



Technical Specifications

SUNPOWER-ALVA SOLAR-E 90 – Open



The following technical specifications ("Specifications") describe in detail the technical elements of the construction of the SUNPOWER-ALVA 90.

The Vessel has been designed and is built in accordance with the CE rules and in compliance with the safety standards according to EU-Directive 2013/53/EU on Recreational Craft and Personal Watercraft and a DNV Hull construction certificate.

2 Main Technical Characteristics

2.1 Dimensions and Capacities

Concept	SUNPOWER Yachts	
Naval Architecture	Sunpower Yachts International Pty Ltd	
Exterior & Interior Design	Sunpower Yachts	
Length overall	27,50 m	90,10 ft
Length of waterline	26,94 m	88,60 ft
Beam overall	13,98 m	35,80 ft
Draft	1,20 m	3,93 ft
Deck to waterlevel (bow)	3,70 m	10,86 ft
Deck to waterlevel (cockpit)	2,02 m	6,63 ft
Bridgedeck hight	1,60 m	4,93 ft
Hight over all	9,50 m	28,0 ft
Light displacement *)	85 tons	
Water *)	3.000 Liter	264-765 gal
Waste-water *)	2x 400 Liter	2x 122 gal
Fuel *)	Up to 3.000 Liter	396 gal
Standard motors (electric)	2x 350 kW, optional 2 x 480 kW	
Battery capacity	480 kWh	
Solar Input	40 kW peak	

Certification: DNV

*) Light displacement and performance predictions subject to change due to specification of vessel.

2.2 Engines and Performance

2x 350 to 2 x 480 kW electric motors

Cruising speed 10 kts

Top speed 15 kts

High-efficiency 4 blade-propellers on shafts

2.3 Tests before Delivery

Before the delivery, the manufacturer will carry out the following tests:

- Test of the electrical system

- Test of the hydraulic system

- Test of propulsion system

- Test for manoeuvring

- Test of speed at different rpm

- Test and commissioning of electronics systems

- Control and check of the correct installation and operation of all components

- All surveys required for CE or DNV must be passed

3 Construction Characteristics

Light weight glass/foam composite construction reinforced with carbon fiber, resin infusion for strong and lightweight structure high quality and osmosis resistant vinyl ester resin

Watertight bulkheads in several sections and collision-compartments for ultimate safety

Reinforced stub keel protecting propeller and rudder.

Impact reinforcements at the bow and along the keel and the waterline

Gelcoat colour acc. RAL for all GRP parts

Built in accordance to CE and DNV regulations.

3.1 Noise and Vibration Insulation

The insulation system has the purpose to ensure maximum comfort on board and to increase the efficiency of heating and cooling system. It is made of highly effective insulating materials for use in the marine environment.

Accommodation

Foam sandwich structure of boat acts as thermal and sound insulation

Engine room

All components of the exhaust system (hose, water lock, gas-water-separator, muffler) are supported by viscoelastic elements / rubber supports.

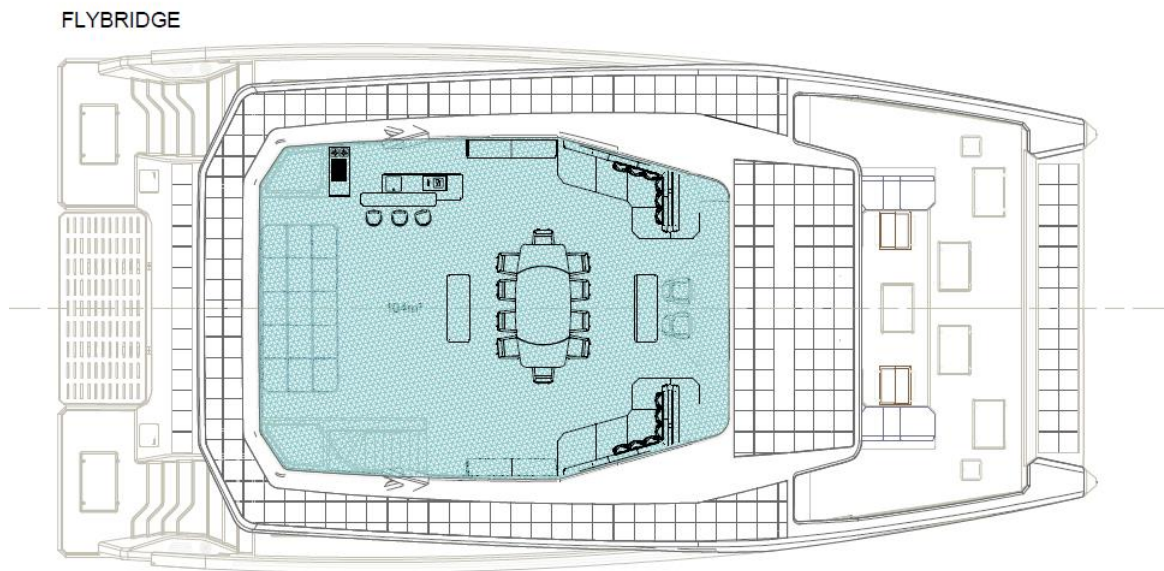
All components of the water-cooling system of Air-condition, E-motors, inverters and others are supported by viscoelastic elements / rubber supports, all cooling pumps are mounted in a way that they do not create vibrations on the hull.

