are also automatically closed by this system.

*IV.*13 COMPRESSED AIR SYSTEM

No compressed air system is installed as standard, if required a full specification of requirements should be provided so we may install as an option. Additional regulation requirements are required for fixed compressed air cylinders.

*IV.*14 SCUPPERS AND DRAINAGE

A scupper and drainage system is provided to collect and discharge overboard the wash down and rainwater from decks. Scuppers are protected by a stainless steel or teak grills depending on location. Pipes of Geberit above main deck and of stainless steel under main deck are installed.

*IV.*15 HYDRAULIC SYSTEMS

There is one main hydraulic system supplying the windlasses, winches, bow and stern thruster system onboard, this system is powered from the main engines by 2 PTO pumps, one installed on each gearbox, there is also a 21.2Kw electric motor driven pump working in tandem with the engine driven pumps to provide full capacity at low rpm and as a back-up pump in case of emergency or when in harbour and you do not wish to run engines.

Additionally there are 3 independent ancillary systems, steering, garage door, crane and passerelle. *(See relevant section for more details on steering system).* These systems are located as close as practical to the operating motors.

High pressure stainless steel hydraulic piping is installed through the main service tunnel to supply forward hydraulic systems. Flexible sections of high pressure hydraulic hose are used to isolate rigid tube from pump and consumer units minimising the transfer of noise into the structure.

*IV.*16 INSULATION OF PIPELINES

Hot water pipes and air conditioning chilled water pipes are of Aquatherm type with high thermal resistance and additionally are thermally insulated with suitable thickness of Armaflex or equivalent.

*IV.*17 PIPE WORK

All pipework installations are installed free from stress on joints and secured in accordance with RINA recommendations, all pipe passages through normal structure are protected from chafing, passages through watertight bulkheads are spaced and sealed in accordance with RINA requirements for fire and water tightness.

*IV.*18 PIPE LABELLING

All valves are clearly identified in English by labels. Valve position are indicated along with flow directions. Colour coding is used to help identify contents of pipes, see relevant drawing for full details.

V. ELECTRICAL SYSTEM AND ELECTRONICS

Numarine has a comprehensive equipment list in entertainments and navigation as standard, should you wish to enhance this further to match personal requirements it can be discussed during your selection process, values exceeding our standard will be calculated and added as an extra to the contract.

*V.*1 GENERAL

The vessel electrical system is designed according to RINA Pleasure Class Rules, and it complies with IEC Publications 60092-507 2015 – Electrical Installations on Ships or equivalent national ones, even if not limited to them:

The design, construction and installation of all electrical equipment are made for marine service conditions.

The electrical power distribution on board is 380V, three phases, 50 Hz, distributed by a 5 wires system with insulated neutral to individual local distribution boxes allowing the single phase 230 V, 50 Hz, equipments to work using one phase and the neutral. Each consumer has its own dedicated circuit breaker and all earthing cables are returned to the central earthing point in the technical space main AC distribution point.

24Vdc users are fed from a gel battery bank via suitable switchgear and circuit breakers to local distribution boxes in each area where spilt to each consumer via circuit breakers. Main high power machinery is fed directly from primary distribution box via fuses.

A main 380Vac switchboard collects power from the various sources and transfers to a split bus system with transfer switches, this system can provide power options in the following formats;

- Shore power to whole boat
- Shore power to Bus A and generator 2 or 3 power to Bus B
- Generator 1 or 2 or 3 power to whole boat
- Generator 1 to Bus A and Generator 2 or 3 to Bus B

All electrical devices, and their connection/junction boxes, will be installed in easily reachable positions for maintenance purpose and duly protected against any electrical, electrostatic and mechanical possible damages, as well as against contact with water, oil, fuel or heat sources.

All the electrical devices exposed to weather are watertight type, with a protection degree of at least IP65, or higher according to the place of installation.

All cable penetrations through bulkheads or decks will comply at least with their Water tightness' and/or fire division requirements.

All the metal enclosures containing electrical equipments will be duly connected to ground.

There is an inverter system onboard for the supply of AC refrigeration equipments; it has an auto switch so in case of loss of all AC power it will supply the refrigeration from the main service battery bank.

The yacht is also fitted with a lightening conductor in accordance with RINA requirements, mounted on the highest point of the mast and connected directly to the hull plating.

*V.*2 ELECTRICAL POWER GENERATION

The electrical system is fed by a single shore supply detailed below or two main diesel generators, power 65 KW, 380V 3 phase, 50 Hz, and by a night/harbour generator, power 27 KW, 380V 3 phase, 50 Hz.

The generators are fitted with sound enclosure and additional resilient mounts to isolate them from the main structure. Generator exhaust systems have additional gas mufflers allowing almost silent running.

The shore supply is a single 380v 3 phase, 125A supply with Glendenning auto cable recovery system fitted. It has an isolation transformer before connecting to the main switchboard.

*V.*3 EMERGENCY SOURCE OF POWER

The emergency source of power is supplied by a dedicated battery bank fitted inside the ceiling of the wheelhouse at a high position in accordance with RINA regulations.

The emergency switchgear services will be those clearly stated by the Rules, but will be at least the following:

- Emergency lighting
- Navigation Lights
- Bilge suctions electric valves
- Fire system and fire shutdown systems
- SSB, GPS and single navigation screen

The VHF systems shall be fed by a dedicated battery bank as per RINA regulation and situated above the wheelhouse ceiling.

The emergency fire/bilge pump is motor driven.

*V.*4 POWER CONSUMPTION AND SAFETY

V.4.1 Electrical loads analysis

An electrical load annalists has been undertaken for the various operating scenarios onboard the vessel. This is also RINA approved. As with all complex electrical systems user variation will occur so Numarine try to predict the average user type to calculate this load balance.

V.4.2 Protective and safety devices

The protective and safety devices installed on the electrical system are as listed here below:

- Main generators: Long delay overload/over current protection with generator circuit breaker tripping.
  Short delay selective over current protection with generator circuit breaker tripping.
  Instantaneous over current protection for direct short circuit fault with generator circuit breaker tripping.
  Under voltage and overvoltage protection with generator circuit breaker tripping. Also under voltage release on heavy consuming appliances in main distribution.

- Frequency out of range protection
  Alarm signalisation of load over the 85% and overload over 105%

- Shore supply:
  Long delay overload/over current protection with circuit breaker tripping.
  Instantaneous over current protection for direct short circuit fault with circuit breaker tripping.
  Under voltage and overvoltage protection with circuit breaker tripping.
  Alarm signalisation of load over the 85% and overload over 105%.

The generators and the shore supply feeds on the main switchboard will be protected by automatic circuit breakers, electrically operated and complete with electronic type protective relays and low voltage release.

All feeds derived from the main switchgear and from any sub-distribution panel will be individually protected by automatic thermo magnetic type circuit breakers.

Fuses and/or automatic circuit breakers are used for the protection of the control circuitry of any electrical device and/or switchboard.

V.4.3 Main 380/230Vac, 50HZ switchboard

The switchboard will be front opening type with hinged doors and all internal components will be installed for an easy maintenance from the switchgear front.

Spare circuit breakers will be included.

All the conductors will be permanently marked according to the relevant schematics; the bus-bars will be made with pure electrolytic copper solid bars and their dimensioning will be to complying regulations.

All supply fuses and circuit breakers are clearly labelled for their function.

V.4.4 24Vdc emergency switchboard

Main control of the emergency supply is at the wheelhouse control panel, there is a manual changeover switch re-routing power form service batteries to emergency batteries for the required circuits. Local control of wheelhouse equipment is in the main helm panel and local control of engine room emergency systems is in the port side technical space. When power is switched at the helm both control locations will receive power form the emergency batteries.

