



INTERNATIONAL SHIPYARDS ANCONA

**ISA\_120.07**

**FIRST CLASS WATERJET PROPULSION  
LUXURY MOTOR YACHT**

**TECHNICAL SPECIFICATION**



*Rev,02 -30 October, 2006*

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## 00 GENERAL

### 0010 INTENT OF THE SPECIFICATION

The intent of the present Specifications and attached General Arrangement Plan and General Profile drawings is to describe the technical details relative to the construction of a "Mediterranean" jet propelled planning Motor Yacht built in Glass Reinforced Plastics operated by professional crew.

The specification has been detailed with the understanding that the yacht will be registered under U.K. Flag. Different flags could determine changes in the safety equipment required on board that will be considered on a case by case basis.

The word "Owner" used in the specifications, unless otherwise required by context, shall mean the "Purchaser" in the contract.

The design and construction of the 120' yacht shall be in accordance with the following specification and GA Plans. If any discrepancy is found between the technical specifications and the attached General Plans the specification shall prevail, but in any case such discrepancies shall be drawn to the attention of the Owner.

Where the word "or" is used in the specifications this shall indicate that use of alternative items shall be permitted, "at the Builder's option".

Except for those items of equipment specially stated here-after as being supplied by the Owner, the Builder shall supply all items necessary for the normal operation and safety of the yacht as per this specification.

### 0015 GENERAL DESCRIPTION

The yacht shall be of the planning type with a proven "Modified V" shaped hull of the planning type powered by triple engines connected to triple jet drives.

This yacht shall be designed and built in accordance with RINA Rules and Regulation as well as MCA Code for short range.

The Builder : ISA Produzione srl-Ancona  
Exterior designer : Andrea Vallicelli  
Interior design : Cristiano Gatto  
Naval Architecture : ISA Shipyard Ancona

All the materials used and works carried out shall be in conformity with the ISA shipbuilding standards for this class of yachts.

The shipyard can change the equipment mentioned in the following specification with equivalent type subject to consultation and approval by Owner's representatives.

The construction shall be of light weight composite with cored sides; the structure shall be reinforced by appropriately spaced transverse frames as well as longitudinal girders which will run longitudinally as extensions of the engine foundations.

The yacht shall have three decks:

- Lower Deck
- Main Deck
- Sun Deck

The deck height will generally allow a headroom, wherever possible, of 2,05 meters from floor surface to usable ceiling also in the way of ceiling lighting, ventilation diffusers, structures, etc.

## **0020 ARRANGEMENT**

The vessel's accommodation shall be as follows:

### **Guest area:**

- Master stateroom
- Four guest cabins

### **Crew area:**

- Two crew cabins
- One Captain cabin

## **0025 MAIN CHARACTERISTICS**

### *0025.1 Main data*

The following dimensions are approximate and shall be optimised by the Builder during the Architect's design and engineering phases.

Any machinery performance data reported in this article comes from the tables provided by the manufacturer.

The speed values and the displacement may vary depending on the final layout and equipment requested by the Owner.

The Owner shall be informed by the Builder of any differences at the earliest possible moment.

LOA	36.45 m
LWL	29.90 m
Moulded Beam	7.40 m
WL Beam	6.70 m
Moulded Depth	3.614 m
Design Draft at Full Load	1.50 m
Light Ship Weight	134 tons

Displacement at Full Load	169,5 tons
Displacement at Half Load	153 tons
Fuel capacity	22.000 litres
Fresh Water Capacity	4.000 litres
Gray and Black water Capacity	3.800 litres
Bilge tank Capacity	650 litres
Sludge/ Dirty oil capacity	600 litres
Main engine type	2x MTU 16V 2000 M93 (Lateral) 1x1790 KW @ 2450 rpm 1x MTU 16V 2000 M93 (Central) 1x1790 KW @ 2450 rpm
Lateral Jets	Kamewa 71 SII
Booster Jet	Kamewa 56 BII

### 0025.6 Speed and range

The yacht at half load condition with the engine/drives as specified above shall be capable to run at the maximum speed of 33 knots and a cruising speed of 27 knots at half load condition.

The half load displacement ( or trial displacement) is hereto detailed:

- Lightship weight
- 9.5 tons of fuel oil
- 2.0 tons of fresh water
- 2.5 tons of crew/passengers and effects
- 0.5 tons of lube and hydraulic oil
- 4.5 tons of provision and ship store (including garage tender and wave runners)

Sea trials will be conducted in a wave height of less than 0.5 meter and wind speed less than 6.0 knots (corresponding to a Douglas sea state 2 and Beaufort wind state 2).

The range at cruising speed of 27 knots at trial displacement will be 550 nm, considering the total fuel capacity and one generator running at 70% of the load.

### 0030 SUPERVISION AND INSPECTION

The yacht shall be constructed and equipped under the supervision of the Classification Society's and the Owner may nominate a Supervisor if he requires.

The scope and authority and responsibility of the Owner shall be in accordance with the terms of the Contract and shall include the right to reject any workmanship and/or equipment which does not meet the requirements set forth in the Technical specification and contractual drawings.

The Owner's Supervisor will have access to the Builder's and Sub-contractor's workshop, where the work is being carried out, during the normal working hours. Access outside normal working hours shall be by arrangement. A suitably furnished office shall be provided in the Builder's premises



during the construction of the yacht, at Builder expenses with telephone/e mail and fax facilities. (Communication charges to be invoiced at cost).

The Builder shall provide the Owner of 24 hour notice of inspections and tests. Should the Owner's Supervisor not attend those inspections and tests, then they shall be completed and shall be deemed to be accepted as if he was present.

#### **0040 CONSTRUCTION PLAN**

Prior to starting work, the Builder shall submit the relevant Class plans and system schematics to the Owner and the Classification Society for approval from time to time according to the course of designing and construction schedules.

The construction technical documentation shall consist of all the Class drawings, calculations and certificates needed for the construction, the classification and the registration of the yacht.

One copy of the following engineering and arrangement drawings for operational purpose will be supplied to the Owner at the delivery of the yacht:

- General Arrangement Plan
- External profile
- Capacity plan and watertight compartments
- Manholes arrangement
- Bilge and fire fighting system
- Sea water cooling system
- Air vent
- Tank levels and sounding pipes
- Scupper system
- Fuel oil system
- Hot and cold fresh water system
- Compressed air system
- Lube oil system
- Bow thruster arrangement
- Black and grey water system
- Engine-room arrangement
- Engine exhaust systems
- Generator exhaust systems
- Shafting arrangement
- Electrical wiring diagrams and cable list
- General lay-out of electric switch board and distribution panels
- Antennas plan

- Life saving plan
- Fire detection plan
- Fire Control Plan
- Engine Room Fixed Fire Extinguisher system
- Docking plan
- Engine room ventilation
- Air conditioning system
- Painting specification + data sheet

#### **0045 DELIVERY DOCUMENTATION**

During the course of construction of the yacht the Builder shall fully co-operate with the Owner's Surveyor and make available all information and documentation relevant to the yacht.

At the handover of the completed yacht the Builder shall deliver to the Owner:

- One set of drawings as detailed in section 0040, including a CD Rom
- The certificates for all materials and equipment items as required by R.I.NA.
- The Stability Booklet.
- The compass deviation chart
- Complete original manufacturer's manuals, handbooks, drawings and spare parts lists as hard paper copy.
- A complete list of all major items of machinery, equipment and outfitting specifying model and serial numbers, guarantees and contact details of suppliers.

#### **0050 MODIFICATIONS**

The Builder shall have the option to change, without notice, elements of the construction of the vessel and its components, should they become non available or should the Builder, through his experience, decide to execute modifications to achieve an higher level of safety and comfort of the vessel.

The Owner may request in writing any reasonably practicable modifications, which don't imply significant deviation from the basic design and the following specifications and does not affect production schedule.

The Builder will assent to such modifications provided that:

- They have been requested prior to the purchase of materials
- They have been requested prior to the execution of the work affected by such modifications and the delivery time is not affected by such request

## 0055 SOUND PROOFING

Particular attention will be given to minimize noise and vibrations to avoid any damage to the hull-structure and equipment, and to improve the comfort on board.

The main design criteria to reduce noise and vibration shall be as follows:

- Provide adequate scantlings, continuity of foundations of the main engines and reduction gears
- Select machinery compatible with the noise targets
- Mechanical installations on resilient mounts
- Install adequate silencers at exhausts gas systems
- Insulation of engine room

Noise levels shall be measured with yacht completed and outfitted in any parts, and in the following three conditions:

### Condition 1

Underway at cruising speed with:

- Sea state 2 of Douglas scale and a wind speed not exceeding 6 knots;
- Main engines running at 75% of power
- Mechanical ventilation in operation at high speed
- Air conditioning set to a low speed

### Condition 2

Dockside/ at anchor, with:

- Sea state 2 of Douglas scale and a wind speed not exceeding 6 knots;
- Main engine stopped
- Air conditioning set to a low speed
- Mechanical ventilation in operation at low speed
- One generator running

### **Noise levels dB(A)**

The following noise levels target shall be considered during the design phase for the above conditions:

<u>Location</u>	<u>Condition 1</u>	<u>Condition 2</u>
Crew cabins	75	55
Crew mess	75	55
Main galley	75	55
Guest cabins	70	50
Owner's cabin	63	50
Main saloon	70	55
Wheelhouse	65	55
Exterior main deck aft	85	65
Sundeck area	80	65

During dock and sea trials, a specialist firm shall take measurement of the levels on board and shall produce a detailed report.

## **0060 TANK TESTS**

The vessel's hull shape shall be thoroughly tested in an accredited tank testing facility. Tests shall include towing at various displacement, as well as transition and planning speeds at various pertinent load conditions.

## **0065 WEIGHTS**

When fully commissioned, with all equipment on board, the yacht shall afloat evenly on her lines at trial displacement. The Builder shall be allowed to place on board up to a maximum of 2,0 tons of lead ballast for trim and list angles adjustment. This amount will not alter the performance of the yacht.

## **0070 DELIVERY**

After the satisfactory conclusion of the sea trials and the final completion of all construction activities on board, the Owner shall take delivery of the vessel and all care and responsibility of the vessel shall fall upon the Owner.

Any defects which may develop or become apparent during the tests and trials shall be made good by the Builder.

All tanks, storage spaces, bilges, accommodations and other spaces will be clean and thoroughly cleared of all damage and dirt. Particular care shall be taken that all inside surfaces in tanks, pipe systems and machinery shall be clean and free from any foreign substances; all painted surfaces shall be touched up and cleaned, all machinery shall be in good running order: all equipment, spare parts and store shall be properly stored. After completion, the yacht shall be delivered to the Owner afloat at the Builder yard in seaworthy condition.

Any unused fuel oil and or special lubricants that are left over after the trials shall be purchased from the Builder by the Owner at the Builder's cost.

The yacht shall be delivered completed in all respects and anything omitted in the specification that may be necessary for the operation of the yacht shall be included by the Builder except for those items of equipment specifically included in the list of items supplied by the "Owner".

## **0075 GUARANTEES**

The general terms of the guarantees shall be in accordance with the Contract.

The Builder shall make good any and all defects and mistakes, both during construction of the yacht and during the contractually agreed period thereafter after delivery to the Owner. All claims, arising from the guarantee, shall be rectified to the satisfaction of the Owner and at the expense of the Builder. The guarantee does not cover wear and tear from normal use; neither does it cover poor/insufficient maintenance.

To this purpose a defect list shall be prepared and agreed upon between the Builder and the Owner's Supervisor; after intervention planning has been made works will be started with yard specialists.

The Owner shall notify the Builder of any defects to be corrected under the warranty clause by using the Builder's standard warranty claim form.

The guarantee inspection and works shall be executed with workmanship and material at Builder charges; expenses for transport, food and accommodation at Owner's charge if executed out of Builder Yard.

At the end of the guarantee period and within 2 months, the Owner shall make the yacht available in at ISA Ancona such that the guarantee work can be carried out and signed off.

At this stage the Builder's guarantee commitments are deemed to be complete.

## **0085 HOUSEKEEPING**

The yacht and its immediate surroundings are at all times to be kept clean and free from any accumulation of debris and of vermin or insect infestation.

Prior to preparation for launching, the construction shall be carried out under permanent cover, keeping the yacht under construction and its components and materials at all times protected from weather conditions. The internal conditions and the available facilities must suit the requirements of the various aspects of the construction of a luxury yacht of the highest quality.

## **0090 MATERIAL**

All materials and items of equipment installed in or delivered with the yacht will be new and of first class yacht quality, suitable for the purpose intended.

Material will be used and/or fitted in accordance with the manufacturer's recommendations and care shall be paid to ensure material are not subjected to deterioration or damage while in storage or during construction.

All equipment shall be of the latest proved design, manufactured by well known international makers. Equipment will be capable of withstanding local ambient temperatures as defined in section 34, for long periods without effecting its efficiency.

Where the proprietary and company names are mentioned in the Specification they are not in all cases intended to be restrictive in furnishing the articles, but it shall mean that any item similarly equal in design, performance, material and suitability is not excluded, if the equivalence can be demonstrated.

Metals and metal alloys used in the construction of the vessel shall be subjected to the guidelines and regulations of R.I.N.A Classification Society and will include the following:

### Aluminium:

Aluminium plate shall be 5083 alloy or equivalent; aluminium extrusion shall be 6082T6 or equivalent.

### Bronze:

Silicon bronze castings shall be of suitable grade for any application.

### CuNiFe:

Where appropriate (i.e. sea water cooling system) Cu-Ni 90/10 alloys will be used.

### Mild steel:

Mild steel shall be in accordance with ASTM A36."

### Stainless steel:

Stainless steel shall be AISI 316L for exterior application. Stainless steel used for shafting shall be in accordance with Rolls-Royce specification to RINA class satisfaction.

### ***0090.1 Composites MATERIALS***

Composite materials used during construction entails the optimised use of E glass, aramidic (Kevlar) and carbon fibers in a ,vinylester and polyester resins matrix. Sandwich structures shall be laminated with balsa or PVC foams of appropriate densities in accordance to R.I.N.A Classification Society regulations.

### ***0090.2 Wood***

Wood materials shall be kiln-dried or fully seasoned below 12% moisture content and generally clear and free from knots, check or warps. Plywood shall be exterior or a suitable grade for the yacht's interior construction. All frame woodwork will be properly sealed.

### ***0090.3 Fasteners***

Fasteners are generally made in stainless steel or bronze. Aluminium, brass and/or nylon may be used in certain applications.

## **0095 WORKMANSHIP**

All workmanship shall be first class in every respect and in accordance with the best marine practice for a motor yacht of this size and type. The work shall be carried out by qualified and skilful workmen under regular and competent supervision.

All equipment and systems shall be installed in accordance with the manufacturer's recommendations, instructions and requirements. Exceptions shall be authorized by the manufacturer or their representatives with applicable warranties confirmed.

A high standard of cleanliness will be maintained throughout the yacht during the whole period of construction. Special care shall be taken that drain pipes and other locations, which are similarly difficult to reach at the later stages, are kept open and unclogged at all times. A regular cleaning schedule shall be strictly adhered to.

All finish work shall be thoroughly protected at all times, with particular attention given to the covering of materials that might be damaged by impact with tools, passage or other activities.

Wherever possible all work involving cutting or sanding shall be carried out off the vessel. Where it will be necessary to perform the work on board, measures shall be taken to minimize and extract dust.

The Builder shall provide suitable facilities and exercise proper diligence in connection with the storage, handling and installation of both Builder-furnished and Owner-furnished materials and equipment going into the yacht. Machinery and other components subjected to damage or deterioration from exposure to weather or excessive heat, cold or humidity, will be placed in suitable storage.

Attention will be given to manufacturers installation instructions as to both procedure and consideration to weather conditions.

Appropriate measure will be taken, where necessary, to keep a minimum wear and damage incident during the construction and to prevent corrosion or other deterioration, specially to unpainted, polished and moving parts.

## **0100 COMPLETE LIST OF OWNER'S SUPPLY**

- Consumable stores at delivery of the yacht in Ancona
- Fuel oil and lube oil, except quantity used for trials before delivery from Ancona
- Nautical publications
- Gold fittings and finishes
- Special pictures and knick-knacks
- Paintings, sculptures and works of art generally

## **0110 ALLOWANCES**

The Builder will incorporate in the contractual price the following PC Sum:

Euro	220.000,00	for Navigation & communication equipment (Sec.4210 and 4215)
Euro	240.000,00	for Entertainment (Sec. 4220)
Euro	50.000,00	for Interior Household appliances (Sec. 3830)
Euro	20.000,00	for tools and spares (Sec. 4430)
Euro	75.000,00	for tender and wave riders

The above PC Sum shall include the material, transport, ,custom duty and installation costs.

### **3105 HULL CONSTRUCTION**

The hull of the vessel shall be of Fibre Reinforced Plastic (FRP) construction producing a single, strong and durable structure. The exclusive use of the composite materials in the manufacture of the hull offers benefits in terms of improved thermal and noise insulation, resistance to corrosion, strength and less maintenance. Composite construction shall provide an excellent balance in terms of weight savings and vessel's performance and this shall be achieved through the use of state of the art construction techniques which have proven to be successful. Materials used for the construction of the hull shall be approved by the Classification Society.