4 External Layout and Standard Fittings

4.1 Fly-Bridge

- (a) 1x moulded L-shaped sofa with backrests and cushion
- (b) Large sunbed-option
- (c) 1x table and height adjustable manual table pedestal
- (d) 2x storage cabinet, fridge and sink with foldable faucet and grill (outdoor kitchen & bar, dumbwaiter from saloon and galley as an option)
- (e) 1x mast acc. specification of nav. equipment for Radar, Antennas and lights
- (f) 1x flagpole at centre
- (g) 1x flybridge stairs with stainless steel base, teak stairs and stainless steel handrail
- (h) All deck hinges with hidden bolts, heavy duty, polished
- (i) All hatches lockable, larger ones equipped with gas pistons

- (j) Switches for nav lights on the fly (lights and 2 main switches for nav. instruments, horn etc.)
- (k) Helm console fully equipped with two helm seats and bended windshield



4.2 Main Deck

- (a) 2 x molded side deck seatings
- (b) Lockers at the deckhouse with drainage and gas supported lid - intended to be used for ropes, fenders, life jackets.
- (c) Stainless steel handrail all around the deck, horizontal min. 30 mm, vertical stanchions min. 40 mm diameter
- (d) Fixed windows in laminated, shatterproof glass, bended in one direction, tinted, heat reflecting, optional with tinted glass in parasol grey.

4.2.1 Fore Deck

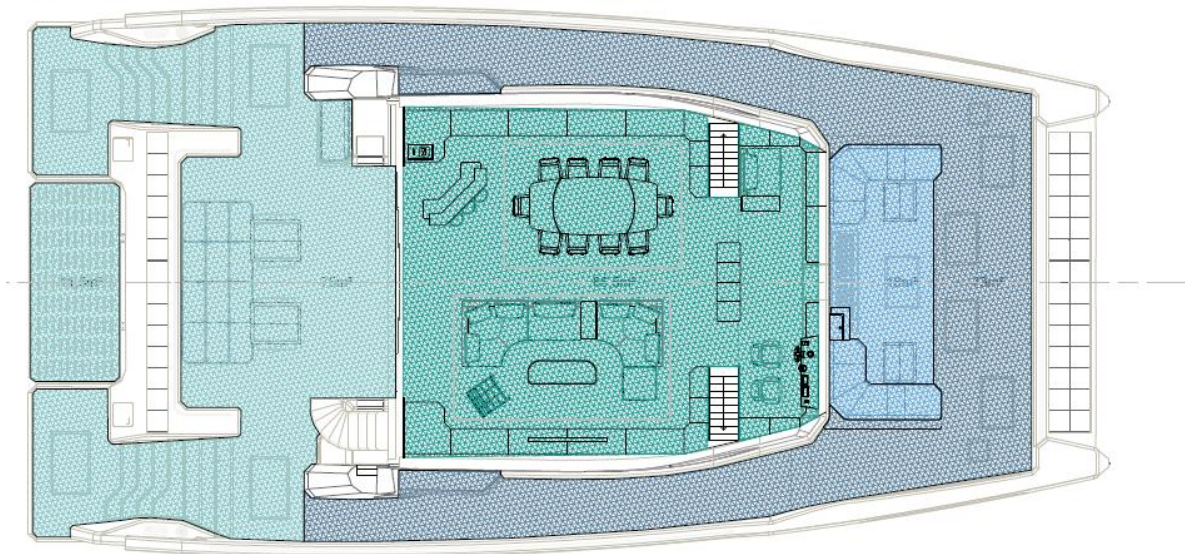
- (a) 2 x moulded L-shaped sofas with backrest
- (b) 2 x deck hatches to crew cabin, or storage space
- (c) Electrical anchor winch, vertical type for chain and rope with anchor stopper and steel bollard, local and remote controlled from the steering stations.