V.4.5 Locations of the Load distribution AC/DC

The location of load distribution AC and DC, is as follows:

- Main AC Load centre # 1 : Port side technical space
- Main DC Load centre # 2 : Engine room
- Load centre # 3 : Galley
- Load centre # 4 : Accommodation lower passage
- Load centre # 5 : Crew
- Load centre # 6: Master Cabin
- Load centre # 7: Wheelhouse

*V.*5 ELECTRICAL CABLES

All electrical power supply cables are in accordance with IEC Publications 60092-507 2015 – Electrical Installations on Ships requirements.

RF, data and communication cables will be detailed by equipment suppliers and to the highest standards available at time of construction.

All cable installations are secured in accordance with relevant standards and protected from chafing where passing through glands in the yacht construction. Generally cables are laid into cable trays supporting their full weight over their entire length.

*V.*6 BATTERY SYSTEM

Service batteries are 2V 1000Ah gel type, maintenance free, deep cycle, installed in the engine room.

The main engines starting batteries are 12v AGM type combined to deliver 24v and dedicated to this service.

The diesel generators starting batteries are 12v AGM type combined to deliver 24v and dedicated to this service.

There is a manually operated cross-over system to support starting of main engines or generators form any or all batter banks in case of emergency.

The radio battery bank is 12v gel type and is located in the wheelhouse ceiling, sizing will exceed the minimum 3 hours supply to all connected equipment required in the RINA rules.

All battery banks have status indication at the helm.

V.7 POWER CONVERSION EQUIPMENT

A detailed list of all electrical equipment is located at the rear of this specification.

The inverter supply is dedicated to refrigeration equipments to ensure no loss of power during AC blackout times, it is fully automatic and will run until service batteries can no longer support the requirements.

*V.*8 YACHT MONITORING SYSTEM

There is a PLC controlled monitoring system installed aboard, it has 3 display stations located in the wheelhouse, crew quarters and technical space. It is an integral part of the electrical system.

All tanks, electric supplies, door condition, port lights, bilge areas etc are monitored and reported to these screens.

In addition to this there is a Touchpad interface for the captain allowing portable monitoring of the same systems.

Full details of this system are found in the owner's manual.

*V.*9 LIGHTING SYSTEM

V.9.1 General

General lighting design is to provide a high class but subtle lighting in all areas, intensity is decided depending to area usage.

All main fixed DC lighting will be LED type either concealed or exposed, feature lighting will be AC 230v and only available when an AC source is available.

All 24v DC lighting is supplied from the main service batteries.

All areas have automatic 24v emergency lighting, more details in relevant section.

V.9.2 Guest Internal Areas

All cabin lighting is a combination of 24V DC and 230v AC lighting, main cabin lighting is concealed 24v LED, also bed head concealed LED lighting and accent LED lighting around bed bases and in window recesses. Wall or unit mounted feature lights will be 230v AC type.

Dining area has a combination of concealed 24v LED and 24v LED illuminated wall panels with an overhead feature hanging 230v AC light.

Saloon area has 24v concealed LED overhead lighting with some 24v exposed LED lights, 24v LED window and low level accent lighting and 230v AC standing and mounted feature lighting.

Final lighting decisions will be discussed before project commencement.

V.9.3 Crew quarters

All area lighting is of the exposed 24v LED lighting type. Captain's cabin also has 230v AC desk lighting.

Lighting design in this area is Numarine standard configuration.

V.9.4 Exterior lighting

All exterior lighting is 24v DC type.

Cockpit area overhead will have 2 banks of LED exposed lights; low level LED accent lighting for walk ways is also provided.

All steps are illuminated with LED strip lighting concealed in step nosing's.

Side walk ways overhead will have LED exposed lights and low level LED accent lighting in walkway.

Owner deck has accent LED lights around bulwarks and LED illuminated arms to the extendable canopy, exposed LED lights in overhang outside patio door. This area also has LED flood light for working on the deck level.

Fore deck area has low level LED accent lighting and LED flood light for working area.

Flybridge has low level LED accent lighting around outside edges with overhead LED exposed lights in underside of roll bar.

Lighting design in this area is Numarine standard configuration.

6 underwater lights are fitted, 4 on the transom and 2 on the aft sides.

V.9.5 Machinery and technical spaces

24v DC IP65 LED lighting is supplied in all technical spaces and bilge areas.

In addition to this the engine room is equipped with 230v IP65 AC LED lighting providing a high light intensity for safe working.

V.9.6 Emergency lighting

The emergency lighting system is automatically activated on loss of service battery supply, service batteries are monitored and should failure occur then the emergency light will be illuminated.

Light location are in every escape route, doorway or stairs showing possible options for escape, lighting will only be visible in direction of escape also. Lighting is also provided at emergency steering and pumping stations.

The system will not be affected by normal operations of the batteries onboard or by the AC electrical system.

V.9.7 Navigation and signal lights

Navigation lights will conform to the International Regulation IMO COLREG 72 and carry RINA approval, lights are 24v DC LED type conform to these Rules for lights locations.

Navigation lights will be fed by their dedicated distribution panel according to the RINA rules, and are fitted with the prescribed indication in accordance with these rules.

*V.*10 ELECTRONICS

V.10.1 General

The vessel shall be fitted with the following:

- Navigation equipments,
- GMDSS communication antenna and equipments
- Internal telephone system
- Loudhailer.
- Data network system.

The systems are designed in accordance with manufacturer's recommendations and under their consultation; specific brands will be confirmed with the customer before final design is completed.

V.10.2 Navigation equipment

The following equipment will be installed as Numarine standard; any required variations should be requested during the design stage;

- Main radar-
- Second radar-
- Fly helm screens-
- Wheelhouse screens-
- Autopilot system-
- Depth/Log indicator-
- Navtex-

V.10.3 Communication Equipment

GMDSS rules shall be used as guidance for the communication system installation.

The following equipment will be installed as Numarine standard; any required variations should be requested during the design stage;

- VHF- Raymarine
- SSB or INMARSAT Sailor FB150

V.10.4 Internal telephones system (PABX)

A PABX exchange is installed for cabin to cabin and whole boat communication including headphone system inside the engine room. This can be connected to the onboard Locomarine wifi and 4G long range system if requested for external phone usage depending on sim card choice.

V.10.5 Loudhailer

A loudhailer connected to the VHF is supplied for external alarms and communications on deck.

V.10.6 Data network system

There are 2 separate data networks onboard, the first network is for the sole use of the monitoring system and internal yacht systems, this must remain independent to the other data system and should not be linked to the internet to maintain security onboard of all systems.

The second system is a Locomarine high power WiFi and 4G system providing long range connections to shore based WiFi or to the global 4G network, range varies depending on many conditions but can be available up to 20Nm offshore when conditions are favourable. Data speed and connection type will depend on your 4G provider which is not part of Numarine supply.

The internal distribution around the yacht is via WiFi but hard wire connections can be provided by request.

*V.*11 ENTERTAINMENT SYSTEM

Details of specific equipment are provided in each area detail in section IX Interior.

General entertainment principal is to provide a main saloon system capable of distribution in the saloon, cockpit, Beach, Flybridge and fore deck areas. In addition to this the cabins will have stand alone TV and music options. Owners cabin also will distribute music to the owner deck exterior level.

Details supplied in section IX are Numarine standard supply but if there is a specific requirement this should be discussed during design stage and can be included as an option.

A 90cm Satellite dome is fitted as standard.

*V.*12 CCTV CAMERA SYSTEM

CCTV is supplied from 6 cameras and connected to the Navigation system for safety at sea, cameras are located on the aft deck, engine room, side decks and a docking camera.

If a full security system is required please request this during design stage as an option.