#### ***3105.01 Hull Form***

Hull shape shall be of modified "V" shape with hard chine in order to have good sea-keeping and speed performance in all normal operating conditions. Dead-rise angle at aft section shall be approximately 14°. Twin continuous spray skates shall be incorporated in the hull design.

#### ***3105.02 Moulds***

The vessel's hull, deck and superstructure shall be laminated wherever possible on a female mould. Such moulds shall be constructed from a male plug built using laser cut Numeric Controlled frames. The mould shall be appropriately reinforced to facilitate handling and un-moulding operations.

#### ***3105.03 Hull Lamination***

Fibreglass construction shall utilize vinyl resins (3 external plies) and polyester resins and knitted bi-axial E-glass and aramidic fabrics as well as hybrid fabrics.

Bottom shall be monolithic while hull sides shall be cored utilizing balsa or PVC foam coring of appropriate density as required by the Certification Society.

The lamination plan shall be subjected to the Classification Society approval.

### **3115 TRANSVERSE FRAMES**

Transverse frames construction shall consist of knitted Biaxial E Glass fabric impregnated with polyester resin over PVC foam coring of appropriate density. Additional Unidirectional fibres shall be laminated on stiffener heads. Limber holes shall be incorporated at the intersections of frames and girders to allow proper drainage to the bilge.

### **3118 FLOOR BEAMS**

Floor beams construction shall consist of knitted Biaxial E Glass fabric impregnated with polyester resin over foam coring.



### **3120 LONGITUDINAL GIRDERS**

Two composite longitudinal girders for each engine shall run through the entire length of the engine room incorporating steel mounted plates in the way of foundations; four longitudinal girders shall be laminated in way of double bottom tanks area; two longitudinal girders shall run through the entire length of hull bottom integrating the engine girders.

Longitudinal construction shall consist of knitted Biaxial E Glass and aramidic fabric impregnated with polyester resin over foam coring. Longitudinal shall be fully bonded to the hull through use of composite materials in accordance with standard construction detail.

### **3125 ENGINE FOUNDATIONS**

Engine foundations shall be continuously connected to the longitudinal girders and shall be built to Classification Society requirements.

### **3125 WATER JET FOUNDATIONS**

Each Water-jet intake shall be moulded as an integral part of the hull. The intake tunnel attachment to the hull shall be in accordance with the approved drawings by Classification Society.

### **3130 STRUCTURAL BULKHEADS**

The watertight bulkheads arrangement shall divide the hull in six watertight compartments. Each compartment shall have its own bilge suction. Structural bulkheads shall be made in PVC cored laminated FRP and/or marine grade plywood of suitable thickness as approved by the Classification Society. Those shall be properly laminated to the hull and to the deck structure and, where applicable, to deck and superstructure.

In way of structural bulkheads penetrations the PVC cores shall be substituted by an approved high density filler material and the area shall be locally reinforced with additional plies of fibreglass fabrics. Penetrations for pipes, cables and ducts shall be of type approved by the Classification Society.

### **3135 DECK**

The vessel's main deck and superstructure shall be primarily constructed in a single moulded section bonded to the hull structure. This method of construction enables a finished structure with integral details, such as lockers with moulded in gutters, flush deck hatches, recessed drains and fuel filling station. The bond between hull, deck and superstructure will be at Classification Society satisfaction.

In way of deck equipment and in heavy loading areas, appropriate reinforcement shall be laminated as integral part of the deck. Such reinforcements shall be made in glass, wood, heavy density PVC coring material or metal.

At main deck level, openings shall be arranged in to allow the installation of large equipment. These openings shall be mechanically fastened and appropriately bedded utilising appropriate compound, then covered by a layer of teak with black rubber seams.

Where the deck is penetrated by cables, piping and ducting the openings shall be properly reinforced and made watertight at Class satisfaction.

On fore deck, an heavy reinforced laminated shall be installed as an integral part of the main deck structure, to permit a proper installation of anchor windlasses, chain stoppers and chain rollers. The windlass mounting area shall be recessed. The recess shall be clad / lined with stainless steel and fitted with permanent drains. A heavy wall stainless steel or FRP tube shall connect the anchor windlass base plate and the anchor pockets.

### **3140 INTEGRAL TANKS**

Tanks shall be generally, of composite construction integrated into the hull structure, to produce a strong and durable structure, as well as the advantages of maximizing the vessel's available tank capacities, and safety in the event of collision. Integral tanks shall also assure easy repair and less maintenance.

All tanks shall be baffled and structural tanks shall be internally protected with barrier coatings. Barrier coating are chosen per the specified use of each tank, aiding in the protection of the tank's inner surface and to prevent tank contamination. Each tank shall be equipped with manholes for inspection and cleaning and with metal fitting plates with fitting attachments for all plumbing.

All tanks shall be pressure tested to demonstrate structural integrity and watertightness.

In addition to the lamination system required by the Classification Society, the inner surface of all structural tanks shall be covered with two resin rich plies of chopped-strand-mat.

The general requirements of all tanks shall be:

- Fully accessible through a adequate number of oil-tight, round bolted manholes and through lightening holes in the internal swash plates; manholes shall be readily accessible from the lower deck accommodation floors
- Fitted with filling and vent pipes, connections for supply/return lines, sounding pipes, alarms and level switches.

The tanks arrangement shall be as follow:

- Two central fuel tanks
- One fresh water tank
- One grey / black water tank properly located to allow drainage from all areas
- One dirty oil/ sludge tank in the engine room.
- One new oil tank in the engine room
- One bilge tank in the engine room

In the hull bottom, transducer housings shall be bonded on solid core doubling plates for items such as the log(s), echo sounder, seawater temperature sensor, etc. Transducers shall be generally installed in watertight housings with bronze sea valves.

### **3141 SEA CHESTS**

Two hydrodynamic sea chests shall be provided in the engine room for supply sea water to the cooling systems of the main engines, generators and all other systems requiring cooling water.

The sea chest shall be integrated into the hull structure and shall be equipped with an inspection and maintenance hatch, located just above the maximum waterline.

A removable protection grill made in stainless steel shall be provided and fitted at sea chest inlet in accordance to naval practice and to not disturb the intake water flow.

### **3142 BOW THRUSTER TUNNEL**

A heavy wall FRP tubular section, shall be installed in the extreme forward portion of the hull. The installation of the bow-thruster will be in accordance with manufacturer specifications. The tunnel shall be supplied by the bow thruster manufacture, complete of Class Test Certificate.

### **3143 BATHING PLATFORM**

A bathing platform shall be integrated in the aft section of the vessel.

The bathing platform area shall be out fitted with the following equipment:

- Low level courtesy lights
- Cleats for mooring of tender and or jet-skis
- Opening hatch for shore cables (power, phone/data, television, water, etc.)
- Recess for hand shower with hot and cold water.
- Electro hydraulic swim ladder.

### **3144 BULWARK DOORS AND GATES**

Two bulwark doors of composite construction, on port and one on starboard side, opening outboard shall be provided.

At each upper end of the stairs to the swim platform a hinged/polished stainless steel gates shall be provided.

### **3145 WATERTIGHT DOORS AND HATCHES**

Aluminium or watertight doors shall be installed in watertight bulkheads where access is required and shall be approved by the Classification Society.

Watertight doors shall be or hinged either sliding type, according to their location. Open/close indication shall be displayed into the “Ship Alarm and Monitoring System with alarm in case of door open.

### ***3145.1 Deck Hatch***

Hinged, properly dogged aluminium hatch shall be fitted on the deck. Arrangement and details shall be in accordance with the Classification Society requirements.

### ***3145.2 Garage Door***

A watertight shell door shall be placed on the starboard side of the vessel for access to the tender garage area. The door shall be hydraulically operated and hinged on the top. Open/close status shall be indicated in “Ship Monitoring and Alarm System”. Design and details shall be subjected to Classification Society approval.

## **3150 MANHOLES**

Manholes shall be bolted on suitable gaskets to permanently withstand the same head as the tank or compartment served. Arrangement shall be such to permit periodic removal and subsequent closing to the original tight condition.

Each manhole shall be fitted with identification name, indicating tank number and its contents. In general manholes shall be located clear of working and access areas. Access to manholes shall be not impaired by pipe work, machinery, equipment, machinery seats, interior joinery, structure, etc. Manhole arrangement shall be designed to assure access to all parts of the tanks for cleaning and inspection.

## **3155 FREEING PORT**

Freeing ports shall be provided on port and starboard side in the bulwarks as required by Classification Society to meet the minimum free opening area. Freeing port shall be integrated into the bulwark structure.

## **3170 SCUPPERS AND DRAINS**

Scuppers shall be arranged to guarantee a sufficient drainage of water from the exposed decks.

All drains shall have a positive gravity flow and shall discharge just above the water level.

## 32 SUPERSTRUCTURE

### 3205 SUPERSTRUCTURE

The yacht's superstructure shall be constructed in Fibre Reinforced Plastics with PVC cores and local reinforcements utilising, wherever possible and functional, female moulds. The result shall be a single, strong, lightweight and durable structure. Exclusive use of composite materials in the manufacture of the deck and superstructure offers the benefits of an improved thermal and noise insulation, easy maintenance and reduced weight. The lamination and construction methods shall comply with Classification Society requirements.

### 3210 MAIN MAST

A goalpost space frame mast of aluminium alloy construction or FRP shall be stepped on the flying bridge and shall be suitably supported. The mast shall be complete with the necessary brackets and pedestal fittings for the following:

- Radar antennae
- Aerials and antennas for VHF, GPS, TV, etc.
- Signal lights
- Navigation lights
- Lightning rod

### 3225 EXTERIOR DOORS AND HATCHES

Exterior doors and hatches shall be weather-tight and shall be integrated into the hull and superstructure as indicated in the General Arrangement Plan and in accordance to Classification Society requirements, where requested.

In way of all openings additional laminate layers shall be added for local stiffening.

Water drains shall be connected to the scupper system. Under no circumstance shall the drains run off into the bilge.

General requirements for all weathertight external doors:

- Composite construction with adjustable hinges.
- For day-to-day use all doors to accommodation areas shall open and close lightly using normal marine quality hardware. In closed position all doors shall be faired with the surface into which they are installed.
- Doors with sensors for “open/closed” signalling on the screen as part of “Ship Monitoring and Alarm system”.

### **3225 MAIN AFT DECK DOOR**

At main deck level a sliding weather tight door will be provided as shown in the general arrangement plan, for access to the main salon. Tempered glass shall be utilised for the construction of the curved doors; frames shall be made in polished stainless steel AISI 316L. Operation of the door shall be manual by a polished stainless steel handle.

## 33 PAINTING AND INSULATION

### 3305 GENERAL INSULATION

Wherever necessary, hull and superstructures shall be insulated against sound and heat as necessary to achieve the acoustic and thermal performance target specified in section 0025 and 3610 respectively. The insulation of decks and bulkheads shall be also designed to include material and specification to meet the fire rating as per MCA and Classification Society requirements.

Particular attention shall be given to the sound proofing plan, using material and treatment appropriate to the location and nature of the spaces.

Main engines, generators and all heavy fast rotating machinery shall be mounted on resilient mounts.

The engine room ceiling, bulkheads and side walls shall be insulated as follows:

- 2x25 mm Firemaster Blanket 607, density 96 Kg/m<sup>3</sup>
- aluminium vapour barrier
- aluminium sandwich (1mm AA-0.1 core-1 mm AA)

### 3310 EXHAUST GAS INSULATION

Exhaust gas lines and silencers shall be covered with adequate thickness of heat resistant insulation covered with appropriate material.

### 3320 PAINTS AND COATINGS

Exterior surface treatment shall be “Gel-coat” polished to a gloss finish. Beauty lines and bands shall be painted with Awl Grip or equivalent paint system and applied as per standard application practice of the manufacturer according to the approved plan. Proper care shall be taken to prevent contamination during application.

Bands in the way of window lines shall be painted with dark colour (black or dark grey).

### 3365 EXTERIOR WOOD TREATMENT

Wherever needed, exterior wood shall be varnished so that ridges in the grain cannot be distinguished. Varnished woods shall be sanded sealed and varnished with Interlux 96 Schooner or equal varnish.

## **3370 COATING SYSTEM**

### **3370.1 Hull and superstructure**

The hull, the superstructure and in general all parts built in GRP will be finished in polished gel-coat.

### **3370.2 Antifouling system**

The hull bottom shall be fully sanded and painted with International Paints, black colour antifouling paint.

### **3370.3 Engine Room Finish**

All engine room and machinery spaces shall be primed and top coated with a white polyurethane paint system or equivalent.

All white paints shall be high gloss (closed surface) and heat resistant.

### **3370.4 Fuel Tanks**

GRP double bottom tanks will be coated with an adequate oil resistant paint system as per Classification Society Rules.

### **3370.6 Deck Locker Paint Treatment**

All exposed and/or visible composite surfaces such as deck lockers and hatches shall be primed with appropriate primer and top coated with a white polyurethane paint.



## 34 PROPULSION AND GENERATORS

### 3405 GENERAL

The main propulsion system shall consist of three marine diesel engines driving three water-jets through a shaft system and reduction gear-boxes.

The engines shall operate by diesel oil and will be designed to ensure the normal operating conditions of the yacht.

The two lateral gearboxes will drive a variable displacement hydraulic pump. Those provide oil pressure to operate the jet steering system.

The main ship electrical generation power system shall consist of two diesel generators and one shore connection.

Main engines and generators shall be resilient mounted so as to minimize noise and vibration.

### 3410 OPERATING CONDITIONS

All machinery and associated air and oil cooling water shall be capable of efficient operation when yacht is permanently listed 15 degrees either side or pitching 10 degrees longitudinally and when rolling up to 22,5 degrees from the vertical.

The machinery ratings are based on the following reference conditions:

Sea water temperature.	32 deg °C
Ambient air temperature	45 deg °C

### 3415 MAIN ENGINES

Three diesel engines MTU 16V2000M93 rated at 1790 kW at 2400 RPM ( two lateral and one central) shall be installed in the engine room. The engines will be flanged to a reduction gearboxes, ZF maker having the following data:

- Lateral engines: ZF 3060 RR 2,952:1
- Central engine: ZF 3060 RR 2,037:1

### 3420 MAIN GENERATORS

The vessel shall be outfitted with two (2) ONAN 50MDDCG by 55 KW generators, 380 V, 50 Hz 3 phase, 1500 RPM, resiliently mounted and installed with in sound shields. The system shall include wet exhaust, water temperature, oil pressure and hour meter indication, and start/stop controls.

The main specification of the generators shall be as follow:

Max rated power	55 kW
Rated voltage	AC 380 V , with electronic control
Frequency	50 Hz, with electronic control

Number of phases	3
Power factor	0.8
RPM	1500
Rating	Full load continuous
Insulation	Class H
Protection	IP 21
Screening	Grade N
Voltage constant	+/- 2%
Construction form	NEMA MG 1-22
Max intake air	45 deg. C
Intake sea water	32 deg C
Starting system	24 V D.C., isolated

A Power Management System (PMS) shall be fitted and used to control the load sharing, auto-start and shut down of generators.

Synchronizing facilities shall be provided and the two generators shall be capable of automatic parallel operation. Each main generator shall be capable of selection as stand-by unit and to be started automatically on blackout. The Diesel Generator Engines shall have their own independent protection systems so that in the event of high cooling water temperature, low lubricating oil pressure or over-speed they will fail to safe (shut down).

Cooling water piping shall be connected to the water pump of the engines. From the pump the water travels through the heat exchangers and is then injected into the exhaust line.

### **3425 SHORE CONNECTION**

A 100 Amp shore connector/isolation transformer shall be installed in the aft peak (port side).

The unit shall accept /380/400 VAC/50 Hertz. Output will match the yachts electrical system. The shore power switch board shall be incorporated into the main switch board. The main parameters of the shore power (current, voltage and power) shall be displayed in the Ship Monitoring System.

One 35 meter length (in one or two sections), 100 Amp, 380 VAC 50 Hz 3 phase black colour shore power cable of soft type shall be connected to the transformer. The cable will be stored in the aft peak and will be manually operated.

### **3430 WATER-JETS**

Twin KaMeWa 71 SII water-jet assemblies, complete of standard equipment as supplied by the water-jet maker shall be installed on port and starboard side of the engine room.

A single KaMeWa 56 BII water-jet, complete of standard equipment supplied by water-jet maker, shall be installed as booster on the centreline of the vessel, between the two lateral water-jets.

### 3505 GENERAL PIPING SYSTEM

The general requirements for all pipe works shall be:

- stress free installation on properly spaced support brackets and/or hangers.
- metal pipes shall be fitted into the brackets using rubber linings.
- non-metal pipe systems, which continue into the engine room shall, at about 200 mm before entering into the engine room, change to a metal pipe.
- all pipes susceptible to condensation, all hot and cold water pipes and all Freon carrying pipes shall be insulated; insulation shall not be discontinued in way of fixing brackets, hangers, elbows, T-connections, etc.
- installation with constant drops and straight runs avoiding sharp bends.
- all pipe bends shall have smooth radiuses; no mitred joints shall be fitted.
- generally pipe connections shall be flanged and fitted with expansion joints as necessary.
- watertight bulkhead- or deck penetrations shall be flanged or through the use of an approved fitting.
- Straub® or similar couplings will be fitted in tight places, provided that they remain accessible
- sight glasses shall be fitted in appropriate locations.
- shock accumulators in high pressure lines shall be fitted where necessary.
- all exterior portions of filling and vent pipes shall be in stainless steel, PVC or flexible rubber
- all overboard valves shall be of the screw-down-non-return type (SDNR) where practical.
- partially completed portions of the pipe systems shall be pressure tested prior to their being covered or hidden by subsequent construction.
- pipes shall be colour coded and marked, indicating contents and flow direction.
- handles and hand wheels of valves shall be painted in the corresponding colour.
- earthing straps will be fitted as appropriate

### 3515 PIPING MATERIAL

All plumbing shall be of approved marine type using non-corrosive materials appropriate for the intended application. All piping shall be arranged neatly and in good marine practice. All through hull fittings shall be chromed brass and/or fibreglass installed in accordance with R.I.N.A and Builders standard detail.