- (d) 1 x forepeaks / storage with access hatch, LED light + switch inside and stainless steel ladder
- (e) 1 x weathertight deck hatch to anchor winch and chain locker, LED-light in the chain locker
- (f) Crew cabin with bed, toilet, shower, air condition, LED lighting
- (g) Hose pipe (chain guide) and stainless steel anchor plate

4.2.2 Aft Deck

- (a) 1 x moulded sofa on aft side
- (b) Div. lockers for cushions
- (c) 1 x table for 6 persons & 6 chairs
- (d) 1 x stern sofa with foldable backrest-option
- (e) 1 x manual sliding salon door/window, Stainless steel, same glass as for the salon and hull windows / portlights, all parts lock able, safety lock for the entrance door
- (f) 2 x windows (as a wind and rain protection) at the cockpit sides
- (g) LED spotlights + mood light in ceiling, both can be dimmed separately
- (h) Switches for the cockpit lights
- (i) Weathertight sockets 230V + 2x USB socket
- (j) Stainless steel steps with handrail to fly bridge, stairs covered with artificial teak
- (k) 2 x moulded fiberglass doors from aft deck to stern platform, hydraulically supported to access the stern garages technical rooms
- (l) 1 x shore supply for onboard services and air conditioning located on the transom.
- (m) 1 x locker for dock water connection tap
- (n) 1 x hot/cold hand shower
- (o) Swimming ladder support installed on platform (1 x removable swimming ladder in stainless steel and teak steps included) + emergency ladder
- (p) Hi-Lo stern platform act as a tender storage with foldable supports
- (q) Dedicated storage for a life raft for 8 persons

MAIN DECK



4.3 Lower Deck

4.3.1 Aft storage

The aft storage is placed under the sun bed, access through a back-side door.

Technical Compartment underneath the toy garage

Access through a watertight door / hatch in the tender bay

- (a) Stainless steel stairs
- (b) Waterproof light
- (c) Automatic bilge pumps and alarm
- (d) Access to the rudder system
- (e) Water maker, low-pressure energy-recovery system, energy-efficient, low consumption, nearly silent, for portable water 120L/h