*V.*13 MAIN ENGINES AND STEERING CONTROLS

Control stations will be in the Wheelhouse, Flybridge and third station. As guide line the following controls will be fitted into each control station:

V.13.1 Wheelhouse main station

Steering wheel
Bow & Stern thruster control lever (speed and direction)
Horn control
Main engines throttles, electronically controlled
Main engines monitoring panels, with instrumentation supplied by the manufacturer
Engines emergency stop push button
Rudder angle indicator
Main engines r.p.m.
Main generators remote control panel
Windlass controls
Communication systems as stated in relevant chapter
As previously stated some indications and control functions will be concentrated into the touch screen displays of the monitoring system.

V.13.2 Flybridge station

Steering wheel
Bow & Stern thruster control lever (speed and direction)
Horn control
Main engines throttles, electronically controlled
Main engines monitoring panels, with instrumentation supplied by the manufacturer
Engines emergency stop push button

Rudder angle indicator
Main engines r.p.m.
Main generators remote control panel
Windlass controls
Communication systems as stated in relevant chapter
As previously stated some indications and control functions will be concentrated into the touch screen displays of the monitoring system.

V.13.3 Third station control

Bow & Stern thruster control lever (speed and direction)
Horn control push button
Main engines throttles, electronically controlled
Engines emergency stop push button
Steering joystick control and rudder indicator
Windlass controls
Passerelle control
Garage Door control

*V.*14 VESSEL GENERAL ALARM

General alarm will be means of the horn fitted to the yacht unless class or flag requires alternative means of alarm.

*V.*15 FIRE ALARM SYSTEM

Master control station, to be placed into the wheelhouse, with sufficient number of detectors loops (addressable type), alarm digital display, internal UPS backup system, lines fault monitoring, alarms and signalisations as required by RINA Rules.

Optical smoke fire detectors, addressable type, to be installed in all interior rooms and spaces, and in all technical spaces in accordance with RINA requirements.

Thermal type fire detectors, addressable type, to be installed in the galley as well as in the engine room, and everywhere else required by the Rules.

Manual alarms, Break-glass type, addressable, as required all around the vessel.

The engine room alarm signal will also activate distinctive flashing light as prescribed by RINA.

VI. OUTFITTING

*VI.*1 TEAK DECKS COVERING

Exterior decks to be planked with best grade of teak, of 10 mm finished thickness epoxy backed and epoxy bonded.

The deck is pre-manufactured in sections with planking joints in Sika DC deck corking and laminated on the back with epoxy and CSM.

Deck areas are levelled with epoxy paste and faired before application of teak sections; teak is applied with vacuum technology to ensure even pressure to whole surface during bonding process.

This layout ensures the maximum stability of teak to temperature variations, and the best watertight bonding.

All the external stairways will have the steps covered with teak to the full width from wall to wall & forward to the overhang the riser.

*VI.*2 OUTSIDE HANDRAILS

Polished stainless steel handrails made of 38mm pipes will be fit to staircases and elsewhere as required. Bulwark top rail and Flybridge surround rails in 100mm wide teak on 38mm stainless steel supports.

*VI.*3 WINDLASSES

Two vertical "DATA" Hydraulic windlasses are provided at the bow. They are controlled from each helm station and at the bow with cable handsets. They are fed from the main central hydraulic system located in the engine room.

*VI.*4 CHAIN ROLLERS AND STOPPERS, CHAIN LOCKER

Stainless steel chain rollers are fitted in order to prevent excessive friction at the upper end of the hawse pipe; stainless steel stoppers and devil's claws are installed to hold the anchor in position against the anchor pocket.

The two chain lockers will be lined with rubber to protect the hull against damage by chains and to reduce chain loading noise.

*VI.*5 ANCHORS AND CHAINS

Two 230Kg HHP (High Holding Power) anchors in accordance with the RINA requirements, in Stainless Steel. Chains: 2 x 14m grade U2 galvanised high tensile steel stud link chain one of 180m and second of 150m long.

*VI.*6 CAPSTANS

Two reversible capstans are fitted on the aft deck with hydraulic motor below deck. They are driven from the main hydraulic system in the engine room.

Each capstan is foot operated by recess mounted switches. Drums of polished stainless steel, shaft in stainless steel.

Positions as per mooring arrangement.

VI.7 MOORING BOLLARDS.

Polished stainless steel twin post Bollards in AISI 316, 4 on fore deck, 4 on aft deck, welded to main deck plating. Two additional bollards for springs used for alongside mooring operations fitted amidships, one per each side.

*VI.*8 HULL PORT LIGHTS

Size and position as shown on profile drawing. Each port light is fitted with integral deadlights which hinge up when not in use.

*VI.*9 BULWARK DOORS

Hinged doors are provided in the lowered glass bulwark sections on both sides.
Doors will have stainless steel hinges, closing dogs and means of securing in open position.

*VI.*10 SIDE HINGED DOORS

All superstructure side external doors are of steel construction. The doors will be weather tight. The size and position are indicated on the General Arrangement drawing.

All doors will be securable in the open position.

There is door open monitoring at the helm.

*VI.*11 SLIDING DOORS

Manual sliding doors are installed at the aft of the saloon and owners cabin, doors are of stainless steel AISI 316 construction with 10mm tempered glass to comply with RINA regulations. Sliding sections are lockable at different stages

There is door open monitoring at the helm.

*VI.*12 AFT BEACH DOOR

The beach door is a watertight type door and operated independently from its own hydraulic system with manual override, the door has mechanical locking dog's spaced around the edge in compliance with RINA regulations.

When open the door creates a teak covered beach area open to the beach club, see relevant section in IX for more information.

There is door open monitoring at the helm.

*VI.*13 TENDER CRANE

A Besenzoni 2500Kg Electric/hydraulic, heavy duty, extendable up/down, boat crane will be fitted to the upper deck level as shown in the GA.

Its reach allows the loading of both the large and small tenders to and from the upper deck independently.

*VI.*14 BOARDING LADDER

One swimming pool type manual bathing ladder will be provided to fit into the starboard side fixed transom step. This ladder will have dedicated storage in the beach club area.

*VI.*15 STERN GANGWAY

A Besenzoni hydraulic telescopic type gangway is fitted to the port aft side.

The gangway is stainless steel with removable handrail and stanchions of polished stainless steel AISI 316. It has teak planks on the walking surface with illumination.

*VI.*16 SHIP'S NAME

Name & port of registry in stainless steel AISI 316 polished and fitted to the aft door.

Although illuminated names are possible we do not recommend them due to the opening beach door and the names proximity to the water when open.

*VI.*17 WINDOWS

All windows are of the bonded glass type, the frame is an integral part of the structure and the glass is bonded using the certified Sika glass bonding system. All glass in the hull is of the thermally tempered and polycarbonate laminated type tested to RINA standards.

There is a rail system and bosons chair for the cleaning of the hull side windows.

Superstructure glass and wheelhouse screens are thermally toughened only and also tested to RINA standards.

*VI.*18 WINDOW WIPERS

Heavy duty electrical marine type window wiper are fitted for each forward wheelhouse window, they have a control panel in the wheelhouse providing various speed options and auto wash from the fresh water system via a solenoid valve.

*VI.*19 GRILLS

Stainless steel powder coated louvered grills for air are bolted into their recesses built into the superstructure in correspondence of:
- Main engine room air intake
- Main engine room air exhaust
- Main galley hood fan extractor outlet

FRP louvered grills for air are fitted in recesses built into the superstructure in correspondence of:
- Circulation air treatment unit's intakes
- Accommodation air extraction outlets

*VI.*20 HORN

A marine grade horn is fitted to the Flybridge roll bar and is operable from both helm locations and the cockpit station.

*VI.*21 FLAGPOLES

Two flag poles are provided, one at the aft of the upper deck for the main flag and a second on the aft of the Flybridge for the courtesy flag, a bow flag pole is also provided.