All plumbing valves for metal plumbing systems shall be marine type ball stainless steel, bronze or chromed brass valves.

For all fittings and valves a single source of supply shall be preferred. The same holds true for the supply of elastic mounts, flexible pipe hangers, rubber bellows and expansion joints.

Generally piping material used through the yacht will be on follow:

- Sea intakes: GRP
- Sea water: Cu-Ni 90/10
- Fresh water: Stainless steel in the engine room and polypropylene outside
- Black water: PVC
- Lubricating oil Steel
- Hydraulic fluid Steel
- Compressed Air Stainless steel AISI 316
- Fuel: Stainless Steel
- Drainage: Flexible nylon reinforced hose w. double stainless steel hose clamps
- Bilge : Cu-Ni 90/10 pipes with bronze or stainless steels valves and strainers.
- Fire main: Cu-Ni 90/10 pipes with bronze or stainless steels valves and strainers.

### **3520 PUMPING ARRANGEMENT**

The general requirements for all pumps shall be:

- flexible coupling between the pump and the electric motor, except for small pumps
- RAL9010 painting.
- installation wherever possible on flexible mounts in painted aluminium drip trays.
- flanged expansion bellows at all connections between pumps and pipe work or valves, with double clamped hoses acceptable for the smaller pipe sizes.
- pressure relief valve for each gear pump.

### **3530 BILGE WATER SYSTEM**

The vessel shall be outfitted with a central bilge system with one (1) 380 VAC 50 Hz 3 phase, bilge pump connected to a manifold to allow bilge water suction from any watertight compartment. The pump shall be cross connected to the fire system manifold.

Each bilge suction is connected to the main bilge manifold and shall be fitted with: an electronic level/ alarm sensor, a suction pipe with remote controlled valve, strainer and a non-return valve.

Two identical electrical self-priming centrifugal pumps shall be connected to this bilge manifold. One pump will be designated as main bilge pump, the other as fire-/deck wash pump ( see also section 3535). They shall be installed on/in a drip tray and shall be interchangeable through the use of valves.

### **3535 SEAWATER FIRE SYSTEM AND WASH DECK SERVICE**

The fire pump ( see section article 3530) will draw its water via a strainer from the sea water cross-over line and shall feed the ship's fire main where, at strategic locations, the fire hydrants are fitted. At the main deck level, there will be an International Shore Connections as part of the fire main.

Eight fire hydrants with flexible hoses at deck lockers in the direct vicinity of the Storz® valves, shall be connected to the fire main:

- One in the engine room
- One in garage area
- One in crew accommodation area
- One at the foredeck
- Three on main deck level: one each on port and starboard and one on the aft deck
- One on the sun deck

Each hose shall be fitted with a nozzle (jet/spray and shut off device) and shall be stored in a non-corrosive rack.

The fresh water deck wash valves shall be installed next to these in the same recesses.

The fresh water deck wash line shall be separate from the domestic fresh water line . The two lines shall be fed by two high pressure / high volume pumps.

The Builder shall supply two wash down hoses with proper couplings and adjustable/variable spray nozzles, with a maximum of five fresh water hose connections, allowing the efficient washing down of the yacht.

### **3545 BLACK-GREY WATER SYSTEM**

#### Black water system

The vessel's black water waste removal system shall consist of Tecma toilets suitably plumbed to a central black water system. Toilets shall discharge into the Hamann® black/grey water collection tank following treatment the effluent shall discharge directly overboard. The Hamann tank shall be equipped with a pump that can also be switched automatic/manual/off. The discharge system shall include a shore discharge connection at the stern.

The grey/black water tank shall have its own vent and a tank alarm for high level with automatic pump start-up at 90% full. The vessel's black water system shall be plumbed with PVC and CPVC.

The general requirements for the black water (sanitary discharge) plumbing system shall be:

- Only large radius bends or 45° T-fittings shall be allowed. Tight bends shall be avoided at all times.
- Vent pipe(s) shall be fitted with active charcoal filter(s) to prevent smells on the exterior decks.

#### Grey water system

The vessel's grey water system shall collect water from sinks, showers, and bath tubs into a grey and black water tank.

The grey/black water holding tank shall be vented and equipped with a high level tank alarm.

The vessel's grey water system shall be plumbed with PVC and CPVC, and all grey water drains shall be plumbed with "P" traps.

## **3550 FRESH WATER SYSTEM**

Fresh water shall be contained in structural tanks of a total capacity of 5.000 litres which shall be properly vented outboard.

Filling shall be through appropriate filling boxes fitted on deck on port and starboard side. Port and Starboard direct fresh water shore connection shall be fitted in the aft end of the vessel plumbed to the fresh water distribution manifold. The shore connection shall be fitted with a pressure regulating valve.

Fresh water tanks shall be fitted with remote level gauges connected to the ship alarm and monitoring system. The tank shall also be fitted with sounding plug.

The fresh water supply system shall include two (2) fresh water pressure pumps, 380 VAC 50 Hz 3 phase with line voltage pressure switches and gauges and one (1) pressure tank. The system's pressure shall be provided by one pump with the second pump on standby. At peak demands, the standby pump will assist the primary pump.

Freshwater pumps shall be located on a suitable foundation in the engine room.

Freshwater lines from tanks to pumps and from pumps to various outlets shall be arranged in neat and accessible spaces with piping and fittings of suitable size.

All system plumbing shall be zoned to facilitate isolating areas for service without inhibiting the rest of the yacht. Fresh water tanks shall have high and low level alarms. A softner shall be installed on the shore connection line.

The system shall include:

- A particle filter in the distribution manifold
- An activated carbon filter in the distribution line
- A silver ions sterilizer/injection system.

### **3550.1 Hot Water**

The hot water supply system shall include two (2) 380 VAC, 150 litres water calorifier with pressure relief valves installed with all necessary suitable material pipe and fittings, valves and insulation. The system shall include two (2) 220 VAC 50 Hz single phase, or equal, circulating pumps. All hot water system plumbing shall be of suitable material and hot water lines shall be properly insulated.

The hot water plumbing will be laid out as a ring line with a circulation pump, providing near instant hot water at each tap. To preclude any bacterial growth there shall be no dead ends in the plumbing system and branch lines shall be kept as short as possible.

Boilers and hot pumps shall be located into the forward technical space.

### **3550.2 Desalination Plant**

The vessel shall be equipped with a one (1) Idromar or equivalent reverse osmosis fresh water maker and water treatment system of approximately 5,500 litres per day.

A permanent flushing line from the fresh water pressure system shall be fitted. Brine and reject product shall be discharged overboard via a dedicated skin fitting with SDNR valve fitted above the

waterline. All seawater pipes shall be in CuNiFe. The product water shall be plumbed into the fresh water transfer/distribution manifold.

### **3555 COMPRESSED AIR SYSTEM**

A compressed air system for ship's systems shall be supplied and fitted in machinery space. This system shall be fitted with all essential water traps, filters and controls.

One Sperre® air compressor shall be provided complete with all necessary valves, pipes, fittings, pressure switches, safety valves etc. Pressure-reduction shall be fitted to assure adequate capacity to navigation air horn, general users and quick connections located in the engine room, tender garage (1) , fore peak (1) and aft peak (1).

A 100 litre galvanized steel pressure tank shall be Class certified and shall be not integrated with the air compressor.

### **3560 FUEL SYSTEM**

The yacht will have two fuel filling stations, one on port and one on starboard side. The system shall be suitable for gravity filling. Fill stations shall be fitted with drain lines to the sludge tank.

Each fuel tank shall be equipped with a electronic level sensor. Sensors shall be programmable-multiple-output type to permit high level and low level alarm signalling. The sensors shall be interfaced with the ship alarm and monitoring-system, so levels/volumes will be displayed in a dedicated page.

#### ***3560.01 Fuel Filtration***

Filtration for each main engine shall be through type Separ duplex fuel filters/water separators, as supplied by MTU. Inlet fuel pressure to the engines shall be in accordance with engine manufacturer requirements.

#### ***3560.02 Fuel Purifier***

One self cleaning centrifugal fuel purifier shall be installed in the machinery space with discharge into the sludge tank.

An Alfa Laval® model PA 610 purifier with a capacity of 1600 litres/hour shall be fitted. The separator shall be plumbed to facilitate that all fuel drawn from a bunker tank and passing through the separator, can be transferred either to the aft fuel tank or to same bunker tank. The separator shall be fitted with a by-pass. Installation shall be on a deep drip tray with a permanent drainpipe to the sludge tank.

### **3570 ANTIFOULING SYSTEM**

A Cathelco anti fouling system shall be fitted to the sea chests.

## **3575 MAIN ENGINE EXHAUST SYSTEM**

The main engine exhaust systems shall be designed to engine manufacturer's requirements to keep the engine backpressure within the limit. The system shall be resiliently mounted, contain expansion bellows and all hot sections fully insulated without the use of metal shielding, and installed so as to allow for access to all flanges. Exhaust piping shall be made in stainless steel, Cu-Nickel Alloy 90/10 and/or fibreglass.

The exhaust lines shall be manufactured by the Builder and shall be connected to the MTU<sup>®</sup> exhaust outlet flange, by a stainless steel expansion joint.

The entire exhaust system shall be connected to the deck structure through rubber mounts.

The main engine cooling water lines shall be fitted with regulating valves, allowing manual control over the exhaust gas temperature and back pressure.

The general requirements for the installations shall be as follow:

- All cooling water connections through flanged reinforced rubber bellows.
- Combustion air will be drawn from the engine room.

## **3580 SEA WATER SYSTEM**

The vessel's sea water supply system shall consist of two (2) sea chests which are connected through a cross manifold. The dual chest arrangement allows sea water to be taken in from both main engines, generators, water maker and fire pump. Sea chests shall be of GRP construction with Cu-Ni 90/10 pipes. Except for the main engines and fire pump all auxiliaries sea water intakes line shall be fitted with easily accessible individual strainers with 316L SS baskets. All sea water intake lines shall be also fitted with a shut off valve and a non return valve. All plumbing and valve handles shall be label and colour coded for contents and colour code table provided and mounted. All labels, fasteners, hoses, primary wiring, placards, etc. shall be masked and free of paint.

The emergency fire pump and the refrigeration unit shall have a dedicated intake/strainer arrangement, located in the garage area.

On the cross-over-manifolds there shall be two 2" spare connections with valves and couplings for connection water supply hoses for use when the yacht is in dry dock. “

### **3580.1 Strainers**

Strainers shall be placed in the water intakes and shall be accessible through a removable cover held in place by wing nuts. Size shall be appropriate for the total maximum flow required by the connected systems.

## **3585 GENERATOR EXHAUSTS**

The exhaust lines shall be manufactured by the Builder and connected to the ONAN<sup>®</sup> generator pipe. The main components of the system shall be:

- a steel exhaust riser supplied by the generator manufacture;



- high temperature resistance rubber pipe;
- fibreglass combined muffler/water-gas separator
- water drain pipe below the water level, provided with a NR shut-off valve
- exhaust gas outlet above the water line, provided with a shut-off valve

The entire exhaust gas line shall be subjected to manufacturer approval.

### **3590 LUBE OIL SYSTEM**

Engines, gearboxes and diesel generators shall be fitted with a quick connection fitting for filling and discharging of lubrication oil. Two (2) hoses of suitable length and size shall be provided; one for discharging dirty oil and one for filling. The system shall consist of two (2) dedicated pumps of 1,0 mc/h for new and dirty oil.

### **3595 HYDRAULIC SYSTEMS**

The two lateral gear boxes shall be supplied with PTO to drive the hydraulic pump to operate the Kamewa<sup>®</sup> hydraulic systems. Each system shall be provided with an independent power unit. A racked storage to carry spare hydraulic oil in plastic containers shall be provided as requested by the Class, having a capacity sufficient to refill at least one actuating system.

Generally equipment requiring hydraulic pressure oil shall have a dedicated power unit, which shall be located near the equipment it serves. Each power unit shall be installed in a high sided drip tray.

High quality steel pipe shall be the preferred method of connecting the equipment to the power pack.

## 36 VENTILATION AND AIR CONDITIONING

### 3610 AIR CONDITIONING

The air conditioning system shall be designed to provide internal conditions of 21° ( $\pm$  1°C) and a relative humidity of 50% under the following ambient conditions:

- Outside air temperature max. +35°C
- Outside air relative humidity max. 85%
- Sea water temperature max. +32°C

The heating system shall be designed to provide mean internal conditions of 21° ( $\pm$  1°C) and a relative humidity of 50% under the following ambient conditions:

- Outside air temperature min. 5°C
- Sea water temperature min. +10°C

The mean temperature shall be controllable from each individual accommodation space within a range of 8°C.

The system shall be designed to meet the following criteria:

- Maximum air speed in the duct shall be:
  - mechanical ventilation 6 m/s
  - natural ventilation 2.0 m/s
  - air conditioned 6-8 m/s
- Minimum fresh air rate shall be 35m<sup>3</sup>/hour per person for each living room.
- Galley and sanitary spaces, shall have a dedicated exhaust ducting.
- Grills and slots through which the conditioned air enters the accommodation shall be arranged to avoid uncomfortable drafts.
- All filters shall be accessible for cleaning .

Exhaust fans shall be provided in technical spaces to extract an adequate amount of air and to guarantee a proper air changes in the ambient.

The installation in joinery work of fan-coil units shall guarantee access for maintenance and disassembly.

The ventilation system shall be designed to have a slight positive pressure in each space except in the galley where pressure shall be slightly negative.

Isolation of chilled water pipes to individual fan coil units shall be possible through appropriate shut off valves.

The system shall mainly consist of a 380 VAC, 3 phase, 50 Hz reverse cycle marine chiller type, having automatically staged multiple condensing units serving the fan-coil units located throughout the vessel as well an air-handling unit located at foredeck.

The system shall be divided in zones to allow isolation of each unit for service, without inhibiting operation the rest of systems and shall feature:

- Independent electronic soft starts on condensing units
- Chilled water plumbing fabricated of copper material
- Chilled and sea water pumps driven by a 380 V/50 Hz/3p motor

### **3610.1 Marine Chillers**

The marine chiller package shall have capacity to maintain the required service at less than their maximum load; compressors will be hermetic type, with two self-priming sea water cooling pump, and two (2) chilled water circulating pumps.

### **3610.2 Fan Coils**

Each fan coil shall be 220VAC, single phase, 50 Hz, with trip drain, individual thermostats, treating outside air, complete with centrifugal fan, 2 or 4-pole electric motor, chilled water coil with copper tubes, air filter (renewable type), canvas vibration absorber at inlet/outlet, and electric control panel. Each fan-coil unit shall be provided with a 3-way valve.

### **3610.3 Air Handling Unit**

Two air handling units shall be installed for treatment of outside air and shall be complete with centrifugal blower, coolant coil with copper tubes, air filter, electrical heater and a dedicated electric control panel. The unit shall be automatically controlled by an electronic modulating controller acting on an electrically operated 3-way valve.

All the above components shall be also fitted in a dedicated box in a sound proof shield.

## **3620 VENTILATION**

The air intake system shall be designed to ensure adequate air circulation to all areas where machinery are installed and to keep temperature at acceptable limits during navigation.

### **3620.1 Engine Room Ventilation**

The engine room shall be mechanically ventilated with three supply fans and one exhaust fan with control switches on the main switchboard. All the fans shall be resiliently mounted and electric motor driven, reversible, and fitted with variable frequency drives.

The air flow required for ventilation (engine air consumption and heat removal) shall be in accordance to ISO standard, taking into consideration the maximum outside temperature as defined at section 3610. In any event, the supply and exhaust air ducting shall be laid out in such a way that outside air is circulated through the engine room leaving no hot spots.

Each fan and extractor to the engine room shall be fitted with an electrical operated fire damper, as per Class requirements.

Intakes shall be suitably arranged to prevent the entry of rain or spray.

### **3620.2 Living Quarters Ventilation**

Air extraction grills shall be located in the interior ceilings . Those shall be connected to a duct system which will extract air through appropriate fans.

### **3620.2 Galley Ventilation**

The galley shall be equipped with a range hood connected to an exhaust fan and complete of a removable stainless steel grease filter.

The extraction air design shall be generally in accordance with MCA and Class requirement. The main components shall be as follow:

- exhaust steel duct up to 5 meter from the range hood
- fire dampers at garage bulkhead penetration
- Remote fire damper shut-down switch

### **3635 INNER CASINGS**

Inner casings shall be installed on the engine room ventilation ducts. Casings shall be an integral part of the superstructures.

## **37 Deck Equipment**

### **3700 DECK EQUIPMENT**

All deck hardware used in the construction of the vessel shall be suitable for its intended use and shall be mainly fabricated of 316L stainless steel. All aspects of the exterior finishing and outfitting shall be to the highest standards. Special attention shall be paid that no corrosion potential or dirt collection points are created during the installation of deck equipments.