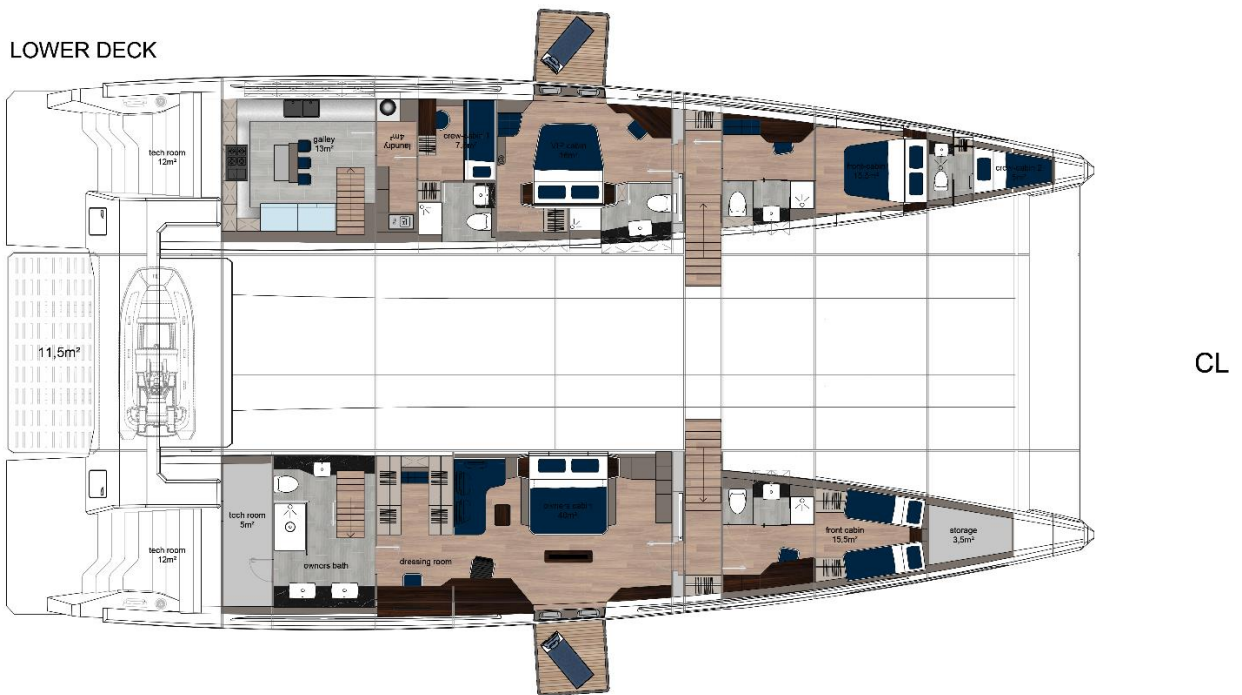
Technical Compartment II

Access through a watertight door / hatch

- (a) Short stainless steel stairs from the stern compartment down to the technical compartment
- (b) Waterproof light

- (c) 2 automatic bilge pumps and alarm
- (d) access to the rudder system and technical components like the

Air-Conditioning/ Heat pump: min. 120.000 BTU frequency driven compressor, water cooled, chilled/ warm - water, reversed cycle system, super-silent fan coils individually controlled in each cabin



Lower deck with galley down option, optional balcony

5 Interior Decoration and Fittings

5.1 Main Deck

5.1.1 Saloon | Dining | Galley

- (a) Furniture with drawers and doors according to GA and drawings
- (b) 1 x dining table for 6 persons & chairs -option
- (c) 1 x U -shaped bar with galley down configuration
- (d) 1 x C-shaped lounge sofa in the stern part of the salon
- (e) Coffee-table

- (f) Front exit weathertight door, sliding to the front – pantograph style.
- (g) Built-in stairs with handrail descending into the cabin area (see General Arrangement for reference) on port side
- (h) Built-in stairs with handrail descending into the Guest / VIP and Master cabin area and galley (see General Arrangement for reference) on starboard side
- (i) LED ceiling spotlights and LED stripes
- (j) 10 x power sockets + 4 x USB sockets
- (k) Ceiling panels in wood covered in 18 different wall panel designs
- (l) Composite-wooden floor, real wood or carpet flooring
- (m) Smart yacht system with presence sensor, lighting and an Audio server enables a great sound experience - from background music to party music. In addition, the intelligent lighting provides the perfect atmosphere for any occasion. The LED strips contribute to the indirect lighting and thus round off the overall concept of the luxurious cabin

The elegant Touch Pure switch fits seamlessly into the stylish design of this luxury cabin and allows you to control the most important functions with just one switch. With a simple click, the lighting mood can be changed, the shading can be raised or lowered, and the music can be turned up or down. In addition, the App for manual control also offers enormous added value for owners and guests.

5.1.2 Pilot Station

- (a) 1 x ergonomic leather or fabric helm seat, foldable armrests
- (b) Control dashboard and central panels including:

Steering device

1 x twin engine control throttles

1 x system display, 2x navigation displays

Thruster control, navigation lights, winch, wipers and horn controls and alarm panel.

- (c) Ceiling LED
- (d) Ceiling panels in wood covered in 18 different wall panel designs
- (e) 2 x power sockets and panels light switches, 2 x USB sockets
- (f) 2x windshield wipers

5.2 Lower Deck

5.2.1 Master Cabin

- (a) Access from salon/dining area via internal stairway
- (b) 1 x double bed with upholstered headboard, with high quality mattress (2.000 x 1.800 mm size)
- (c) Furniture in wood veneer with drawers and doors (see General Arrangement for reference)
- (d) Wardrobe with sliding or standard door
- (e) 1 x built-in sofa with cushions
- (f) Ceiling panels in wood covered in 18 different wall panel designs
- (g) Valances with folding curtains or blinds and shades
- (h) 2 x reading lights, one on each side of the bed
- (i) LED ceiling spotlights (dimmable)
- (j) Power sockets (6) and 4 x USB sockets
- (k) Composite real wood or Carpet flooring
- (l) Optional balcony
- (m) Dressing room with lockers and drawers
- (n) Smart yacht system with presence sensor, lighting and an Audio server enables a great sound experience - from background music to party music. In addition, the intelligent lighting provides the perfect atmosphere for any occasion. The LED strips contribute to the indirect lighting and thus round off the overall concept of the luxurious cabin