*VI.*22 FENDERS

12 Cylindrical fenders F11 size.

*VI.*23 FENDER STORAGE

Suitable storage is provided in the forecastle locker.

*VI.*24 DECK INVENTORY

No deck equipments are provided due to the varying nature of each flag.

*VI.*25 FIRE EXTINGUISHING EQUIPMENT

Extinguishers in all areas are supplied in compliance with RINA, other fire fighting requirements that depend on flag are the responsibility of the Owner.

*VI.*26 DRAFT MARKS

Draft marks shall be provided port and starboard, fore and aft in accordance with flag requirements.

VII. NOISE AND VIBRATION

*VII.*1 GENERAL

The acoustic performance of the yacht is a major influence on our design; we have designed the yacht in conjunction with Van Cappellen consultants to comply with or exceed RINA "Comfort Class" certification

This involves a verity of materials applied to the steel and FRP structure, isolation of all machinery from structure and floating box design for the accommodation areas.

*VII.*2 ENGINE ROOM AND MACHINERY

Engine and gearbox on soft resilient mountings to isolate running noise from steel structure. Connection to shaft via specially designed Centa flexible coupling preventing running noise form shaft and allowing more flexibility in engine mountings.

All Generators are provided with additional highly flexible mounts in addition to the standard units further isolating them from the structure.

All pumping equipment mounted on flexible systems isolating them from the structure.

All exhaust systems have mufflers on main exhaust and additional bypass mufflers or in the case of generators additional gas mufflers to reduce exhaust noise to minimum, mufflers are flexibly connected to prevent transfer of vibration to hull structure.

Special vibration damping materials are applied to key areas of the steel structure within the engine room and sound absorbing insulation is used to minimise ambient noise, sound blocking steel sandwich plating is used to line the ceiling further preventing passage of sound into the saloon.

All tanks and Stabilizer areas have special sound deadening materials applied to surfaces to reduce the passage of sound and prevent amplification of any vibration present when running.

*VII.*3 ACCOMMODATION Inc. CREW

All accommodation areas have thermal and sound insulation, there are 3 distinct systems combined to provide this all applied directly to the steel structure creating a multi layer sound and thermal barrier exceeding 100mm thick.

Then each cabin area is built as an independent floating box providing full isolation from the main yacht structure, box-in-box construction. This method provided excellent sound and vibration isolation. In addition to this all partition bulkheads are made from noise blocking sandwich panels and filled with sound absorbing material to prevent the maximum block to sound transfer between cabins.

Air-conditioning duct systems are special designed to reduce air noise from ventilation systems and we are using Cruisair "WisperCool" air-conditioning with silent running motors on all fans for air distribution.

*VII.*4 MATERIALS

Materials used on the construction of the yacht are from the leading suppliers in the industry and will all comply with RINA regulations for fire resistance, they have been chosen after a detailed study including structural FEA of all areas in conjunction with and under the guidance

Of Van Cappellen consultants.

Installation of all materials is under the direct supervision of our consultants.

VIII. AIR CONDITIONING AND E.R. VENTILATION

*VIII.*1 AIR-CONDITIONING DESIGN

The air-conditionings system has been designed by Cruisair and our own technical department to provide for usage from -8° to +40° C ambient, we are using a central chilled water system with reverse cycle for heating in warmer waters, in addition to this there are electric barrel heaters which can heat the water system when sea water temperatures do not allow effective heating in reverse cycle.

The system is designed for low noise from chiller plants and air handlers using variable speed chillers and "WisperCool" air handlers in accommodation areas.

All pipe work is designed considering the flow requirements of the air handlers and fully insulated throughout the yacht, piping type is Auqatherm piping which presents excellent thermal properties also.

*VIII.*2 CHILLING PLANT

The chiller plant is made up of 5x 72,000BTU VARC variable speed chillers rack mounted which are capable of producing up to 396,000BTU in Boost mode.

The VARC chiller uses a precision PID (proportional integral derivative) loop control algorithm that modulates the compressor speed and balances chiller output with required load. This smooth operation eliminates large swings in current on the generator.

The VARC chiller uses the advanced technology of an Electronic Expansion Valve (EEV). This provides more precise control of superheat across a broad range of conditions with no erratic swings as the valve reacts to temperature and pressure changes (no "hunting"). Using an advanced algorithm, superior superheat control is maintained over extreme operating conditions.

The innovative design of plumbing connections improves ease of installation and maintenance. All connections come straight out of the unit to simplify the manifold and minimize the final installation depth while also presenting clean and professional plumbing connections.

Chiller plant control is via its own dedicated PLC control system specifically programmed for the yacht.

*VIII.*3 FAN COILS

Fan coils are installed in the accommodation spaces in position to achieve a good air flow without causing uncomfortable drafts and where they can be accessed for servicing or replacement.

All air ducting is either piped or built in ducting and designed to minimise the production of condensation and noise in the cabin. Fan coils have condensate drains to the grey water system.

Controls are located near the beds in cabins or door way in other areas, fan speeds are variable and have DC "WisperCool" motors eliminating motor hum at low fan speeds.

*VIII.*4 AIR CHANGES

The fresh air system is provided by 2 central 1000m^3/h units, FAM and RAM units which are mounted above the wheelhouse ceiling. Fresh pre cooled or heated air is delivered to the local air handler via a duct system where it provides additional air into the area.

Extraction is continuously running from each bathroom in the cabins or from concealed grills in saloon area removing an equal amount of air from the area so maintaining a pressure and flow balance in the area.

In addition if required all areas have openable port lights or windows when air-conditioning is not required and fresh air is preferred.

*VIII.*5 ENGINE ROOM VENTILATION

The engine room ventilation is provided by natural air intakes calculated to allow sufficient volume of air flow in up to +40^o C ambient conditions. Intakes are located on both port and starboard sides of the superstructure and protected with grills, internal snail type air lift duct and water traps remove water passage into the engine room.

4 Extraction fans remove hot air and discharge overboard through grills on the superstructure sides, all fans will run during engine operation but only single local fans will run when generators are running.

All intake and outlet ducts are fitted with fire flaps which automatically close in case of fire.

IX. INTERIOR

Numarine takes great pride in the selections and choices we offer for our standard designer items including the marble, feature lighting, fabrics and furniture. All these items are upgradable to personal choice during the selection process and any values exceeding our standard will be calculated and added as an extra to the contract.

*IX.*1 GENERAL

Please review the GA for layout design of all areas.

Soft furnishings, veneers, carpet or parquet choices are available for all areas and will be discussed with our designer to accommodate the owners colour choices and living style.

We endeavour to provide a high quality choice for our owners from a range of high quality materials, if specific designer materials are requested there will be upgrade options available.

*IX.*2 OWNERS ACCOMMODATION

Located on the upper deck the full beam accommodation comprises of a large sleeping area with SuperKing size bed backed by large wardrobes which create a personal dressing area. The bed faces the aft sliding glass doors with view across the upper deck and into the horizon. The entry is from the upper lobby passing the ample wardrobe and storage area with fitted safety box, mini bar and dumb waiter into the aft facing room.

There is a make-up table with chair on the port side with cupboards and a small seating area, to starboard is the large 65" wall mounted TV fitted in the aft corner viewable form the bed or the port seating area and a second bench seat against the starboard side, connected to the TV is the Marantz surround sound cinema system with Bowers & Wilkins speakers which also doubles as the music system for the owners enjoyment. Apple TV, Bluray player, Sonos interface and satellite receiver are all connected to this system. Music can also be played outside on the upper deck via German Maestro Marine speakers for relaxing breakfasts or romantic sunsets.

The side windows have two opening sections one per side to allow perfect ventilation when air-conditioning is not desired, all windows and sliding door have black-out blinds in addition to acetic blinds with concealed lighting producing a relaxing ambient feeling.