General guidelines shall be as follow:

- Installation areas shall be adequately drained
- Equipment shall be flush with deck, where practicable
- Stainless steel items shall be high gloss polished.

Where installation of equipment foresee use of adhesive bedding, 3M 5200 or similar shall be used. Equipment required to be removed for maintenance shall be specially considered.

### **3705 WINDLASSES**

The vessel shall be outfitted with an anchoring system with a capacity in accordance with Certification Society requirements. The anchor windlasses area shall be provided with adequate drain that shall lead to the anchor hawse pipes.

Two Maxwell VWC 6000 by 4.0 KW vertical electrical windlasses with a drum of 150 mm diameter shall be installed on foredeck.

Control of the windlass shall be by a portable control with four meter wandering cable. A watertight electrical socket shall be provided in the foredeck area; when not in use the control shall be stored in a small locker in the foredeck hatch structure. A spare control shall be provided by the Builder.

### **3710 WARPING CAPSTANS**

Two Maxwell VC4000 by 3.0 KW electric capstans with a drum of 145 mm diameter shall be mounted on the aft deck. Capstans shall be mounted so as to facilitate warping of the vessel with minimal interference to walkways and companionways. Capstans shall be operated via adjacent flush mounted fully sealed watertight foot switches.

### **3720 STEERING SYSTEM**

The steering system shall be integrated in the KaMeWa waterjet system. It shall be hydraulically powered through dedicated hydraulic pumps for each lateral waterjet and shall be electronically controlled.

The hydraulic power shall be supplied by hydraulic pumps that are flanged on the gear boxes PTO's.

### **3730 BOW THRUSTERS**

The yacht shall be equipped with a 50 HP electric bow thruster placed in a dedicated tunnel, integrated into the hull structure. The thruster motor shall be equipped with a frequency drive. A protection grill made in stainless steel shall be fitted to the tunnel in order to protect the propellers.

### **3732 INTERCEPTORS**

The vessel shall be equipped with hydrodynamic devices suitable for trim control by means of dynamic lifting vertical planes (interceptors) applied on the transom.

### **3735 ANCHOR AND CHAIN**

Two bow anchors of high holding power type of equal weight of 150 Kg shall be supplied and stowed in a bow anchor box integrated into the hull and fabricated in AISI 316L stainless steel.

Anchor cable shall consist of one length of 110 meter (for each anchor) of galvanized stud link steel chain of 14 mm, U.2 grade. An adapter piece with U2 stainless steel swivel shall connect the cable to each anchor shackle.

Each anchoring equipment shall include stainless steel devils claw, roller and chain stopper.

A stainless steel protective plate shall be provided around the stem to protect the hull. Anchor hawse pipe shall be of stainless steel construction and shall be fitted with two (2) water spray fittings for chain washing connected the sea-water fire system.

Anchors and ground tackle shall be provided and shall be stowed in dedicated area with all necessary hardware; chain end shall be attached to structural member through a safe quick release mechanism.

Chain shall fall through a spurling pipe and self stowed in a dedicated chain locker, located forward of the collision bulkhead with access through a watertight hatch.

The chain locker shall have a divisional bulkhead to provide separate and sufficient stowage to contain the port and starboard chains.

The spurling pipe shall be of stainless steel construction, suitably supported and positioned to provide satisfactory stowage of the chain within the locker.

### **3740 MOORING BOLLARDS**

Polished stainless steel mooring bollards of adequate strength shall be bolted to the deck through stainless steel bolts and backing plates. Location, shall be as follows:

- Four bollards on the aft deck: two on port and two on starboard side
- Four bollards on the fore deck: two on port and two on starboard side
- Four spring-line bollards integrated into the fairleads: two on port and two on starboard side
- Two small bollards at the swim platform for tender mooring

### **3745 FAIRLEADS**

Stainless steel fair-leads, fabricated of polished AISI 316L stainless steel, shall be installed wherever necessary to prevent the chafing of mooring lines and to prevent damage to the exterior surfaces. Fairleads location shall be as follows:

- Four fairleads on the foredeck: two on port and two on starboard side
- Two fairleads on the aft deck: one on port and one on starboard side
- Four fairleads integrated with the bollards: two on port and two on starboard side

### **3755 LATERAL BOARDING LADDER**

A boarding ladder shall be installed on the starboard side of the yacht. The ladder shall be provided with self levelling teak steps.

### **3757 SWIM LADDER**

The vessel shall be outfitted with a stainless steel hydraulically operated swim ladder, housed in watertight casing, with control on the aft exterior deck.

### **3760 AFT GANGWAY**

The vessel shall be outfitted with a Sanguinetti® gangway of sufficient capacity to be integrated into the aft deck overhead for boarding. The gangway shall be electro/hydraulic type and shall be provided with an infrared control as well as a normal fixed control.

The aft gangway shall include the following features:

- Extension over the swimming platform of about 2.4 meter.
- Tilting capabilities (15° both up and down)
- Fibre optic lighting
- In the underside a recessed track for fitting the telephone cable
- Stainless steel automatic hand railings

### **3765 TENDER DAVIT**

A under deck davit shall be placed into the tender garage for launching and recovery the Owner's tender.

The Tender davit shall include the following features:

- Electric/hydraulic operation
- Capacity sufficient to handle a fully loaded boat with one crew.
- Sealed beam floodlight in underside crane.

### **3775 JET SKI COMPARTMENT AND HANDLING**

Two lateral jet ski compartments, properly drained shall be built in the aft side of the yacht (one port and one starboard side). Door shall be flush with hull and hydraulic operated. Launching shall be by means of an under deck davit which shall be provided with a safety stainless steel hook. Control of the crane shall be by a fixed panel as well as by a portable panel with a wondering cable.



## 38 INTERIOR OUTFITTING

### 3805 INTERNAL ACCOMMODATION

The motor yacht is developed on three decks: lower deck, main deck (on the same level as the external cockpit) and sun deck.

The General Arrangement Drawings are intended to give an indication of the allocation of spaces for the different functions and use. Adjustments and optimisation may be necessary during the design and engineering phase.

The interior furniture and cabinetry shall be built of high quality veneered panels and solid hardwoods. Interior colours and materials and layout shall be as selected by the Owner from selection of ISA standard yacht interior finishes and materials per such category of yachts.

Modular cabinetry seams shall be hidden in express joints, and all fastenings shall be properly aligned, as standard practice.

All lock sets and cabinet closures shall be of the highest quality hardware, secure and rattle free and shall remain so in heavy weather conditions.

### 3820 FURNITURE

- All furniture items shall be provided as shown on the General Arrangement Plan, Detail Drawings and concept Visuals, that shall be developed by the Builder and subjected to approval by the Owner
- Fiddles shall be applied to top surfaces where appropriate.
- Where required, the joinery work shall be modified to allow for air conditioning grills.
- The insides of cupboards and wardrobes shall be finished in a manner to match to the exterior and shall include drawers, hanging rails, shoe racks, shelves, racks, bookshelves and built-in provisions for TV, video and hi-fi.
- All wardrobes shall have automatic interior lighting.
- Furniture shall be securely fixed to bulkheads or cabin soles.
- Any loose or freestanding furniture shall have securing arrangements for use at sea.
- All loose furniture items shown on approved architectural drawings shall be included in the Builder's contracted scope of delivery.

### 3820 CEILINGS

- Ceiling panels shall be flush and easily removable where practical.
- Ceilings shall conceal all ducting, cables and other services where necessary.
- No fittings or fixtures shall be installed on ceiling panel joints.
- A "raised ceiling" shall be higher than the minimum headroom values.
- Except where indicate below, blinds shall be manually operated and installed as per architectural drawings.

- Electrically operated blinds, curtains and/or screens shall be provided in owner's suite and main saloon.

### **3830 HOUSEHOLD APPLIANCES AND OTHER EQUIPMENT**

The list is indicative of the equipment required. The Builder shall submit to the Owner's Surveyor the final list for approval.

The appliances shall generally be of the best professional quality. They are to be installed in such a manner as to readily permit service and maintenance. Care shall be taken that sufficient ventilation and air discharge facilities are provided for those equipment items that require good ventilation.

All appliances and refrigerated compartments shall be suitable for standard "Gastro Norm" trays.

The water supply to espresso machines, icemakers and hot taps shall be fitted with in-line filter elements to insure the best possible water quality.

The specified models and types establish the standard and complexity that is intended but may be subject to change as equipment manufacturers bring out new models and new technology. It is intended that the latest most up to date equipment, at the time of order, shall be installed. Prior to placing the orders with the suppliers, the Builder shall be required to present the equipment lists to the Owner for approval.

#### **3830.1 GALLEY**

- One Trash compactor ISE 8251
- One dish washer model
- One built-in oven model MIELE H4900 B
- One induction hob model BOSCH PKC 875 T01
- Two sink units model ALPES INOX VS 40/35-D with extendible water tap
- One custom built fridge FRIMECS (approx. 1060x600x2020)
- One custom built freezer FRIGONAUTICA MOD. CS115C
- One coffee machine model SAECO
- One microwave oven model MIELE 8161
- One stainless steel exhaust range hood ALPES INOX CFE A 80/2, connected to the exhaust ventilator, with removable stainless steel grease filters and lighting

#### **3830.2 OWNER'S AREA**

- MASTER safe HOKEY 10HE8010

#### **3830.3 CREW AREA**

- One ironing wends
- CAPTAIN safe HOKEY 10HE8010

#### ***3830.4 MAIN DECK SALON-BAR***

- One ice maker RARITAN ICERETTE MOD 85
- One mini fridge model FRIGOMAR ART.42

#### ***3830.5 EXTERNAL SUN DECK BAR***

- One mini fridge frigonautica FR80RC.
- One ice maker ANGELO PO PG23CW

#### ***3830.7 GUEST AREA***

- One mini fridge model FRIGOMAR ART.42

#### ***3830.8 LAUNDRY***

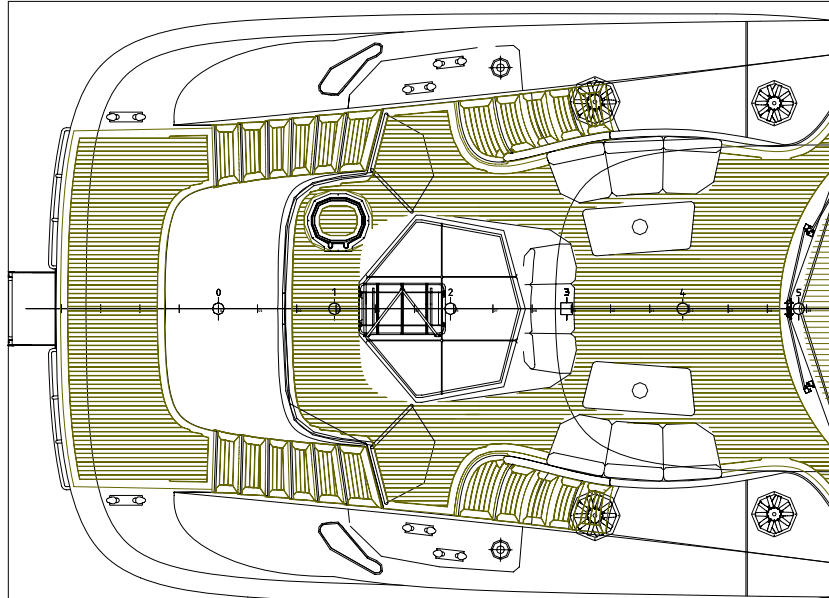
- One Miele® PW6065 washing machine
- One Miele® PT7136 dryer machine

All specified equipment shall only be ordered after technical review and subsequent approval by the Owner Supervisor

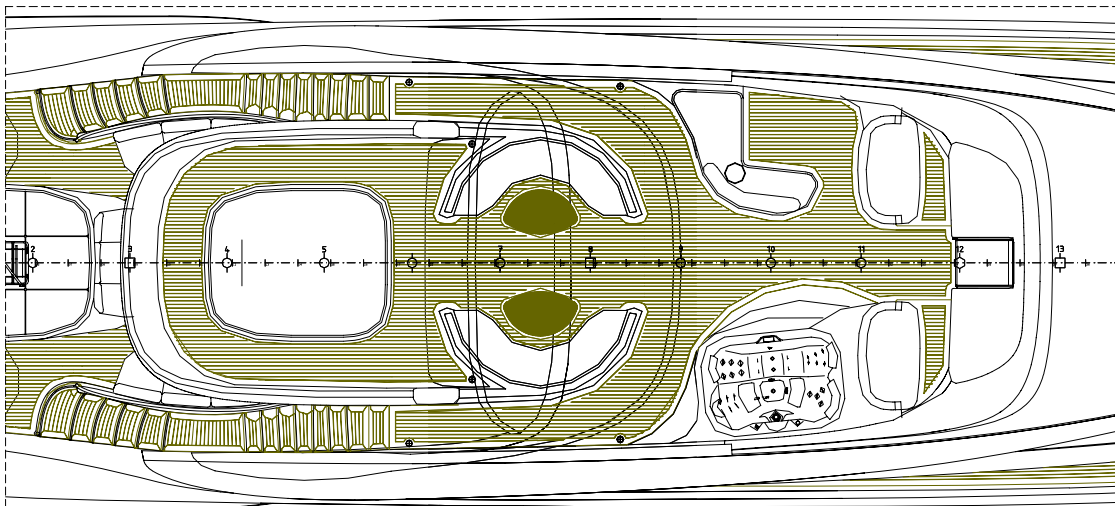
### 3835 ACCOMMODATION PLAN

The yacht's accommodation shall be divided between Main deck and the Lower deck with a raised pilothouse and full Sun deck.

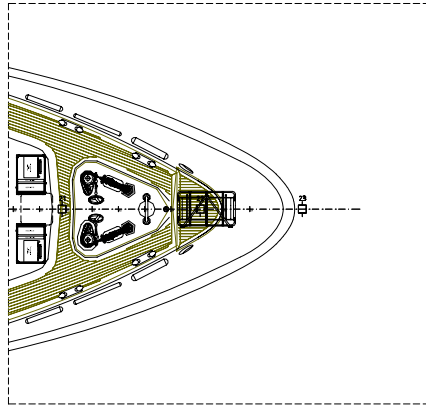
Access to the aft cockpit shall be from the dock via the aft gangway. The deck shall be equipped with a sunbathing area, and a seating area; direct access to the swim platform shall be through twin sets of stairs.



Direct access to the Sun deck shall be via two lateral sets of stairs.

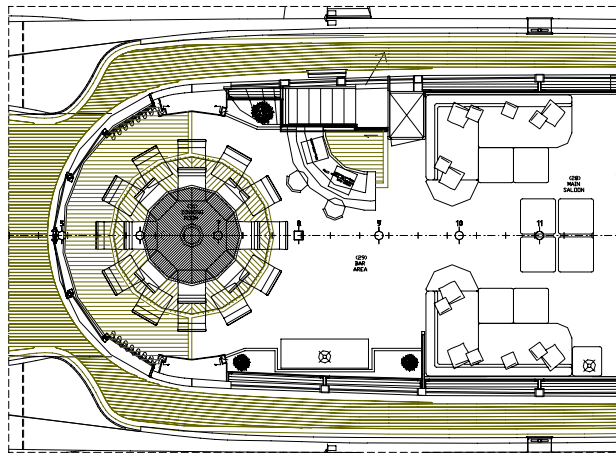


Port and starboard walkways shall connect the cockpit to the foredeck area. This area shall accommodate the anchor windlasses, the air handling unit space and the bow liferaft.

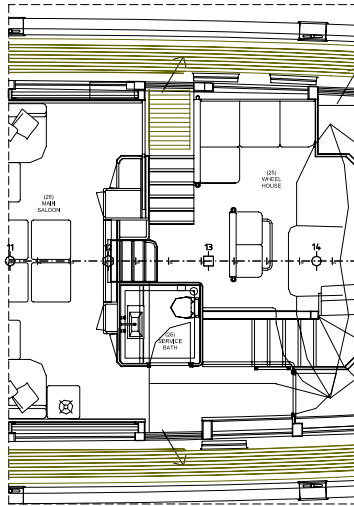


Access to the main saloon shall be through a large curved sliding glass door. A round dining table is provided at the entrance of the main saloon.

The saloon shall include a bar area with high stools, expansive sofas, built in cabinets and free standing furniture and shall include a complete entertainment centre. Windows shall be ample in size and number allowing for almost unrestricted external views.

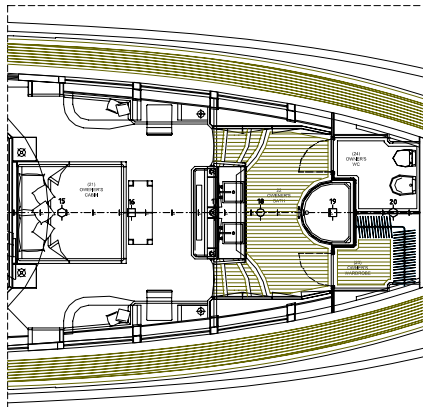


The forward end of the main saloon shall contain the raised wheelhouse area; access shall be through a sliding door and built in service stair. A weather tight door on the starboard walkway leads to the main foyer. A service weather tight door to the port walkway shall also be fitted on the opposite side, at the base of the wheelhouse stairs.