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5.2.2 Master Bathroom

- (a) Wood veneer furniture with acrylic solid top
- (b) 2 x wash-basin- porcelain or corian
- (c) 1 x WC in a separate room, light and air extraction with switches inside the WC-room

- (d) 1 x shower cabin separated from the bathroom, min. height inside 2100 mm,
- (e) Glass door, inox hinges, walls in white GRP, tiles or artificial stone as an option non-skid flooring in shower and LED spotlights
- (f) Wooden walls and furniture panels
- (g) Lacquered wood ceiling panels
- (h) 1 x porthole suitable for bathroom
- (i) LED ceiling spotlights
- (j) 2 x power sockets and panels light switches
- (k) Interior composite wood flooring
- (l) Mirror and mirror light
- (m) Taps
 - shower mixer tap
 - adjustable height handheld shower head and rain shower

5.2.3 VIP Cabin

- (a) Access from saloon/dining area via internal stairway
- (b) Double bed or 2 x convertible single beds with leather upholstered headboards, each with mattress (2000 x 90 mm)
- (c) Furniture in wood veneer with drawers and doors (see General Arrangement for reference)
- (d) Ceiling panels in wood covered in synthetic 18 different wall panel designs
- (e) Valances with folding curtains or blinds and shades
- (f) 2 x reading lights, one on each side of the bed
- (g) LED ceiling spotlights (dimmable)
- (h) Power sockets (4) and panels light switches, 4 x USB sockets
- (i) Composite wood or Carpet flooring
- (j) Foldable balcony as an option Smart yacht system with presence sensor, lighting and an Audio server enables a great sound experience - from background music to party music. In addition, the intelligent lighting provides the perfect atmosphere for any occasion. The LED strips contribute to the indirect lighting and thus round off the overall concept of the luxurious cabin

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5.2.4 VIP Bathroom

- (a) Wood veneer furniture with acrylic solid top
- (b) 1 x white porcelain washbasin
- (c) 1 x WC, air extraction
- (d) 1 x shower cabin, min. headroom 2100 mm, with full width glass wall and glass door with Stainless steel hinges and lock, non-skid flooring in shower
- (e) Lacquered wood ceiling panels
- (f) 1 x porthole for each bathroom,
- (g) LED ceiling spotlights
- (h) 2 x power sockets and panels light switches
- (i) Interior composite wood flooring water resistant
- (j) Mirror and mirror light
- (k) Taps:
 - 1 shower mixer tap
 - 1 adjustable height handheld shower head

Galley as “galley down” or “galley up” option

build with characteristic as below:

- (a) Acrylic solid worktop
- (b) Door finishing in wood veneer or lacquered
- (c) Galley appliances
- (d) 1 x induction cooktop
- (e) 1 x dishwasher
- (f) 1 x Fridge-freezer cold storage, chilled water, ice cubes dispenser

1 x convectomat steam-oven -option

- (g) 2 x Watertaps
- (h) 1x corian sink
- (i) Extraction hood
- (j) Drawers and lockers as per GA

5.3 Crew Area

Entrance via stairs from the aft deck.

5.3.1 Crew/ Master Cabin

- (a) 1 x bunk bed with mattress,drawers
- (b) 1 x hanging locker
- (c) LED ceiling spotlights, 2x reading light above the bed
- (d) Ceiling panels in wood covered in 18 different wall panel designse
- (e) 2 x power sockets and panels light switches, 2x USB sockets
- (f) Composite wood or carpet flooring
- (g) 1 x hatch with mosquito net and blind

5.3.2 Crew Utility Compartment in second hull

- (a) Dedicated space for Fridge/freezer or washer/ dryer
- (b) Ceiling panels in wood covered in 18 different wall panel designs
- (c) 2 x power sockets and panels light switches
- (d) Composite wood or carpet flooring
- (e) 1 x hatch with mosquito net and blind

5.3.3 Crew Bathroom

- (a) Separated facilities with

1x sink

1x WC

1x adjustable height shower head.

- (b) Furniture, wall and ceiling fixtures in laminated material.
- (c) Wooden ceiling panel
- (d) Composite wood flooring
- (e) Bathroom accessories
- (f)

5.4 Entertainment System & Smart Yacht appliances

Smart yacht system with presence sensor, auto-lights and an Audio server enables a great sound experience - from background music to party music. In addition, the intelligent lighting provides the perfect atmosphere for any occasion. The LED strips contribute to the indirect lighting and thus round off the overall concept of the luxurious cabin

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- Flexible multiroom setup with extensive audio zone groupings
- Individual music in all rooms
- Reliable and maintenance-free
- This product supports AirPlay 2 and requires iOS 11.4 or later.