Overhead lighting is concealed 24v DC LED type around the edges of the room with a recessed lighting feature above the bed. Accent lighting below the bed and in window areas, feature lights on top of the wardrobes and bedside are 230v AC.

The ensuite bathroom has a large glass fronted shower area with rain shower, "his and hers" sinks and a combined bidet toilet. Sink unit top, floor and walls in marble chosen to complement the subtle colour choices of the owner. Lighting is concealed 24v DC LED type with dedicated wall mirror lighting.

The whole area is fully air-conditioned with 72,000 BTU of heating or cooling available, fan coils are located around the room with controls at the bedside; central unit can be switched separately to outer units to prevent direct air over the bed whilst sleeping.

Permently running fresh air supply and extraction form the shower area ensures a fresh feel to the room at all times without the need to open windows.

*IX.*3 MASTER ACCOMMODATION

Located forward on the main deck level this full beam accommodation comprises of a large sleeping area with King sized bed against the forward bulkhead facing aft. The bed is flanked by a choice of walk-in dressing area and ensuite bathroom or "his and hers" ensuite bathrooms.

To the port side there is a desk and make-up area with chair facing the full length windows, aft of this is an ample wardrobe space against the aft bulkhead. A 55" TV is fitted above a low level unit with safety box and mini bar located centrally on the aft bulkhead viewable for the comfort of the bed. Sound is provided by a Marantz sound system with Bowers & Wilkins speakers giving a room filling experience. Apple TV and satellite equipment is also connected.

To the starboard side there is a second wardrobe aft and a seating area against the full length window.

The side windows have two opening sections one per side to allow perfect ventilation when air-conditioning is not desired, all windows have black-out blinds in addition to acetic blinds with concealed lighting producing a relaxing ambient feeling.

Overhead lighting is concealed 24v DC LED type around the edges of the room with a recessed lighting feature above the bed. Accent lighting below the bed and in window areas, feature lights on the bedside tables are 230v AC.

The ensuite bathroom has a large glass fronted shower area with rain shower, single bathroom option has "his and hers" sinks and a combined bidet toilet. Twin bathroom option has independent bidet toilets and sinks with a central combined glass walled shower. Sink unit top, floor and walls in marble chosen to complement the subtle colour choices of the owner. Lighting is concealed 24v DC LED type with dedicate wall mirror lighting.

The whole area is fully air-conditioned with 36,000 BTU of heating or cooling available, fan coils are located at either side of the room with controls at the bedside.

Permently running fresh air supply and extraction form the shower area ensures a fresh feel to the room at all times without the need to open windows.

*IX.*4 GUEST VIP ACCOMMODATION

Located aft on the lower deck level there are two VIP accommodations, one port and one starboard side which mirror each other.

The airy accommodation has a queen sized bed facing forward located against the aft bulkhead forward of the ensuite area. There are bedside tables on either side, inboard of the bed is the entrance to the ensuite bathroom.

Outboard of the bed are twin port lights, openable and with storm shutters, black-out blinds in addition to acetic blinds with concealed lighting producing a relaxing ambient feeling.

On the forward bulkhead is a make-up table or desk with chair and shelving unit to outboard side. A 42" TV is mounted above on the wall with BOSE Solo 5 soundbar for TV and music sound. Inputs for decoder or other entertainment sources are supplied.

Overhead lighting is concealed 24v DC LED type around the edges of the room with accent lighting below the bed and in window areas, feature lights on the bedside tables are 230v AC.

The ensuite bathroom has a glass fronted shower area with adjustable shower head, sink and a combined bidet toilet. Sink unit top, floor and walls in marble chosen to complement the subtle colour choices of the owner. Lighting is concealed 24v DC LED type.

The whole area is fully air-conditioned with 18,000 BTU of heating or cooling available, fan coils are located below the bed with air outlet on outboard hull side of the room with control at the bedside.

Permently running fresh air supply and extraction form the shower area ensures a fresh feel to the room at all times without the need to open windows.

IX.5 GUEST TWIN ACCOMMODATION

Located forward on the lower deck level there are two Twin accommodations, one port and one starboard side which mirror each other.

The accommodation has a twin single beds facing aft located against the outboard and inboard sides and forward bulkhead. There is a shared bedside tables between the beds, the entrance to the ensuite bathroom is central on the aft bulkhead.

Outboard of the beds are twin port lights, openable and with storm shutters, black-out blinds in addition to acetic blinds with concealed lighting producing a relaxing ambient feeling.
A 42" TV is mounted on the aft bulkhead inboard of the bathroom door with a BOSE Solo 5 soundbar for TV and music sound. Inputs for decoder or other entertainment sources are supplied. Outboard of the bathroom door and aft of the bed is a wardrobe with internal shelving and hanging space.

Overhead lighting is concealed 24v DC LED type around the edges of the room with accent lighting below the bed and in window areas; feature light on the bedside table is 230v AC.

The ensuite bathroom has a glass fronted shower area with adjustable shower head, sink and a combined bidet toilet. Sink unit top, floor and walls in marble chosen to complement the subtle colour choices of the owner. Lighting is concealed 24v DC LED type.

The whole area is fully air-conditioned with 12,000 BTU of heating or cooling available, fan coils are located below the bed with air outlet on outboard hull side of the room with control at the bedside.

Permently running fresh air supply and extraction form the shower area ensures a fresh feel to the room at all times without the need to open windows.

*IX.*6 LOWER DECK LOBBY

The lower deck lobby provides access to the guest accommodation areas, the stairs descend from the main deck lobby into this area. Access to the central bilge tunnel is also located in this area also.

On the port side there is a mini bar area with fridge and storage for the use of the guests. Also located here is the lower accommodation electrical supply board. To the starboard side is more storage for towels and bedding of the guest areas.

IX.7 MAIN DECK LOBBY

The main deck lobby provides access to from the saloon to the lower deck, upper deck, master cabin, day head and gym area. It has a glass feature staircase to the upper lobby and owner's cabin. Here there is space for a sculpture if the owner wishes.

The lobby, upper lobby and lower lobby are air-conditioned with 12,000 BTU fan coil situated at the highest point so cool air falls through the 3 levels.

The glass wall separating the gym form the lobby has metal design details and wall lighting.

The day head here has combined bidet toilet and sink unit with designer sink.

*IX.*8 GYM

The air-conditioned gym provides space for two basic machines of owners choice, a wall mounted TV for entertainment and 18,000 BTU of air-conditioning.

There is an access door to the starboard side deck via a weatherproof door. The full glass hull side provides views over the sea whilst training.

Blinds to the internal glass wall provide privacy also during training sessions and allow natural light into the lobby when not in use.

IX.9 SALOON AND DINING AREA

The main entrance to the saloon area is via the large sliding glass door on the cockpit, walking into the saloon on the port side there is a large "U" shaped seating arrangement with coffee table. To starboard is the 65" TV mounted at an angle to allow viewing from all areas of the saloon. A large lounging chair free standing is also found here.

To both port and starboard side are large windows filling the saloon with natural light, two section of these one per side are openable to provide fresh air flow across the saloon. Ascetic blinds are fitted for privacy in the evenings with hidden accent 24v DC LED lighting.

Further in is the dining area with its large limed oak wooden dining table with chairs set athwart ship and centrally located providing relaxed seating for 8 persons to dine. Overhead is a feature wood design with hanging 230v AC lighting. The forward bulkhead has illuminated marble panels and central shelving unit, additional storage units are located to port and starboard side aligned with the table.

There are two further doors from here to either side deck and doors to the main lobby and galley.

Overhead lighting is 24v DC LED type with accent lighting in window areas, feature lights around the area and above the dining table are 230v AC.