The Master stateroom shall occupy the entire forward area of the deckhouse. The suite shall be arranged on a split level with the living/sleeping area at the higher level and the bathroom area forward set at a lower level.

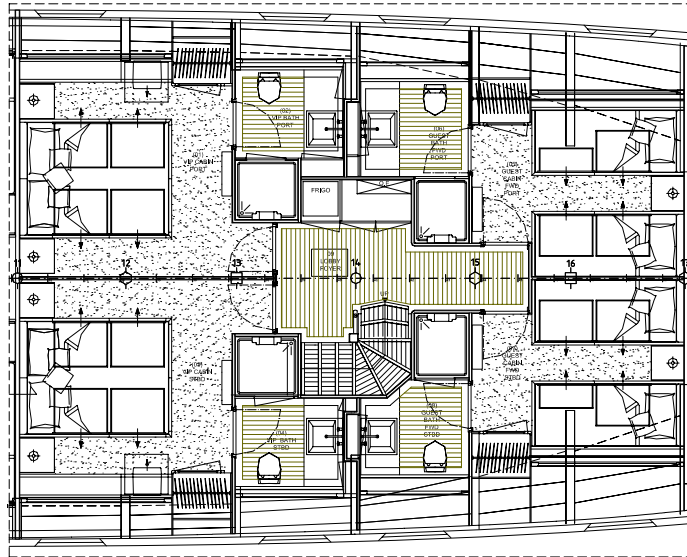
The living/sleeping area shall include a king size bed , desk area, sofas, entertainment area and cabinets. Windows shall run forward in harmony with the shape of the deckhouse and shall be appropriately tinted at Owner's requirement.



Access to the lower deck shall be through the main stairway located on the starboard side of the wheelhouse block. This stairway shall lead to the lower foyer where the two guest cabins (forward), and two double bed guest cabins are located.

The two forward guest cabin shall have two twin beds, closet and a bathroom with enclosed shower and a dedicated dressing area on the outboard side. Portholes shall be on the outboard sides.

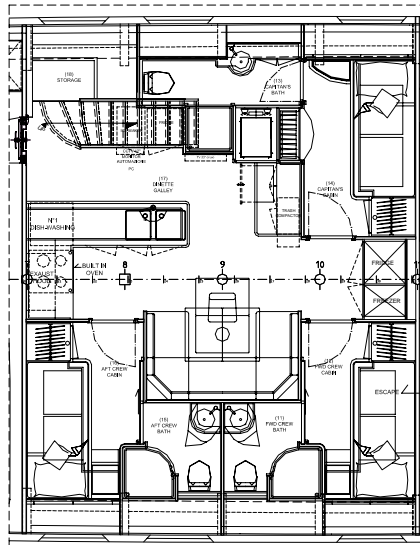
The two aft guest cabins shall have double bed, closet and a bathroom with enclosed shower. Those cabins shall also have appropriately placed portholes.



The aft portion of the lower deck shall include the crew area. Access to this area shall be through a stairway leading from the aft port walkway down to the galley. This stairway shall also allow access, via a double door, to the main salon, behind the bar area.

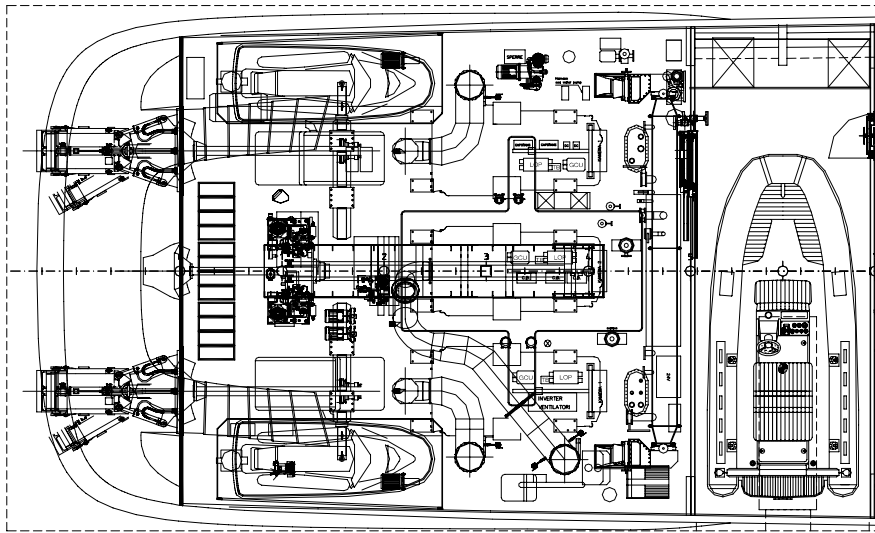
The galley shall include appropriate cooking, food preparation, food storage areas as well as a crew mess area.

Two crew cabins, each with upper and lower berths, shall be accessed from this area. Each cabin shall have a single bathroom. A captain cabin with one bed shall be arranged in this area.



Access to the tender garage shall be through a hinged water tight door. A dedicated space for washing machine and dryer shall be provided on port side of the garage area.

A water tight door is fitted providing access to the engine room. An aluminium hatch is fitted on aft starboard side at deck level acting as emergency escape from the engine room.



On the hull transom an hydraulic remote operated shell door shall be fitted providing access to the aft peak. The area shall be also used for crew storage. Two wave runners model KAWASAKI Ultra 150 or YAMAHA GP1300 shall be fitted on ship side. Launch and recovery shall be two dedicated cranes.

### **3840 GENERAL REQUIREMENTS FOR CREW CABINS**

The interior design of all crew areas shall be based on a single theme, with repeating details, generally in line with the yard standard.

### **3845 GENERAL REQUIREMENTS FOR LUXURY AREAS**

The interior design of the luxury areas shall be as per architectural drawings. Following, a listing of materials as an indication of what is to be generally expected:

- Cabinet work from the high quality timbers and veneers.
- Floors shall be covered with carpets.
- Wall coverings shall be timber, lacquered, fabric or mirrored.
- Portions of partitions and furniture from marble or granite shall be allowed providing they do not exceed the weight allowance.
- Ceilings shall be with removable panels; lacquered or covered with padded leather.
- Lockers shall be provided with hanging rods, shoe racks and shelves with fiddles.
- Dressing mirrors.
- Ticino® switches and outlets. Overhead and indirect lighting.



- Light fixtures throughout as per final architectural drawings.

### **3860 REFRIGERATION SYSTEMS**

The refrigerators and freezer compartments shall be custom built to maximize the use of the available space and to eliminate heat and noise in the accommodation areas. Each shall be served from a bank of independent compressor systems that are located in the garage area.

## **39 EXTERIOR OUTFITTING**

### **3905 TEAK DECKING**

Teak decking shall be applied to the horizontal surfaces of the main deck, and the transom steps and aft platform. Teak decking shall be of a minimum thickness of 8 mm with 50 mm wide waterways.

The deck shall be traditionally laid with king-planks, bevelled raised margin plank at the superstructure sides, covering planks around the perimeter and proper detailing around the equipment installed on the deck surfaces.

### **3915 PORTLIGHTS**

Portlights at lower deck shall be provided as shown on the external view.

Portlights shall be provided with polished AISI 316L stainless steel frame and deadlight and flush mounted aluminium frame integrated into the ship side structure. Deadlights shall be of removable type and stowed under the bed, properly labelled. Portlights shall have toughened glass, according to Class requirement and MCA Code.

### **3920 WINDOWS**

Windows shall be in tempered glass glued through the use of appropriate bonding compounds, to the fibreglass structures. Such structures shall be, wherever possible, recessed. Windows shall conform to the General arrangement plan and exterior profile plan, shall comply to Classification Society requirements.

All windows shall be of fixed type.

All windows, except for the wheelhouse, shall be tinted. Tinting shall be approximately medium grey and shall not be accomplished through application of film

The windows shall be made to carefully sized templates and have a black coating in way of the glue surfaces to protect the glue from disintegration from UV-radiation. The black coatings shall be accurately laid out on the patterns, so their surrounds will match.

### **3925 WIND SHIELD WIPERS**

Wind shield wipers shall be appropriately placed in the front windows of the wheelhouse. Controls shall be placed on the wheelhouse console.

Each front window shall be also provided with a water jet nozzle connected to a regulated water supply. The wipers system can be controlled by individual on/off/intermittent switches as well as through a synchronising mode. A single water switch is provided for the three front windows.

### **3960 SWIMMING POOL**

On the Sun Deck a four persons Jacuzzi pool shall be installed as shown on the GA plan. The pool with be provided with all necessary pumps, water and air jets, compressors, filtering equipment and underwater lighting. A structure made in FRP shall be built to accommodate the pool and its accessories. The deck area under the pool shall have properly insulated.

### **3975 HANDRAILS**

Railings shall generally be fabricated of 1 ¼“ inch diameter 316L stainless steel, highly polished showing no welds, markings or, bulges. Railing heights shall be in accordance with Classification Society requirements. Dimensions of rail tubing shall be uniform throughout vessel's exterior and final diameter subject to final exterior design style. Generally handrails and stanchions shall be 40 and 30 mm polished stainless steel respectively.

### **3980 SAFETY RAILINGS**

Removable safety railings of polished stainless steel in areas of high heat, and for personnel general safety shall be placed where needed. Railings shall be installed so as to be removable for maintenance.

## 40 SHIP EQUIPMENT

### 4010 SAFETY EQUIPMENT

The vessel shall be outfitted with the following safety equipment as required by Flag Administration and the MCA-Code as apply to the vessel's size and type.

All life rings shall be mounted with vessel name.

Two life rafts shall be installed out of sight on stainless steel or VTR retaining/launching cradles, which shall be bolted to the deck structure or otherwise fixed as required by MCA.

Lifebuoys, lifejackets, line throwing appliances, immersion suits and flares shall be in number as required by MCA according to Chapter 13, for short range.

The vessel shall be outfitted with four (4) 30" diameter MCA approved type life rings, located in appropriate bulwark recesses. Life rings shall be two (2) on the aft main deck, one (1) on the port passageway at wheelhouse base and one (1) on the starboard fly bridge.

The following equipments shall also be installed:

BELL SHIP	8" cast bronze, chrome plated, complete with mounting bracket, installed on mast
AIR HORNS	One Kahlenberg <sup>®</sup> Mod. T2, chrome finish, with 24 V control panel, including FOG Alarm. USCG approved and to MCA requirements
BOAT HOOK	Two (2) 1 ½" diameter , ten feet long aluminium pole
FENDERS	Eight (8) type Polyform F10 white/blue with 12 mm , 6 meter nylon line Four (4) type Polyform A6 white/blue with 12 mm , 6 meter nylon line Twelve (12) Fender hooks model MEGAFEND
DOCK LINES	Two 30 meter flexible laid braided nylon mooring lines, with leather covered eye splice, 32 mm diameter. Two 35 meter flexible laid braided nylon mooring lines, with leather covered eye splice, 32 mm diameter Four 20 meter flexible laid braided nylon mooring lines, with leather covered eye, 28 mm diameter One 100 meter towing line, 36 mm HT polyester, 3 strand Four monkey fist, each with 30 mt - 8 mmm dia. - polyester H.T. - 3 strand cable
ENSIGN STAFF	One jack staff in polished stainless steel shall be fitted at bow. The staff shall be provided with necessary sheaves, cleats and halyards for ensign..
FLAG STAFF	One ensign staff in polished stainless steel shall be fitted at bow. The staff shall be provided with necessary sheaves, cleats and halyards for ensign.

## **4015 FIRE EXTINGUISHING SYSTEM**

A fixed NOVEC 1230 type fire extinguishing system shall be provided in the engine room. The bottle shall be installed in a dedicated space above the main deck, on starboard side. The entire system shall be designed in accordance to the Classification Society requirements and MCA.

The activation the system shall be manual from a control release panel box located in an external locker at the engine room entrance, at the main deck level. Opening of the front panel of the box shall activate a sound/visual alarm in the engine room.

Prior to release the agent, a dedicated single switch shall be switched off to stop the engine room fans, to close the fire dampers and to stop the fuel pumps. The switch shall also activate the a visual and sound alarm in the engine room.

Labels with proper operation instructions shall be provided at fire control station.

A fire detection system shall be provided through the accommodation area and technical spaces. The system shall be inclusive of smoke/heat detectors, manual call point as well as electronics sirens. The engine room siren shall be also provided with a flush light.

A fire main system shall have a dedicated self priming fire pump and shall be plumbed with Cu-Ni 90/10 piping. A fire/bilge diesel driven pump shall be used in emergency.

## **4020 SPARE PARTS**

As yard standard practice, the Builder shall permit to Owner's Supervisor to select a list of machinery and equipment spare parts and tools for a total amount of Euro 20.000,00. This amount is exclusive of all spares and tools required by MCA and RINA for the certification of the yacht.

## **4025 NAVIGATION LIGHTS**

All navigational lights shall be from a dual power supply AC-DC rectifier and ship's emergency supply. Navigation light panel shall be located in pilothouse with individual indicator lights, circuit breakers, and audible/visual alarm for failure. A panel light shall indicate power supply in use either rectified or battery.

The vessel shall be outfitted with Aqua Signal series 55 navigational lights which shall include the following:

(2)	360°	Anchor	White
(1)	225°	Masthead	White
(1)	112.5°	Port Side	Red
(1)	112.5°	Starboard Side	Green
(1)	135°	Stern	White
(6)	360°	N.U.C.	Red

### **4150.4 Searchlight**

One (1) SANSHIN HR-1012 searchlight with 2x55 W lamp and pilothouse control, shall be provided by the Builder and fitted on the main mast.

### **4030 HULL NAME**

The name of the vessel and Port of Registry shall be applied to the transom in gold and black Awl-Grip or Dupont paint with font of Owner choice .

### **4032 NAMEPLATES**

The Builder shall fit nameplates in the English language of a suitable material at all control boxes, switches, valves etc. Nameplates shall be generally in aluminium, except if located on exterior decks, where shall be in plexiglass.

### **4035 INVENTORY LIST**

- 1x Castoldi Jet 16' tender
- 2x wave rider KAWASAKI Ultra 150 or YAMAHA GP1300
- 2x complete hi quality sets of towels (5 pieces each) for 10 guests
- 2x complete sets of towels (3 pieces each) for crew
- 10x large size beach towel
- 1x sets of covers for external cushions
- 2x complete sets of sheets for each bed
- 18x complete dining table place settings for guests
- 1x complete service of china (8 pieces each plus serving dishes) for 12 guests
- 1x complete service of silverware (8 pieces each plus serving tools) for 12 guests
- 1x complete service of glassware (6 pieces plus serving jugs) for 12 guests
- 1x service for crew including china, cutlery and glassware for 6 crew

## **41 ELECTRIC SYSTEM**

### **4105 ELECTRICAL SYSTEM**

The vessel's electrical system shall be designed in general accordance with Classification Society and MCA requirements for short range.

The vessel's AC electrical distribution system shall be 380 V 50 Hz 3 phase four wire system with grounded neutral.

Generally large power electrical motors shall be to 380 VAC, 3 phase, 50 Hz. Low power motors shall be generally 220 VAC single phase 50 Hz.

All motors over 1 KW shall be fixed on resilient mounts, except if otherwise indicated by the supplier; installation shall ensure good air circulation; all motors over 5.0 KW power shall have soft starter. The engine room ventilation fans and bow thruster shall be provided with frequency drive.

Electrical junctions shall be accessible for service.

The emergency circuits shall be designed to assure 3 hours running of emergency lights, navigation lights and radio equipment.

### **4105 DC SYSTEM**

The vessel's DC electrical distribution system shall be 24 VDC. Any 12-Volt services shall be locally equipped with 24/12 Volt transformers.

A dedicated switchboard shall be provided and located in the engine room, also including separate lines for 24 VDC of water jets and main engines. The 24 VDC line to water jets shall be provided with two 24/24 converters in order to assure a proper galvanic isolation. An isolation control device shall be provided in the DC switchboard.

### **4105 GROUNDING AND BONDING**

The vessel's bonding and grounding systems shall included copper straps secured to the hull and running the full length of the vessel parallel to centreline. Metallic elements shall be connected to the bonding strap using adequate wire, at Class requirements. The Builder will fix copper plates on the exterior of the hull under the water line so as they can remain wet at any ship movement: The following shall be installed:

- N°2 porous type plates, placed on aft starboard and port side, dedicated switchboard housing, HI-FI and TV system, MTU and KAMEWA, generators, stanchion and bollards, all metallic casings and electrical equipment supports.
- N°1 porous type plate, placed on the aft starboard side of sea chest, preset for the lighting rod system.
- N°2 of porous type, placed aft port side of the main sea chest, dedicated for navigation users and communication equipments.

## **4110 LIGHTING ROD SYSTEM**

The vessel shall also be provided with a lighting rod system as per Classification requirements.

A lighting rod shall be made in a golden brass and fixed on the main mast.

The lighting rod will be connected by an electric cable with a appropriate section to the dedicated earth plate. The cable connecting the lighting rod with the earth plate shall pass on starboard side of the roll bar going down to the plate without bending. This cable shall not have any interference with the other electrical cables.

## **4112 CATODIC PROTECTION SYSTEM**

All metallic ship fittings (sea chest, sea water piping, anchor windlass, anchor pocket, etc) shall have a dedicated galvanic protection line connected to two zinc anodes located on transom.