The whole area is fully air-conditioned with 84,000 BTU of heating or cooling available, fan coils are located in the ceiling and ducted to outlets on both sides of the area and above the table through the wood feature design in the ceiling.

The saloon contains the main entertainments system for the yacht, A Marantz amplifier supplies music to the beach club, cockpit, foredeck and Flybridge in addition to the saloon area, internal speakers are Bowers & Wilkins and external German Maestro Marine type. Sonos, Apple TV, satellite decoder, bluray player and additional inputs are supplied.

*IX.*10 GALLEY

There are two entrances to the galley one from the saloon and one from the port side deck area plus the crew access is via the galley.

The galley is laid out in an "L" shape with a main food preparation area and storage to the side. The storage area has three full height Siemens fridges and one full height wine cooler provided. Opposite these equipments there is a narrow worktop area with storage below.

The main area has ample work top provided with dishwasher and storage provided below. Cooking is from a large Siemens 5 ring hob with combination oven/microwave unit below; there is an extraction hood overhead. A twin bowl sink is located in the worktop on the starboard aft side.

There are storage units below the worktop and wall mounted above the inboard work area. A dumb waiter serves to the owner's cabin and Flybridge, next to this is a full size coffee machine.

On the port side there is a large window providing natural light into the galley, aft of this under the access steps to the forepeak is a storage cupboard where the electrical panels are housed. Forward of this is the access door to the crew quarters.

*IX.*11 WHEELHOUSE

The wheelhouse is accessed by an internal door from the upper lobby or from the two side doors opening on to the foredeck area. The area is fully glazed providing excellent visibility all around the foredeck and to sea.

To the port side of the helm there is a small drinks preparation area and a day head for the crew use. Access door to the port side walkway.

To the starboard side of the helm there is a chart table, access door to the starboard side walkway and against the aft bulkhead are the main helm power distribution panels.

Centrally against the aft bulkhead there is a raised seating area for the crew to relax and still be able to monitor the progress of the yacht safely.

The helm will be laid out with the equipment detailed in the navigation section in an ergonomic way. There are two helm seats provided.

*IX.*12 BEACH CLUB

The beach club area is behind the transom door, main access is when the transom door is opened forming a beach area for bathing and the club area for relaxing inside the structure. There is an emergency escape to main deck also and access via the engine room.

The lounging area in teak and white is to the port side of the club with matching coffee table and to starboard a bar area with fridge and icemaker, a swimming shower is provided on the starboard side of the beach and a full shower is provided in the back of the club area. There is also a changing room and separate toilet.

This area is fully air-conditioned with 36,000 BTU of heating or cooling arranged overhead creating an air curtain in the doorway. There are German Maestro Marine speakers here for music from the main saloon unit.

Access to the starboard side laundry with separate washer and dryer plus storage and port side technical space for AC main power controls and systems is also from this area via water tight doors.

*IX.*13 CREW

IX.13.1 General

The crew area access is from the galley down the internal stairs, it is arranged with a captain's cabin with ensuite and two twin crew cabins also with ensuite. There is a mess/lobby area and laundry area also.

V.13.2 Mess/Lobby/Laundry

Entering the area from the stairs to the aft you have the laundry area, there is storage here for linen and towels plus a washer and drier installed, space for ironing. Overhead there are electrical distribution boxes in a locker. Also on the mess aft bulkhead facing the mess area

there is a PLC screen for access to the boats systems and a Raymarine monitor for CCTV and navigation monitoring by the crew when underway.

Forward to port is the mess area, this has storage and a worktop area with small fridge and combo microwave oven for food prep. Seating and table are provided here for the crew. To the starboard side are 2x full height Siemens freezers plus a wall mounted TV.

The area has 24,000 BTU of heating or cooling located under the entry stairs and distributed around the space with independent control, also there is an opening port light with dead light for fresh air if required. The area is also supplied from the main internal fresh air make-up system.

Access to captains and crew cabins is from this space.

V.13.3 Captain's Cabin

Access from the crew lobby opens into a large cabin with a double bed against the hull side next to a large wardrobe with fitted safety box for boat documents.. On the aft bulkhead there is a working desk with desk light. Entry into the ensuite bathroom is forward of the wardrobe.

The area is fully air-conditioned with 9,000 BTU of heating or cooling available, the fan coil is located behind the wardrobe with air outlet on outboard hull side of the room with control at the bedside. An openable port light with dead light is also available for fresh air. The area is also supplied from the main internal fresh air make-up system.

A 22" TV is mounted on the aft face of the wardrobe, Inputs for decoder or other entertainment sources are supplied.

Overhead lighting is exposed 24v DC LED type fitted into the ceiling panels.

The ensuite bathroom has a glass fronted shower area with adjustable shower head, sink and a combined bidet toilet.

V.13.4 Crew Cabins

Access from the crew lobby opens into a these compact cabins with bunk beds against the hull side. Forward there is a wardrobe before entering into the ensuite bathroom.

The area is fully air-conditioned with 9,000 BTU of heating or cooling available, the fan coil is located behind the wardrobe with air outlet on outboard hull side of the room with control at the bedside. An openable port light with dead light is also available for fresh air. The area is also supplied from the main internal fresh air make-up system.

Overhead lighting is exposed 24v DC LED type fitted into the ceiling panels.

The compact ensuite bathroom has a glass fronted shower area with adjustable shower head, sink and a combined bidet toilet.

Access to the forward bilge and chain wash pump is from the port crew cabin behind the steps to the bathroom and access to the bow thruster area is from the starboard crew cabin through a hatch in the floor.

X. EXTERIOR

*X.*1 COCKPIT

The cockpit is accessed from the passerelle on port side or from the two staircases to port and starboard. Optional side boarding gates in the walkways can be added if required.

The cockpit has a main seating area with table for dining; loose chairs can be added to provide comfortable seating for 8 persons, behind the seating is a sun lounging area. There is a bar with fridge, icemaker and small sink on the forward port side to serve you whilst you relax.

Overhead are 4 German Maestro Marine speakers connected to the saloon entertainments system and 2 independent banks of 24v DC LED lights. Low level lighting is provided on steps and around the superstructure, also from below the cockpit table.

From the cockpit you can access the saloon via the large sliding glass doors, the upper deck from the aft stairs and along the port side to the forward stairs you can reach the foredeck and wheelhouse. There is also access to both saloon and galley on the port side and saloon and gym on the starboard side.

*X.*2 UPPER DECK

The upper deck is the owner's level, it is a large storage deck for tenders and toys but when cleared it becomes a fantastic relaxing area or games area giving a full 50m^2 of space.

There is a 2,500Kg crane for loading toys with flood lighting and low level accent lights, music from the owner's cabin system and space. Life rafts are also located at this level.

The area has 2 German Maestro Marine speakers connected to the Owners cabin entertainments system.

A 3m extending electric bimini provides shade for the breakfast area on the owner's deck when required.

Access to the foredeck and Flybridge.

*X.*3 FOREDECK

Apart from the deck gear detailed in its section the foredeck is another lounging space, forward facing seating with folding table looks across the twin sun beds and out to sea. There is also a seating area in the bow to enjoy an uncluttered view of the sea or to look back over the forward area.

The area has 2 German Maestro Marine speakers for music from the saloon music system and low level accent lighting, flood lighting is also provided when working with deck gear.

*X.*4 FLYBRIDGE

The Flybridge is only accessible from the upper deck steps; there is a large central table for 12 people to eat comfortably, 12 outside dining chairs are supplied for the yacht. and a lounging area aft with Bimini/sunshade overhead.

The wet bar on the starboard side has BBQ, fridge, icemaker and sink making it ideal for preparing snacks whilst entertaining. To the port side storage cupboards and the dumb waiter deliver food direct from the galley.

The roll bar overhead provides shade for dinning and subtle lighting at night, above all the navigation requirements are mounted to take you to any destination you can imagine on the seas.

Forward on the Flybridge is the upper helm and two side seats for the perfect view during navigation.

Music is provided from the saloon music system via 4 German Maestro Marine speakers mounted at low level around the deck.

There is a canvas bimini system from the aft of the rollbar to the aft of the fly deck divided into 3 sections to provide shade while relaxing.

XI. PAINTING AND FINISHING

*XI.*1 GENERAL

All steel surfaces are primed in accordance with recognised priming systems for steel construction using International epoxy based products. Tanks for water and sewage and top coated with specific paints designed and supplied by International paints for these locations. Final inspection and approval is obtained from International Paints local inspector.

All external steel painted surfaces will be primed and faired with International products approved for use by International and finished with Awlgrip topcoat unless otherwise agreed with the customer. Special requests for metallic paints may not be able to be supplied in Awlgrip finishes, in this case alternative products of the highest standards will be offered.

FRP superstructure and Flybridge is produced in gelcoat for easy maintenance, depending on colour requirements painting can be applied to meet customer requests.

XI.2 HULL

Below waterline; International epoxy primer as detailed by International followed by interprotect primer and 3 coats of Micron 99 antifouling in Black.

Above waterline; International epoxy primer and filler layers as detailed by International followed by Awlcraft topcoat paint in colour choice of the owner.

*XI.*3 SUPERSTRUCTURE

All FRP sections will be finished in polyester gelcoat as moulded finish, should special colours be requested by the customer we will paint over the gelcoat with high quality paint, type will depend on finish type requested.

XII EQUIPMENT LIST

NUMARINE XP 32 MAKERS LIST

Euro Option

50Hz

NO	ITEM	MAKER	MODEL	REMARK	QTY	KW	DC VOLT	AC VOLT
	GENERAL EQUIPMENTS							
1	BOW THRUSTER	CMC MARINE	BTM 50H	HYDRAULIC	1	45		
2	STERN THRUSTER	CMC MARINE	BTM 30H	HYDRAULIC	1	30		
3	STABILISERS	CMC MARINE	SE80.7.4.160	ELECTRIC //	2	7	24	380
4	ANCHORS	BARAN YACHT	230kg - HHP	STAINLESS	2			
5	CHAINS	DATA	GRADE U2	Ø14mm	150m+180m			
6	WINDLASS	DATA	DZC 2200 HPI/Kr-14L VERTICAL	HYDRAULIC	2			
7	CAPSTAN	DATA	DHC 2200 HPI/Kr	HYDRAULIC	2			
8	DECK CRANE	BESENZONI	ART. G 360 G TELESCOPIC CRANE 2500Kg -WITH FIBREGLASS COWLING - 380V/24 V. BACK UP	ELECTRO HYDRAULIC - Max from 180°to 270°	1		24	380
9	SLIDING SALOON DOOR	BOFOR	BESPOKE DESIGN	MANUAL	1			
10	SLIDING OWNERS DOOR	BOFOR	BESPOKE DESIGN	MANUAL	1			
11	PANTOGRAPH SIDE DOORS	BOFOR	BESPOKE DESIGN		3			
12	FRESH AIR MAKE UP & EXTRACTION	DOMETIC	FAM 1000cm/h		1 pair			
13	FUEL SENDERS, WATER SENDERS	WIKA	PRESSURE TRANSMITTER A-10		9		24	
14	BACK UP FUEL SENDERS	WEMA	FLOAT TYPE		4		24	
15	SHOWER TANKS	VELA	INTEGRAL PUMPS		5		24	
16	SUBMERSIBLE BILGE PUMPS	RULE	3 PCS OF RULE 1500-03 24V 2.3A , 5 PCS RULE IL500 - 24 24V 3A		8	0.075	24	
17	LIFE RAFTS		SOLAS B 10 MAN		2			
18	DROP DOWN WINDOWS	TREND	BESPOKE DESIGN		4		24	
	GALLEY EQUIPMENT							
19	HOB	SIEMENS	ET875LMV1D	90 cm	1	7.9		230
20	OVEN	SIEMENS	VB558COSO	90 cm	1	3.3		230
21	EXTRACTOR	SIEMENS	LC97BD532	90 cm	1	0.139		230
22	REFRIGERATOR	SIEMENS	KS36VAI31 iQ500 Inox Easy Clean Refrigerator		3	0.09		230
23	DISHWASHER	SIEMENS	SN26N080TR					230
24	WINE COOLER	GAGGENAU	RW464361 Wine Cooler (Glass Door)		1	0.131		230
25	COFFEE MAKER	V-ZUG	Supremo XSL		1	1.35		230
26	DUMB WAITER	ISAS	400 D x450 Wx 500 H (mm)		1	0.55		
	Owner Cabin							
27	REFRIGERATOR AT OWNER CABIN	VITRIFRIGO	C39i	Under bench	1	0.03	24	
	Master Cabin							
28	REFRIGERATOR AT MASTER CABIN	VITRIFRIGO	C39i	Under bench	1	0.03	24	
	Guest - VIP Cabins Corridor							
29	REFRIGERATOR	INDEL WEBASTO	Cruise 42 Inox	Under bench	1	0.275	24	
	Flybridge							
30	REFRIGERATOR	VITRIFRIGO	DW100	Under bench	1	0.04	24	
31	ICEMAKER	VITRIFRIGO	IM Classic Refill P		1	0.14		230
32	GRILL	KENYON	CUSTOM		2	1.5		230