## **4115 BATTERIES**

All batteries will be of sealed maintenance free gel-type. The following battery banks will be provided:

### Main Engines Starting Batteries

Three banks of capacity as per MTU specification, charged by a dedicated battery charger. Battery and battery charge shall be located in the engine room, with changeover between the three banks.

### Generators Starting Batteries

Two banks of capacity as per generators manufacturer specification, charged by a dedicated battery charger. Battery and battery charge shall be located in the engine room, with changeover between the two banks.

### Emergency Diesel Pump Starting Batteries

One bank of capacity as per manufacturer specification, charged by a dedicated battery charger. Battery and battery charge shall be located in the garage area.

### Emergency Batteries

One bank of adequate capacity as required by R.I.N.A and MCA shall be charged by two dedicated battery chargers. This bank shall power the emergency services for 3 hours running. Batteries shall be located at sun deck; battery charge shall be located near to the pilothouse.

### Service Batteries

One bank of adequate capacity shall be charged by one dedicated battery chargers. This bank shall power all the 24 VDC auxiliary services. Battery shall be located in the ER ventilation fans space, while the battery charge is located in engine room. This battery bank will power the 24 VDC of the propulsion system.



### Radio Batteries

One bank of adequate capacity shall be charged by one dedicated battery charger. This bank shall be capable to power all the radio equipment for 6 hours running. Batteries shall be located at sun deck; battery charge shall be located near to the pilothouse.

### Battery chargers

Each battery bank will be charged by one battery charger with temperature sensors and diode isolators.

Battery charger voltage will be displayed in a dedicated page of the monitoring system.

## **4120 MAIN SWITCHBOARD**

The vessel's main switchboard shall be located in the engine room and shall be built and installed to Classification Society requirements. The switchboard shall have IP 23 protection and shall be designed to be functional with all necessary circuit breakers and transfer switches providing proper operation of all AC and DC circuits.

The general requirements of the main switch board shall be as follow:

- Full metal enclosure, painted in RAL colour 9010, fitted with ventilation openings, stainless steel protection bars over protruding items and an insulated handrail extending over the full width.
- The installed equipment shall be arranged in a logical easy to understand manner, be properly labelled and shall include but not be limited to the following items:
- Generator start/stop, running hours meter, synchronizer and load sharing units.
- Selector for manual-auto parallel operation of the AC generators.
- Shore power circuit breakers.
- Main bus bars.
- Circuit breakers for main consumers, outgoing groups, local distribution panels and spares.
- Bilge and fire pumps switching and running indication lights.
- The non-preferential load shedding system.
- Overload protection systems.
- Electric motor starters, as appropriate.
- Battery switches and condition monitoring equipment.

## **4125 DISTRIBUTION PANELS**

AC distribution sub panels shall be located to service designated areas of the vessel to limit wire weight. Ground fault circuits shall be incorporated. All electrical equipment shall be marked with engraved nameplates.

## **4130 WIRING**

All wiring shall be of good marine quality, of suitable size and type, neatly laid and run in aluminium cable trays fixed through a bracket system integrated into the deck structure. The electrical layout shall be in well-balanced circuits per Builder's schematic and/or detailed drawings.

Wiring runs shall be neatly aligned and fastened. All wiring shall be label coded at all terminations/panel and equipment. Wiring passing through watertight bulkheads shall include efficient means of ensuring watertight integrity of penetrations and preventing sound paths. Generally the water tight passage shall be realised with aluminium sleeves and filled with a Class approved compound type GEAQUELLO.

General requirements for all cables and wires shall be as follow:

- “Unbroken” runs except at clearly marked and easily accessible junction boxes. .
- AC and DC cables shall be routed on separate trays, where practicable
- No stacked multiple layers of cable shall be allowed, where practicable
- Special shielded cables to be used in all possible areas of interference and where required by the equipment manufacturer.

## **4150 LIGHTS**

### **4150.1 Interior lighting**

The general requirements of the interior lights shall be as follow.

- Light fixtures in crew- and working areas shall be as per yard standard
- Light fixtures in luxury areas shall be as per architectural proposal
- Switches and outlets shall be as per yard standard
- Strip lighting shall be as per architectural proposal.
- Lighting bezels and all other ceiling appliances (i.e. smoke detectors, etc.) will be to yard standard
- All 230 Volt AC in wet locations shall be provided with a Ground Fault Circuit Interrupter (GFCI).

### **4150.2 Exterior lighting**

The general requirements of the exterior lights shall be as follow.

- Overhead light fixtures shall be as per yard standard.
- Lighting bezels shall be in standard finishes.
- Overhead lights shall be: flush, 20 Watt, halogen, fixed in the deck heads over the side and aft decks. Lights shall be switched in groups.
- Courtesy lights shall be separately switched, fibre optical, fixed in the superstructure sides and recessed/hidden strip lighting at seat fronts, base boards of integrated furniture and stairs as per designer proposal.
- Working lights: shall have a separate switched, low level at the foredeck.

## **4150 EMERGENCY LIGHTING**

An automatically switched emergency lighting system, providing a minimum lighting level in the public and critical areas of the yacht, shall be installed. The fixtures shall be unobtrusive or where possible be incorporated in normal fixtures.

## **4155 MONITORING SYSTEM**

The vessel shall be equipped with a monitoring and alarm system to monitor and provide alarm function of the vessel's equipment. The main station shall be fitted in the pilothouse, with a second station at crew's lounge.

The monitoring and alarm system shall:

- be powered by the main electrical supply with automatic back-up through the emergency system;
- include programmed mimic screens, each displaying a specific portion of the alarm/monitoring groups;
- be fitted with sufficient Data Acquisition Units, each with at least two unused incoming channels kept free for any retrofitting, to be located throughout the yacht in such a way as to remain accessible, while requiring the shortest possible cable runs;

It shall be the intention that all alarms of all systems shall be incorporated, as far as necessary. To achieve this, the Builder shall wherever possible order all systems and equipment items in such a way that monitoring and alarm functions of the systems and components from different manufacturers are compatible. The following screens shall be displayed in the system:

- Tank levels and high level alarms
- Bilge system
- Battery chargers
- Watertight and weather tight doors
- Fire dampers
- Water jet system
- Navigation Lights
- Generator Management System

## **4160 GENERAL ALARM SYSTEM**

A General Alarm System shall be provided in compliance with MCA, for Short Range.

The system shall be integrated in the fire detection system; alarm sirens will sound with a different tone (generally one long signal and seven short). Two push buttons shall be provided in pilothouse (1) and crew lounge (1).

## **4165 FIRE AND GAS ALARM SYSTEM**

A fire alarm system fully in accordance with the Class and MCA requirements shall be installed. The system shall incorporate:

- Optical smoke detectors in all accommodation and technical spaces.
- Manual call points at strategic locations
- Heat detectors in galley, engine room and laundry.
- Audible alarm electronic siren in accommodation spaces
- Audible alarm electronic siren in engine room, with flash light
- Fire Alarm Panel in wheelhouse, of analogue addressable type.

A gas alarm system shall be provided with petrol vapour sensor in the jet-ski area and alarm/indication panel in the pilothouse .

Fire and gas alarm indication shall be displayed in the Ship Monitoring and Alarm system.

## **4170 ENGINE CONTROLS**

The vessel shall be outfitted with one fixed engine control station located in the pilothouse and flying bridge as well as via a portable control to reach the ship side during the manoeuvring.

## 42 ELECTRONICS / ENTERTAINMENT

All the products listed in this section are currently available; the Builder reserves to modify it according to new products or technological evolutions, maintaining at least the same functions and features.

### 4205 NETWORK-TELEPHONE SYSTEM

#### System description

The on-board network system shall be designed to have one or more Local Area Network RJ45 Ethernet plugs in every cabin, to connect them with computers with Ethernet card to access the Internet or, for authorized users, to remote access headquarter, when VPN remote access is allowed.

Moreover there shall be a wireless 802.11x standard 11Mbps coverage according ETSI European standard in common spaces and in owner cabin, allowing to access the local area network by means of laptop computer with PCMCIA 802.11 radio card.

The wireless LAN relies on Linksys access points, then the kind of coverage (802.11x) will be according the Linksys release available at the time of the delivery of the products.

Regarding the connections from the yacht to the rest of world the system can have:

- GSM and GPRS tri-band (900MHz and 1800 MHz for Europe or other countries and 1900MHz for US) mobile telephone network telephony connection to phone calls near the coast, allowing savings on expensive satellite phone calls
- Shore lines telephone connections
- WiFi Bridge for port WiFi connection (just predisposition).
- Predisposition for 3G (UMTS) System (antenna and data terminal not included)

#### 4205.1 In wall Ethernet plugs and wi-fi access points.

Zone	Plugs	Access Point
Wheelhouse	2	-
Engine Room	1	-
Garage	1	-
Guest1	1	1
Guest2	1	-
Vip1		1
Vip2	1	-
Crew Mess	1	1
Main Salon	1	1
Master Cabin	2	1

## 4205.2 Internet connections management software

A specific software utility allows the Captain or users by means of laptop, via Internet Explorer, to choose, to start and to end the Internet connections.

The application, which has been developed since several years and installed in a number of motor yachts, is on top of Microsoft ISA Server application, which acts even as default gateway and firewall.

In this system release the users authorization and the users amount of traffic log is not included.

No email server is installed on board.

Connection	Activation	Settings	Status
Shore_Line	<a href="#">Activate</a>	<a href="#">Modify</a>	NOT CONNECTED
GPRS - GSM	<input checked="" type="checkbox"/> <a href="#">Activate</a>	<a href="#">Modify</a>	READY FOR CONNECTION
VSat Connection (FLAT)	<a href="#">Activate</a>	No Allowed Modification	NOT CONNECTED

[Start Connection](#)      [Stop Connection](#)

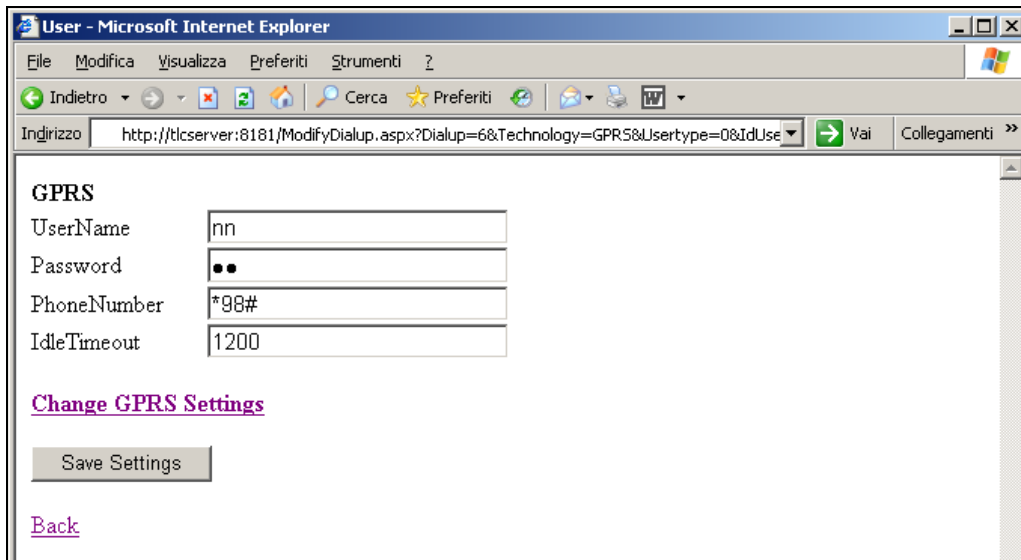
**Disable All**

<a href="#">Add New GUEST Internet User</a>	<a href="#">Add New YACHT Internet Users</a>
<a href="#">Show Internet Users</a>	
<a href="#">Traffic Counter</a>	<a href="#">Daily Traffic Counter</a>
<a href="#">Site User Manager</a>	
<a href="#">Configuration Manager</a>	

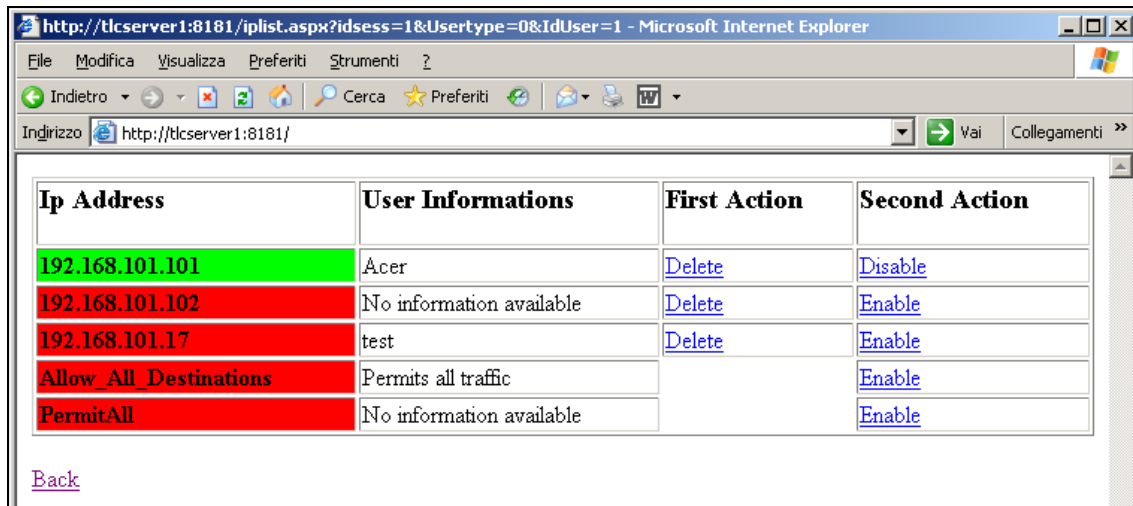
[Logout](#)

Intranet locale

**GPRS activation**



**"Modify Parameters Manually" link in case of GPRS Connection**



**"Show Internet Users" link**

### 4205.3 Telephones

For the telephone system the digital Panasonic TDA30 PBX rack mounted, wired digital telephones and cordless telephones shall be installed, in order to have world class assistance as well as excellent compatibility.

The cordless phone cannot roam, but have to stay radio connected to their own base. They don't have digital PBX functions.

#### Fixed digital telephones

*1 x Crew Mess (wall mount)*

*1 x Engine Room*

#### Master Telephone

*1 x Wheel house*

#### Cordless telephone

*2 x Guests*

*2 x VIP*

*1 x Salon*

*1 x Owner's Cabin*

*2 x Crew Cabin*

*1 x Captain Cabin*

*1 x Sparefor Main deck aft*

### Bang & Olufsen 1401 BCA

1 x Dashboard

### 4205.4 In wall Telephone plugs.

<b>Zone</b>	<b>Plugs</b>
Wheelhouse	2
Engine Room	1
Garage	1
Guest1	1
Guest2	1
Vip1	1
Vip2	1
Crew Mess	1
Main Salon	1
Master Cabin	1



## 4205.5 System units

Art.	Q.ty	Description
1	1	CISCO Linksys 48 ports Ethernet rackmounted switch
2	1	IBM or HP Computer Server, 1RU, 1024 MBRAM, 2x100GB HDD SATA RAID1, Windows 2003 Server, Microsoft ISA Server, serial Multiport 4 ports, 3 Ethernet Ports
3	1	Software for WAN connection management (light version)
4	1	HP Last Generation Laptop
5	1	Predisposition for 3G (UMTS) Antenna
6	1	Predisposition for Wifi Bridge System
7	5	CISCO Linksys Access Point WEP 128 cryptation
8	1	Ericsson 2412 GSM/GPRS terminal and external antenna
9	1	HP 7410 Office Jet colour, printer, copier, scanner and fax for wheelhouse
10	1	PANASONIC PBX TDA30, power supply, rackmounting kit
11	1	PANASONIC 8 pstn incoming lines, 8 digital+ 8BCA extensions
12	1	Doorbell adapter with RF control for PBX
13	1	PANASONIC KX-T7663 3 lines master telephone with display in wheelhouse
14	2	PANASONIC KX-T7665 telephone with display in Crew Mess and in Garage
15	11	PANASONIC KX-TCA255 cordless DECT telephone with vivavoice (2xGuests, 2xVIPs, 1xSalon, 1xOwner's Cabin, 1xCaptain's Cabin, 1 spare x Sun Deck, 1 spare x E.M.Deck, 2 x Crew Cabins)
16	1	Bang & Olufsen BEOCOM1401 fixed analogue phone for Dashboard
17	1	CAT5 cabling system and patch panel

### Services

Art.	Q.ty	Description
1	1	Engineering, design, technical presale-support, after sale assistance
2	1	Network configuration, startup and crew training
3	1	Telephone configuration, startup and crew training
4	1	Executive design of the cabling system and technical assistance to electricians during cables deployment
5	1	Cabling system connections

## **4210 COMMUNICATION SYSTEM**

The communication system shall include:

### **4210.1 VHF SYSTEM**

No 1 RADIOTELEPHONE VHF SKANTI TRP1000 ( A class ): duplex, output power 25/1W , DSC function, in accordance GMDSS regulation

24 VDC Power supply

220/24 Power supply

No 2 WIP Antennas

No 1 Additional remote control for VHF console

No 1 Additional remote control for VHF in crew mess

No 1 Additional remote control for VHF in fly bridge

### **4210.3 SAT. COM. SYSTEM**

No 1 SAT COM INMARSAT C SAILOR TT3020C in accordance to GMDSS regulation:

10/32 VDC , complete of 220/24 power supply

No 1 Sailor battery charger

No 1 Sailor battery panel

No 1 SAT COM INMARSAT F77 T&T SAILOR

### **4210.4 SAFETY SYSTEM**

#### EPIRB

No 1 Epirb Mc Murdo

#### RADAR REFLECTOR

No 1 Radar transponder Mc Murdo

#### METEO RECEIVER SYSTEM

No 1 NAVTEX FURUNO NX 700 Receiver , GMDSS compliance , for 10/40 Vcc,

Comprising of:

Recorder/receiver

Standard spare parts and installation materials

NX 7 antenna amplified

#### PORTABLE RTX VHF SYSTEM

No 2 GMDSS Portable VHF

No 6 PORTABLE VHF ICOM IC-M87 with standard single battery charger

No 1 Battery charger 6 unit

No 6 Belt clips

No 6 Handset with microphone

### AIS

No 1 AIS SYSTEM TRANSAS MT 2 to be integrated on Navigation System

### SSAS SYSTEM

No 1 Transas to be integrated on Navigation System.