NUMARINE XP 32 MAKERS LIST

Euro Option

50Hz

NO	ITEM	MAKER	MODEL	REMARK	QTY	KW	DC VOLT	AC VOLT
	Crew							
33	FREEZER	SIEMENS	GS36NAI31 iQ500 Inox Easy Clean No frost Freezer with drawers		2	0.09		230
34	REFRIGERATOR	VITRIFRIGO	C115IX	Under bench	1	0.045	24	
35	WASHING MACHINE	SIEMENS	WM10Q482TR		1	1.1		230
36	TUMBLE DRYER	SIEMENS	WT46S52STR		1	2.8		230
37	CHAIN WASH PUMP	CEM	INOX 025 3,48 m3/h		1	0.45		380
38	WATER HEATER MAIN	QUICK	NAUTIC BOILER BK 200L 10/8BAR		1	2		230
39	WATER HEATER CREW	QUICK	NAUTIC BOILER BK 150L 10/8BAR		1	2		230
40	WATER CIRCULATION PUMP	CEM	CR 20/4 2,6M^3/H	Hot water system	2	0.07		230
41	MICROWAVE/OVEN	SIEMENS	HF15G564		1	1.27		230
	Beach Area							
42	REFRIGERATOR	ISOTHERM	Drawer 65 Inox	Under bench	1	0.03	24	
43	ICEMAKER	VITRIFRIGO	IM Classic Refill P		1	0.14		
44	TOILET HEADS	TECMA	PRIVILEGE BONE COLOUR PRI024NP / T02CO		10	0.48	24	
	COCKPIT BAR EQUIPMENT							
45	ICEMAKER	VITRIFRIGO	IM Classic Refill P		1	0.14		230
46	REFRIGERATOR	ISOTHERM	Drawer 65 Inox		1	0.03	24	
	ENGINE ROOM COMPONENTS							
47	MAIN ENGINES	CATERPILLAR	C18 ACERT C RATING	715 BHP@1800-2100RPM	2	533	24	230
48	TRANSMISSION	ZF	665 A	Coupled	2			
49	PROPULSION	TEIGNBRIDGE		SHAFT, COUPLING, ETC	2			
50	FLEXIBLE COUPLING	CENTA	CENTAX-LFSM-+-003-60343-000-000		2			
51	PROPELLER	TEIGNBRIDGE			2			
52	BILGE PUMP & FIRE PUMPS	CEM	070 15M^3/H	Main bilge pump and main fire pump	2	5.5		380
53	EMERGENCY FIRE PUMP - DIESEL	CEM	AMD-D50 18M^3/H		1	6.7	12	
54	WATER PRESSURE PUMPS	CEM	GDV-JBR 4/2 160LT/M (VERTICAL STACK / AC-AC PUMP)		1	1.5		380
55	PRESSURE TANK OF WATER PRESSURE SET	CEM	60X 60L		2			
56	DAMPERS	CEM	BESPOKE DESIGN					
57	ENGINE EXTRACTOR FANS	EBM PUMPS	350 AXIAL FANS	AC fan	4	0.127		230
58	WATER TIGHT DOORS	BOFOR	600 x 1800 mm CLEAR OPENING		1			
59	WATERTIGHT HATCHES	BOFOR	500 x 500 mm CLEAR OPENING					
60	SEWAGE TREATMENT	TECNICOMAR	ECOMAR 45		1	1.35		380
61	GRAY& BLACK WATER DISCHARGE PUMPS	CEM	SBM MIDEX/2 4,8M^3/H		2	0.75		380
62	GRAY& BLACK WATER DISCHARGE PUMPS (USA OPTION)	CEM	SBM MIDEX 82l/min		2			
63	MAIN ENGINE EXHAUST SYSTEM/SILENCER	CENTEK/MANUFLEX			2			
64	GENERATOR EXHAUST SYSTEM / SILENCER	CENTEK/MANUFLEX			3			
65	FUEL TRANSFER PUMP	CEM	GEAR 50B 3M^3/H 5 Bar Bronze		1	1.5		380
66	FUEL SEPERATOR	ALFA LAVAL	CENTRIFUGAL SEPARATOR MIB303		1	0.7		230
67	SILVER-ION STERILIZER	JOWA	15 M^3/H		1	0.03		230
68	WATER SOFTENER	OCTOMARINE	OCTO COMPACT 1500~3000L/H DN20		1			
69	WATER MAKER	TECNICOMAR	SAILOR C1500 400V	220 L/H	2	2.35		380
70	FUEL FILTER MAIN ENGINES	SEPAR	SWK-2000/10 DUPLEX, W/METAL BOWL&GAUGE		2			
71	FUEL FILTER GENERATOR SETS	SEPAR	SWK-2000/5 DUPLEX, W/METAL BOWL&GAUGE		3			
72	SLUDGE TANK DISCHARGE PUMP	CEM	020 1,8 M^3/H	For Sludge tank	1	0.33		380
73	FUEL TRANSFER BACKUP PUMP	CEM	GEAR 15B 0,9M^3/H Bronze	Back-up pump	1	0.55	24	
74	WATER STRAINER FOR MAIN SEAWATER INTAKE	CSY MARINE	Soytek GGG40 rg5 flanged DN150 "L" type		2			
75	WATER STRAINER FOR AFT SEAWATER INTAKE	CSY MARINE	Soytek GGG40 rg5 flanged DN80 "L" type		1			
76	WATER STRAINER FOR FWD SEAWATER INTAKE	CSY MARINE	Soytek GGG40 rg5 flanged DN65 - "T" type	For FWD Sea Water Intaker	1			
77	GENERATORS	ONAN	50Hz, 3 PHASE DIESEL, 65 Kw@ 1500 rpm		2	65	24	380
78	GENERATOR - NIGHT	ONAN	50Hz, 3 PHASE DIESEL, 27 Kw@ 1500 rpm		1	27	24	380
79	AIR CONDITIONERS	DOMETIC	5x VARC 72 CHILLERS	Fan coils and chillers	5		24	230

NUMARINE XP 32 MAKERS LIST

Euro Option

50Hz

NO	ITEM	MAKER	MODEL	REMARK	QTY	KW	DC VOLT	AC VOLT
80	AIR CONDITIONERS	DOMETIC		Seawater pumps	2			380
81	AIR CONDITIONERS	DOMETIC		Chilled water pumps	2			380
82	HEATER BARRELS	DOMETIC			3	10		380
83	HYDRAULIC SYSTEM	DATA	250L TANK, 2 GEARBOX DRIVEN PUMPS, 1 ELECTRICAL PUMP	HYDRAULIC	1	21.2	24	380
	ELECTRICAL EQUIPMENT							
84	ELECTRICAL PANELS AND CONTROLS	ENERGY SOLUTIONS	BESPOKE DESIGN	WIRING DESIGN, PLC AND BREAKER PANELS FROM UK				
85	SERVICE BATTERIES	VICTRON GEL	10 OPzV 1000 GEL OPzV tubular plate 2V cells	1000AMP	12		2	
86	START BATTERIES	VICTRON AGM	12V/220Ah AGM Deep Cycle Batt.	220 AMP	4		12	
87	GENERATOR BATTERIES	VICTRON AGM	12V/110Ah AGM Deep Cycle Batt.	110 AMP	4		12	
88	EMERGENCY BATTERIES	VICTRON GEL	12V/220Ah GEL Deep Cycle Batt.	220 AMP	2		12	
89	VHF BATTERY	VICTRON GEL	12V/220Ah GEL Deep Cycle Batt.	220 AMP	1		12	
90	DIESEL PUMP BATTERY	VICTRON AGM	12V/60Ah AGM Deep Cycle Batt.	60 AMP	1		12	
91	SHORE CABLE RECOVERY	GLENDENNING	CM-8 WITH AL HAWSE PIPE + 22" x 22" container	125AMP	1		24	380
92	BATTERY CHARGER	VICTRON	Charger 1 Victron 24/100TG 3 Ph - Skylla 24/100TG		1	2.4		380
93	BATTERY CHARGER	VICTRON	Charger 2 Victron 24/100TG 3 Ph - Skylla 24/100TG		1	2.4		380
94	BATTERY CHARGER/INVERTERS	VICTRON	Charger 3 Victron MultiPlus C24/5000/120 1Ph		1	3		230
95	BATTERY CHARGER	VICTRON	Engine Charger Victron 24/16 3 output 1Ph - Blue Power IP22		1	0.4		230
96	BATTERY CHARGER	VICTRON	Generator Victron 24/16 3 output 1Ph - Blue Power IP22		1	0.4		230
97	BATTERY CHARGER	VICTRON	Fire Pump Charger Victron IP65 12/10 - Blue Power IP65		1	0.15		230
98	BATTERY CHARGER	VICTRON	VHF Bat Charger IP65 12/15 - Blue Power IP65		1	0.2		230
99	BATTERY CHARGER	VICTRON	VHF Bat Charger Orion 24/12-25		1	0.2	24	
100	BATTERY CHARGER	VICTRON	Emergency Bat Charger IP65 24/8 - Blue Power IP65		1	0.005		230
101	BATTERY CHARGER	VICTRON	Emergency Bat Charger Orion 24/24-15		1	0.36	24	
102	WIPERS	EXALTO	Exalto Wiper 255BS (sides) / Linkage wiper KW2 (centre)		3		24	
103	FAM & RAM Units	DOMETIC	AHU-T1000-DRAPS ECS-T1000-DRAPS		1	7.5		380
	TECHNICAL SPACE							
104	WASHING MACHINE	SIEMENS	WM10Q482TR		1	1.1		230
105	DRYER	SIEMENS	WT46S52STR		1	2.8		230
106	FIRE SYSTEM	SECKIN	FM200			0.01	24	
107	PASARELLA	BESENZONI	PI 383.500		1		24	
108	STERN DOOR/PLATFORM	REIS DENIZCILIK	BESPOKE DESIGN	HYDRAULIC	1	50	24	
109	STEERING	DATA	DDS 2x550-ESC	ELECTRO HYDRAULIC	1	1.5	24	380