(The two buttons will be located one in wheel house and one in crew mess)

## **4215 NAVIGATION EQUIPMENT**

The navigation equipment shall include:

### **4215.1 RADAR SYSTEM**

Integrated system for No 1 radar ( X band) , echo sounder system

No 1 RADAR FURUNO NN Mod. FR 1954 Black Box X band, 12 Kw , for 24 VDC,

4 ft antenna

Installations materials

30 mt antenna cable

standard spare parts

No 1 Monitor 17 “ Hatteland or equivalent

No 2 Monitor 12 “ for fly bridge

No 1 Track ball IP 65

No 1 ARPA Interface

No 1 GYRO Interface

### **4215.2 ECHOSOUNDER SYSTEM**

No 1 NETWORK SOUNDER ETR-6/10N per 12-24 VDC

Black Box ,dual frequency 50/200KHz

Bronze Transducer 50/200 KHz

### 4215.3 RX GPS SYSTEM

No 1 SATNAV GPS FURUNO Mod. GP 37, DGPS/WAAS built-in ,  
12 parallel channel GPS receiver, waterproof display,  
Nav data display in graphics and alphanumeric mode  
Up to 999 waypoints in memory,  
50 routes with up to 30 waypoints each, 10/31 VDC consisting of :

4,5" monochrome LCD

Antenna unit GPS / DGPS with antenna cable

Standard spare parts and installation materials

No 1 SATNAV GPS FURUNO Black Box Mod. GP 320

### 4215.4 CARTOGRAPHY SYSTEM

No 1 CARTOGRAPHY SYSTEM consisting of:

No 1 Processor Unit

No 1 Keyboard/Mouse Cordless

No 1 Track ball Kensington

No 1 Display LCD 19" marine version IP65 Hatteland or equivalent

No 1 Software Transas ECDIS 3000

No 1 TRANSAS MEDITERRANIAN CHART

**No 1 Conning Position System consisting of:**

No 1 Processor Unit

No 1 Keyboard/Mouse Cordless

No 1 Display LCD 17" marine version IP65 Hatteland or equivalent ( Location  
WheelHouse )

No 1 Software TI AD-NMEA01 BASIC for simultaneous view of the following data ( only  
for the sensor listed):

- Heading
- Rate of turn
- Boat speed
- Speed over ground
- Depth
- Water temperature
- Wind speed
- Wind direction
- GPS

- Air temperature
- Air pressure

No 1 Video matrix System for 8 monitor e 8 video source (CCTV – Conning – RADAR- Eco)  
 No 1 Converter per TVCC

#### **4215.5 LOG & WIND SYSTEM**

No 1 WIND / DEPTH / LOG SYSTEM B&G H 2000

Comprising of :

- processor unit
- Head mast unit
- No 1 bronze speed boat sensor with SOV valve
- No 1 bronze echo-sounder sensor with SOV valve
- No 1 Air temperature sensor
- No 1 Air pressure sensor
- No 1 DISPLAY full function FFD (Radio room)
- No 1 DISPLAY full function FFD for Captain Cabin

#### **4215.6 NMEA SYSTEM**

- No 1 GT NMEA Interface for NMEA signal distribution
- No 1 BLUETOOTH System for NMEA data position

#### **4215.8 AUTOPILOT SYSTEM**

No 1 AUTO PILOT C.Plath Mod Navipilot HSC/GM  
 microprocessor , digital ,  
 console version, 24 Vcc ( 18-36 Vcc ) power supply to connect a gyrocompass and  
 magnetic compass

C.Plath and a solenoid valve rudder comprising of:

No 1 command unit and LCD display with analogical selection of:

- \* correction rudder
  - \* sensibility
  - \* rudder
  - \* clash rudder
  - \* out course independent rudder
  - \* magnetic declination
- Continuously indication of :
- \* Steering mode
  - \* follow course

- \* plan course
  - \* rudder angle
  - \* correction rudder
  - NMEA interface to steering between position receiver
  - RS 422 serial output
- Kamewa System

No 1 C PLATH Frame for console installation

#### **4215.9 MAGNETIC COMPASS SYSTEM**

No 1 MAGNETIC COMPASS VENUS 120 mm

Console installation

#### **4215.10 GYROCOMPASS SYSTEM**

No 1 C.PLATH Gyrocompass system NAVIGAT X MK2, stand version, for connection to 24 VDC (18-40 VDC) with following outputs:

- \* analogue repeaters RS 422 self-aligning type
- \* analogue repeater, 6 steps/degr.
- \* electronic outputs 6 steps/degr., for connection to RADAR, SATCOM, GPS, etc.
- \* NMEA output      Plath format, or NMEA 0183,
- \* RS422 output      or LR 40 format
- \* (+2) rate of turn output, selectable 30. 90 or 300 degr./min. (max. +/-9VDC)

with power failure and system alarm, selectable follow-up speed 25 degr./sec. Or 10 degr./sec., comprising :

- \* Master-compass NAVIGAT X, with built-in double card system (360/10 degrees), failure alarm red illumination with dimmer and 3 m. cable and plug
- \* Gyro container in transport box
- \* Gyrosphere in transport box
- \* Electronic power and control unit
- \* Distribution terminal board with sockets
- \* Spare parts kit
- \* Manuals in English

Emergency Steering Room

No 1 Cable for Universal Didigital repeater for gyrocompass

## **4220 ENTERTAINMENT EQUIPMENT**

### **4220.1 Introduction**

The main intent of the entertainment system design is to include an integrated system, based on a cabling and network framework with as much commonality as possible, to be able to provide a full range of services:

- digital entertainment with high level displays, amplifiers and speakers
- full internet connectivity
- worldwide coverage for telephony and fax
- high level security and CCTV system
- Home automation services (lights control, curtains control, HVAC control)

Integration means:

- unified user interfaces
- TCP/IP units
- modularity in tailoring custom based systems

ISA Yard invests about 10% of its annual turnover in new yachts systems development and relies on close partnerships with international class Universities and Research Centres and in direct supply and technological partnerships with world class suppliers like Cisco, Microsoft, Hitachi, AMX, Lutron, Panasonic and Seatel.

Practical results and outputs from this leading project, regarding home-automation and communications are continuously transferred into the series constructions, allowing ISA to boast an actual best class offering for on-board electronics systems.

Although all efforts are done to install a top quality system and during installation training services to crew are included, ISA yard supports the customer after the yacht delivery with its service department, coordinating the systems suppliers.

According last improvement in high speed satellite communications, a lot of initial trouble shooting can be done via remote assistance.

The general design rules are:

- using last-generation devices to have the best protection of investment
- using world leader brands devices to have an effective world-wide assistance

## 4220.2 Main system function

The system for MY ISA 120.00 has been designed and tailored on the customer needs for the main goals:

- having DVD Players in Main Salon, Master Cabin, Guest's Cabin (nr.2), VIP's Cabin (nr.2), Crew Mess
- having SAT/TV Radio and FM Radio
- having Dolby Digital Surround and DTS in Main Salon and Master Cabin
- having a 30" SAT TV Dish
- Mini – M F77 and shore line connection will be the only way to send and receive a fax.
- monitoring by PTZ and FIXED night and day cameras
- high quality sound and power in all the external areas (sun deck, main deck aft)
- in the wheelhouse is possible to receive SAT TV + AMX MAX Audio signals and the control is performed via Onyx Main TP
- all DVDs has to be multi region
- having in all cabins i-Pod Plugs
- having a Tree Standard TV Terrestrial Tuner installed into Main Rack

## 4220.3 Satellite TV Antenna

This system relies on:

Seatel 3004 30" dish self-point auto stabilizing antenna and DAC2000 control unit, with TSC-10 touch screen controller in order to exploit the video preview function of the touch screen.



For the antenna there is in the supply main LNB device for European and International satellites.

The LNB's have to be changed manually according the continent.

The US DSB and the DirecTV Latin America LNB's are not included in the supply.

Further infos for footprints, coverage data and satellite channels at web sites:

[www.satcodx.com](http://www.satcodx.com)

[www.lyngsat.com](http://www.lyngsat.com)



#### 4220.4 Satellite Receiver and related control

In the scope of the supply are included n.8 DVB receivers with double common interface slot.

These receivers are able to receive:

- free to air DVB channels
- pay per view DVB channels, whose provider allows to see via Conditional Access Module

In the supply are included n.8 CAM's.

At the moment management proposal is the following.

- Sat 1 RX for owner cabin.
- Sat 2 RX for main salon.
- Sat 3 RX for VIP cabin 1
- .Sat 4 RX for VIP cabin 2
- Sat 5 RX for Guest Cabin 1.
- Sat 6 RX for Guest Cabin 2.
- Sat 7 RX for Crew Mess.
- Sat 8 RX for Wheelhouse. The port Hatteland screen will be connected. The control will be performed by the TP's for wheelhouse automation

#### 4220.5 Remote controls system

The system includes the following devices for the remote control of the entertainment system and auxiliary devices (as described further in the present document):

AMX Wireless Wi-Fi colour 7.5" LCD touch panels located an the following areas:

- Main Salon + Modero Wall/Flush Mount (black color)
- Owner's suite + Modero Wall/Flush Mount (black color);



HP PDA iPaq HX-4700 located in the following areas:

- Crew Mess;
- 2 x Guests;
- 2 x VIPs;



Note: in wheelhouse the control is with Wheelhouse TP's;

#### 4220.6 AMX Video and Audio on Demand System

The AMX MAX MMS-04S multimedia server will be installed in the main rack and allows to store up to more than 2500 compressed audio CD's or 100 video DVD's and offer independent access to the different areas.

MAX combines the worlds of music, movies and personal multimedia content.

MAX is at the moment the only integrated content server on the market with the ability to store, manage, instantly locate and play audio, video and personal multimedia content.

It offers many new features

**Cover Art** – Search for CD/DVD titles by navigating actual cover/poster art on the touch panel. Make your selections or access title information by simply touching the cover/poster.

**Quick Search** – Search for content in MAX by artist name, genre, song or movie title, director, actor and the list goes on. No more CD and DVD cases, and forget about remembering slot numbers on your CD/DVD players. MAX keeps your content readily available and quickly accessible.

**Custom Playlists** – Create custom playlists for all your content. Select the type and amount of content from the stored content library. Also, bookmark your favorite CD/DVD tracks or chapters and play content on a track-by-track or scene-by-scene basis.

**On-Demand Video** – Experience the added convenience of MAX's auto-repeat video function and the ability to bookmark video scenes. Watch exactly what you desire, quickly and effortlessly.

**Simultaneous Playback** – MAX provides the ultimate flexibility in multi-room viewing/listening. Listen to your favorite jazz tracks on the owner cabin while a movie plays simultaneously in the main salon.

**Native Format** – MAX captures and preserves the depth, dynamics and sharpness of the original recording, also known as native CD and DVD quality. Have an existing MP3 collection? No problem. MAX is capable of storing and playing this “compressed” audio file format.



In each cabin the contents can be accessed in fully on-demand way, with on-screen display.

To keep the installation clean, the players of the cabins are installed in main racks, except the ones for Owner cabin and main salon which are installed locally.

### **AMX AVM**

- 1 x Main Salon salon (installed into Local Area)
- 1 x Owner's Cabin (installed into Local Area)
- 2 x VIP cabin (installed into Main Rack)
- 2 x Guest cabin (installed into Main Rack)
- 1 x Crew Mess (installed into Main Rack)

### **AMX AOM (n°1 module with n°4 independent output)**

- 1 x Sun Deck (installed into Main Rack)
- 1 x External Main Deck (installed into Main Rack)
- 1 x Wheelhouse (installed into Main Rack)
- 1 x Predisposition (installed into Main Rack)

#### 4220.7 Tuner TV Terrestrial Multistandard

In the Main Rack is installed the Samsung SV-5000W how TV Tuner Terrestrial multistandard and is cabling in matrix for send signal audio video in all cabins.



**TV System Input/Output:** NTSC 3.58, NTSC 4.43, PAL, PAL-N, PAL-M, SECAM, MESECAM.

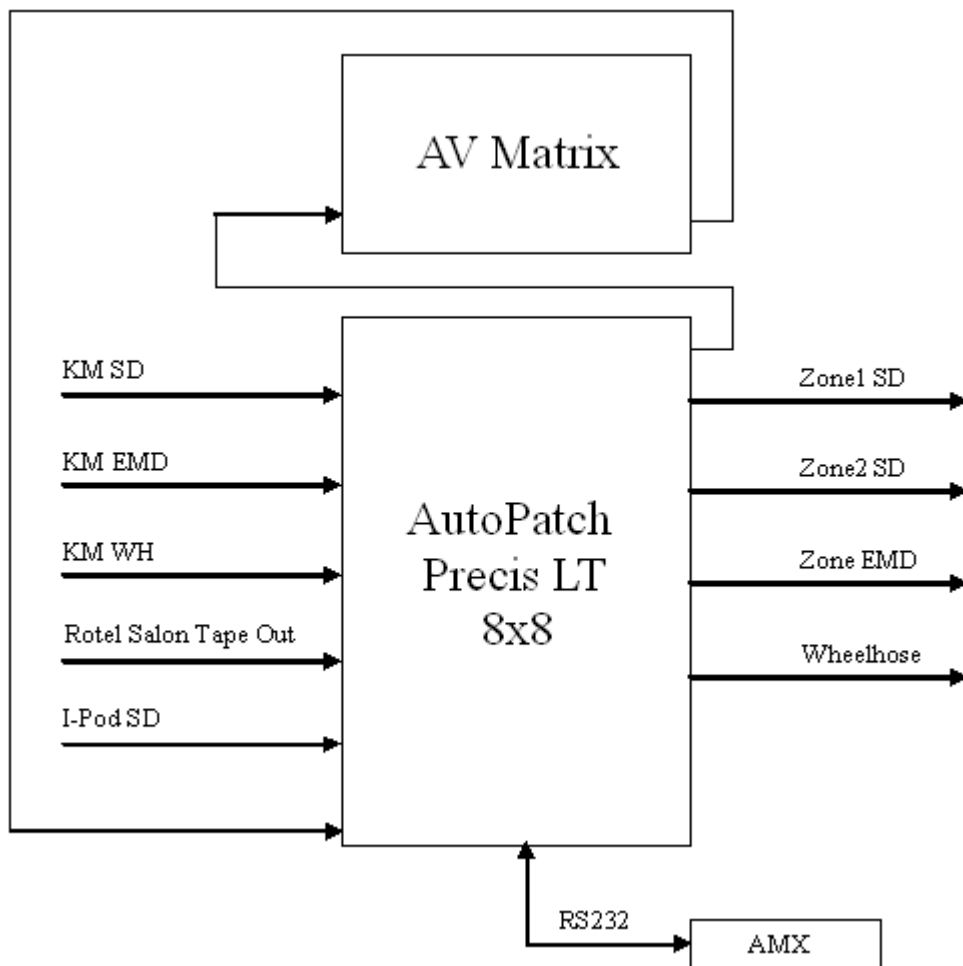
#### 4220.8 Audio and video distribution

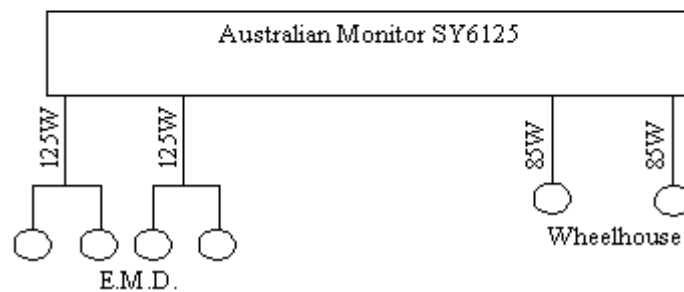
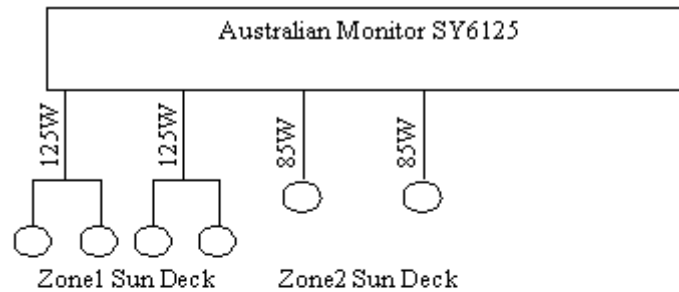
n.	Input	Output
1	DVB Main Salon	Main Salon
2	DVB Owner Cabin	Owner Cabin
3	DVB VIP1	VIP1
4	DVB VIP2	VIP2
5	DVB Guest1	Guest1
6	DVB Guest2	Guest2
7	DVB Crew Mess	Crew Mess
8	DVB Wheelhouse	Wheelhouse
9	AMX AVM VIP1	to AutoPatch
10	AMX AVM VIP2	<b>Predisposition</b>
11	AMX AVM Guest1	<b>Predisposition</b>
12	AMX AVM Guest2	<b>Predisposition</b>
13	AMX AVM Crew Mess	<b>Predisposition</b>
14	Samsung SV-5000W Tuner TV	<b>Predisposition</b>
15	from AutoPatch	<b>Predisposition</b>
16	<b>Predisposition</b>	<b>Predisposition</b>

In main salon touch panel, the party mode (i.e. same audio in external zones and main salon) can be managed.

### 4220.9 Audio External

The external configuration for audio system is explain below:





#### 4220.10 Crew Mess Monitor

Crew mess have two monitor:

- 1 x CCTV System
- 1 x AV System

#### 4220.11 i-Pod Plugs

In all cabins we have the i-Pod Plugs internal to the local rack for link audio/video device to the local amplifier.

We have the i-Pod Plugs also in Sun Deck and in Main Rack.

## 4220.12 Entertainment System

### Radio FM antenna system

Art.	Q.ty	Description
1	1	NAVAL VPA30 AM/FM Antenna
2	1	NAVAL PSA30W-3 AM/FM Antenna Amplifier
3	1	Amplifier, RF cable and RF splitters

### Entertainment main racks

Art.	Q.ty	Description
1	1	SEATEL 3004E 30 inch autopositioning and auto stabilizing TV antenna with DAC2200 rackmounted unit; only European LNB + SEATEL Radome Empty for 3004E series + SEATEL TSC-10 touch panel with video input for preview
2	8	DVB satellite receiver double common interface and CAM module
3	1	Linksys Ethernet Switch 16 ports 10/100/1000 for AMX-MAX System
4	1	AMX Video On Demand mod. MAX MMS 04S
5	5	AMX Audio Video Module mod. AVM (2xVIP, 2xGuest, 1 x Crew Mess)
6	1	AMX Audio Video Module mod. AOM (for Sun Deck, External Main Deck, Wheelhouse)
7	1	EXTRON MAV1616AV 16x16 A/V switcher
8	1	AutoPatch Matrice Audio Stereo con DSP mod. PRECIS LT 8x8 (per gestione Audio SD, External MD and Wheelhouse)
9	2	Australian Monitor Amplifiers 6 x 85W 8 ohm - 6 x 125W 4 ohm mod. SY6125 (1 for Sun Deck, 1 for Ext. Main Deck and Wheelhouse)
10	1	Samsung VCR Multistandard mod. SV-5000W (for tuner TV Terrestrial)
11	1	AMX NI-4000 CPU
12	1	External audio (IPOD) plug
13	3	Custom 24" RU installation rack
14	1	Cloride Silectron UPS mod. Power Rack Plus 3 KVA

### Wheelhouse

Art.	Q.ty	Description
1	0	Wheelhouse TP's
2	2	B&W CCM65 speaker

### Sun Deck

Art.	Q.ty	Description
1	6	Sonance XTR
2	1	Xantech WPK8 8 buttons water proof keypad

3	1	AMX AXD-IR+ (hidden)
4	1	Xantech Connecting Block mod. 789-44 with power supply
5	1	External audio (IPOD) plug

#### External Main Deck

Art.	Q.ty	Description
1	4	Sonance XTR
2	1	Xantech WPK8 8 buttons water proof keypad
3	1	AMX AXD-IR+ (hidden)
4	1	Xantech Connecting Block mod. 789-44 with power supply

#### Main Salon

Art.	Q.ty	Description
1	1	Panasonic 42" Plasma TV mod. TH-42PV60E (lift TV is supplied by ISA)
2	1	Rotel Sinto-Amplifier mod. RSX-1067
3	1	Rotel DVD Player mod. RDV-1060
4	1	AMX Audio Video Module mod. AVM
5	4	B&W in ceiling speaker mod. CCM65
6	1	B&W active subwoofer mod. AS1
7	1	AMX Wi-Fi 7.5" Touchscreen mod. MVP-7500
8	1	AMX wall mounted motorized docking station mod. MVP-WDS
9	1	External audio (IPOD) plug
10	1	Apart Amplifier mod. SBR-160 for Dining
11	2	B&W in ceiling speaker mod. CCM65 for Dining
12	0	Keypad for Volume control by ISA (no videoworks furniture)
13	1	Rack Local A/V

#### Master Cabin and Bathroom

Art.	Q.ty	Description
1	1	Panasonic 42" Plasma TV mod. TH-42PV500E with Wall Bracket
2	1	Rotel Sinto-Amplifier mod. RSX-1056
3	1	Rotel DVD Player mod. RDV-1060
4	1	AMX Audio Video Module mod. AVM
5	5	B&W in ceiling speaker mod. CCM65
6	1	B&W active subwoofer mod. AS1
7	1	AMX Wi-Fi 7.5" Touchscreen mod. MVP-7500
8	1	AMX wall mounted motorized docking station mod. MVP-WDS
9	1	External audio (IPOD) plug
13	1	Raymar Amplifier mod. CPA-50 for Bathroom
14	1	Sonance Single Stereo Speaker mod. CR101SST for Bathroom
15	0	Keypad for Volume control by ISA (no videoworks furniture)
16	1	Rack Local A/V

#### Guest Cabins (nr.2)

Art.	Q.ty	Description
1	2	Samsung 23" LCD mod. LE-23R51



2	2	Denon Sinto-Amplifier-DVD Player mod. DHT-500
3	4	B&W in ceiling speaker mod. CCM65
4	2	AMX IR Expander mod. AXB-IRS4
5	2	HP PDA iPaq mod. HX-4700
6	2	External audio (IPOD) plug

#### VIP Cabins (nr.2)

Art.	Q.ty	Description
1	2	Samsung 23" LCD mod. LE-23R51
2	2	Denon Sinto-Amplifier-DVD Player mod. DHT-500
3	4	B&W in ceiling speaker mod. CCM65
4	2	AMX IR Expander mod. AXB-IRS4
5	2	HP PDA iPaq mod. HX-4700
6	2	External audio (IPOD) plug

#### Crew Mess

Art.	Q.ty	Description
1	1	Samsung 23" LCD mod. LE-23R51
2	1	Denon Sinto-Amplifier-DVD Player mod. DHT-500
3	2	B&W in ceiling speaker mod. CCM65
4	1	AMX IR Expander mod. AXB-IRS4
5	1	HP PDA iPaq mod. HX-4700
4	1	External audio (IPOD) plug

#### Captain's Cabin

Art.	Q.ty	Description
1	1	Sony Car Stereo mod. CDX-500
2	1	Sonance Single Stereo Speaker mod. CR101SST
3	1	External audio (IPOD) plug

#### Crew Cabins (nr.2)

Art.	Q.ty	Description
1	2	Sony Car Stereo mod. CDX-500
2	2	Sonance Single Stereo Speaker mod. CR101SST
3	2	External audio (IPOD) plug

#### Connectors and Cables

Art.	Q.ty	Description
1	1	C134 high quality video cable (CVBS e S-Video)
2	1	High quality audio cable
3	1	Shielded cable for AMX and serial connections
4	1	High quality audio-video connectors and accessories

#### Software Development

Art.	Q.ty	Description
1	1	AMX software development (including written specs, development, start-up, training and user manuals)

#### Other Services

Art.	Q.ty	Description
1	1	Engineering, design, technical presale-support, after sale assistance
2	1	Executive design and schemes, Technical assistance to electricians during the cables deployment
3	1	Manuals

4	1	Devices mounting
5	1	System startup
6	1	Crew training (3 days)

## 4225 CCTV SYSTEM

For reason of quality and maintenance the CCTV system is based on world leader Panasonic products.

The installation will include the following:

- No.1 PTZ dome external camera on the Main Deck Aft.
- No.1 PTZ dome external camera on Mast.
- No.2 FIXED cameras in Engine Room.

The cameras are night and day, passing to black and white format in low light condition.

The controls is in wheelhouse:

- Main Joystick.
- Onyx Main TP.

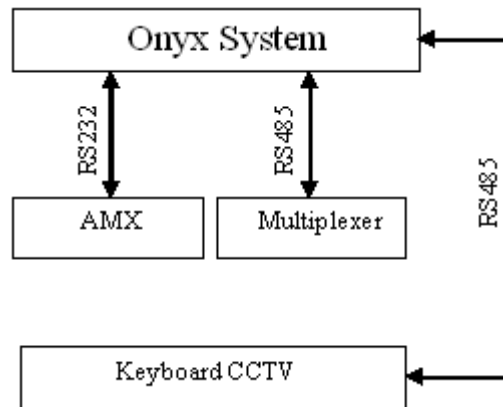
From Crew Mess only quad or cycle view.

Note: The Crew Mess has a plug to link the Joystick and a plug for 9V.

### 4225.1 System Unit

Art.	Q.ty	Description
1	2	Panasonic WV-CW960AG PTZ water proof outdoor day night dome camera (for Mast, Main Deck Aft)
2	2	Panasonic WV-CW470AS/G water proof outdoor day night dome camera (2 x Engine Room)
3	1	Panasonic WV-CU360 control keyboard. For camera control in wheelhouse
4	1	Panasonic WJ-HD309/G Hard disk recorder
5	1	Extron Scan Converter mod. VSC-500 (for to send the output 1 of multiplexer to Hatteland monitor)
6	1	Panasonic 17" TFT Monitor mod. Neovo SX-17A (in Crew Mess)
7	1	Engineering, design, technical presale-support, after sale assistance
8	1	Executive design, technical assistance, system startup and crew training

## 4225.2 Interface with Onyx System



## 4230 INSTALLATION AND MAIN RACKS

### 4230.1 Main Racks

These are custom made pullout frame-only zinc-coated black-painted steel professional racks. We have 3 Main Rack with the following specifications:

### 4230.2 24 RU's

- pull-out rack with two couples professional pulling out guides rubber wheels in the bottom plate
- Height: 1200 mm (wheels space incl.)
- Width: 600 mm
- Depth: 650 mm
- Height from floor for wheels positioning: 80-100 mm

### 4230.3 Cabins

Because of the few devices (one amplifier and one AMX box) the devices in the cabins will be built in; the Builder will assure adequate ventilation for them.

## 4240 UPS SYSTEM

The Builder will supply one 3000VA UPS to be installed in the main racks.

#### **4250 EXTRA EQUIPMENT**

If the Owner will require further equipment to be fitted on board, the Builder will submit a quotation for such extra request as totally as only the place on board where the Owner will personally supply the equipment; in last case the Owner will advise for type, size and necessary cabling.

## 43 SHIP AUXILIARY

### 4305 CLASSIFICATION AND CERTIFICATION

The yacht shall be built under the survey of and in full accordance with the R.I.N.A Rules for construction and classification of Pleasure Vessels (1996) including additional rules applicable to pleasure vessels for the assignment of the MCA Short Range Yacht compliance certificate and all amendments and notices issued up to the date of signing the Vessel Construction Agreement. The class notation shall be R.I.N.A:

**C, ✕HULL,\* MACH,Y<sub>CH</sub> (MCA),Short Range**

The Builder shall maintain copies of all materials and equipment certificates from manufacturer's and suppliers required by R.I.N.A.

Other laws, rules and regulations, applicable as guidelines to the construction, including all amendments, valid at the date of signing the Vessel Construction Agreement:

- R.I.N.A., Rules and Regulation for Charter Yachts, 2005.
- The MCA-Code of Practice for large commercially operated sailing and motor yachts – LY2 Short Range Yachts
- The 1966 International Convention on Load Lines
- International Convention for the prevention of Collision at Sea, 1972 and amendments
- GMDSS requirements in accordance with MCA
- UK Flag Registry Regulations.
- 

All necessary certificates and documents for the proper and unencumbered operation of the yacht shall be obtained by the Builder and supplied to the Owner at the time of delivery of the yacht and shall include:

- 1) Classification Certificate issued by RINA or interim Certificate.
- 2) International Load Line Certificate issued by RINA
- 3) Record of Inspection for Charter Yacht over 24 m issued by MCA
- 4) Certificate of Compliance for a Large Commercial Yacht issued by MCA
- 5) Builder's Certificate issued by the Builder.
- 6) International Tonnage Certificate issued by RINA on behalf of the registered Flag.
- 7) Navigation lights Certificate.
- 8) Magnetic compass Certificate.
- 9) Compass adjustment Report.

## **4310 TRIALS AND TESTS**

All tests and trials shall be conducted in accordance with the requirements of the Classification Society requirements and Builder's practices.

The Builder shall conduct tests and trials necessary to ensure that all structure, systems, equipment and fittings are in accordance with the specification and working satisfactorily. The yacht's machinery, equipment and fittings to undergo shop testing according to the Builder and/or manufacturer's usual practices followed by such onboard test as considered necessary.

Further, in testing equipment, particular attention shall be paid to vibration, seating, leaks and practical operating convenience.

Prior to start the testing phase, the Builder shall submit to the Owner's Supervisor in due time the detailed schedule or memorandum for the official tests of equipment and machinery.

The Owner's Supervisor and the Builder shall, on the basis of the above mentioned detailed schedule, determine the scope of tests or inspections to be attended by the Owner's Supervisor.

Dock trials and preliminary underway trials shall be carried out in accordance with the Builder's practice and at his discretion.

All mechanical, propulsion, piping, refrigeration and electrical systems shall undergo satisfactory dock trials and shall operate at various loads for a sufficient length of time to demonstrate to be in proper working order before sea trials.

The Owner's Supervisor may be in attendance if he requests.

When the yacht is substantially completed, except for such items of work as the Builder considers can be accomplished at a later date and not part of the sea trial, the yacht shall be subject to the acceptance sea trials described below.

The official sea trials shall be carried out in accordance with the sea trial schedule submitted by the Builder to the Owner.

The Builder is responsible for collecting and analysing all data and records obtained during the various trials, properly tabulated and presented into a trials record booklet, one copy to be supplied to the Owner.

The sea trials shall be carried out by and at the expense of the Builder who shall provide all necessary material and services for the operation of the yacht during the sea trials programme.

The following trials shall be run in accordance with Classification requirements:

### **4310.1 Progressive Speed Trial**

The official sea trials shall be conducted under sea conditions as indicated at section 0025.6. In case of unfavourable conditions, the date of sea trials shall be postponed.

The vessel shall be set in sea trial trim under Builder responsibility.

The yacht's speed shall be measured by a dedicated GPS or such method as may be suitable and agreed at the time. Two runs shall be conducted at each speed point for at least 1 nautical mile, and at 180° one to the other.

The wind direction and speed shall be recorded together with a good indication of sea state.

Sea trials shall be carried out at least at 25%, 50%, 75%, 100% of the engine power to cover the expected speed for range calculation; a representative of the engines manufacturer shall note engine exhaust gas temperatures together with the exhaust back pressure. At each run, the shaft

power and engine rpm shall be recorded and reported. Shaft power shall be determined by use of an electronic torque meter.

Measurements shall be also taken of fuel intake air pressure, air temperature, etc.

For the purpose of range calculation, engine fuel consumption shall be determined by the MTU monitoring system. The engine test bed results shall determine the acceptability of this method.

#### **4310.2 Manoeuvring Trials**

The yacht shall be subjected to manoeuvring trials which will include ahead and astern steering at maximum and minimum speeds, turning circles to port and starboard, maximum speed "Z" manoeuvring.

Ahead and astern steering and turning circle manoeuvres shall be carried out with the automatic pilot.

#### **4310.4 Equipment Trials**

All mechanical, electric and electronic equipment and systems shall be tested and shown to be in a satisfactory working order while operated under yacht generated electrical power.

All pumps shall be operated sufficiently to demonstrate a satisfactory installation together with their associated systems components.

The dockside trials shall also include hose tests on hatches, doorway, windows, portholes and joint line. The required water tightness shall be demonstrated.

Effective performance of anchoring equipment shall be demonstrated by setting and recovery of the gear in the open deep sea.

#### **4310.5 Noise**

Noise measurement shall be taken during sea trials in all compartments as specified at section 0055.

## **44 TECHNICAL AREAS**

### **4405 MACHINERY SPACE**

The machinery space shall be easily accessible through convenient steel insulated door.

Engine room access and layout shall be in accordance with Classification requirements and marine practice.

Two suitable unobstructed emergency exit shall be provided. The machinery space shall be lined with acoustic/thermal insulation which shall be protected against physical damage by painted aluminium sheets.

Adequate space shall be allowed for easy access to and for maintenance of machinery and electrical equipment in place and for removing items which require replacement.

Generally, the engine room finishing shall be as follow:

- Finish side wall: RAL 9003 painted aluminium sandwich panels type DI-BOND
- Floor: aluminium plates non-skid fitted on aluminium frame
- Overhead : as side wall
- Lighting: AC fluorescent type

### **4410 GENERATOR SPACE**

The machinery space also accommodate the two generators. Each generator shall be located in a sound proof housing.