The Install Speaker 7 Passive impresses with its even and wide sound radiation pattern, which means no matter where you are in the room, the sound is everywhere, exceptionally balanced and clear.

Coaxial system ensures an extremely even and wide sound radiation pattern.

Single-frame construction ensures a very compact design with minimal acoustically disturbing edges and depressions

Frequency range: 50Hz ... 28kHz

Suitable for indoor & protected outdoor use

Nominal impedance: 8 Ohm

Rated power: 40W

Maximum power: 80W

FAT32, single partition, max. 512GB

USB Harddrives:

FAT32/NTFS/EXT3/EXT4

max. 1TB, max. 500mA

MP3, AAC, ALAC, Flac, WMA, WMA lossless, WAV, M4A, OGG

up to 192kHz

max. 95% r.H. (non-condensing)

AirPlay 2, Spotify, TuneIn, internet streaming services, NAS

Line-In (analog) 6.7W

4x Speaker out 4 ... 8Ω, sample rate: 44,1kHz

1x SPDIF out (digital, electrical), sample rate: 48kHz

1x Line-out (analog), sample rate: 44,1kHz

1x Line-in (analog) sample rate: 44,1kHz

Connect up to 10 Stereo Extensions

LAN: 100Mbps, IPv4/IPv6, SSL

USB 2.0: Type A, max. 500mA

0 ... 50°C / 32 ... 122°F

- Rich and clear sound for all speaker types
- Truly expandable using Stereo Extensions and additional Audioservers

5.4.1 Miniserver for light, air-condition and blind control

The Miniserver is specifically designed for use in a marine environment.

It acts as the central control unit for yacht automation, taking care of tasks related to security, comfort, and energy efficiency. It does this without the need for any user intervention; staying true to the concept of automation.

Depending on the version, the Miniserver is already packed with technology allowing the integration of sensors and actuators for your yacht automation installation.

Control of lighting, aircon units, a projector and screen setup etc. it includes Extensions for DALI, 1-Wire, RS485 and Modbus.

LAN Interface

- IPv4/IPv6

SD Card Slot

- Industrial grade 8GB Micro-SD memory card

8x Digital Inputs 24VDC with new

push-in technology

4x Analogue Inputs 0-10V with new

push-in technology

Link Interface

(max. 30 Extensions)

Tree Interface (max. 50 Tree devices)

+ Tree Intercommunication

8x Digital Outputs (potential-free)

– 250VAC/10A $\cos\phi=1$

– 30VDC/10A

The Touch Pure Flex is your completely customized control device with up to 12 freely definable and position able touch points for your favourite functions. It has an integrated LED matrix display, three status LEDs, menus, values, text and statuses. It also includes built-in temperature and humidity sensors to support room climate control. The Touch Pure Flex is available in Anthracite and White. The Touch Pure Flex Tree/Air in Anthracite includes an additional phosphorescent light (Not available in White variants).

The Flush-mounted Presence Sensor features a low-profile for in-ceiling installation; reliably detecting motion and presence and measuring brightness levels - making it an invaluable component for yacht automation.

Detect movement and presence through infrared and acoustic sensors

High detection field with a detection angle of 360° horizontal and 110° vertical (giving you an 8m detection field at a ceiling height of 3m).

Integrated brightness sensor (measuring range 0 ... 32000lx)

Individually adjustable acoustic sensor threshold value for presence detection.

Individually adjustable acoustic sensor threshold value for the burglar alarm.

Simple limitation of the detection range using a sticker for the Fresnel lens

Whether you are using electric curtains, blinds or awnings, the new Shading Actuator Air allows you to integrate shading into your system

Suitable for blinds, curtains, shutters and awnings. With the new Shading Actuator

Fully automatic control of your curtains, blinds and awnings.

Standardised Hirschmann connector (STAS 3, STAK 3).

Fully automatic end position detection and calibration.

5.5 Systems and Material Specifications

The following technical specifications describe in detail the standard of an OCEAN ECO 90

276 Gross Tons

- (a) Headroom in the cabins, bathrooms and corridors 2.10 m
- (b) Headroom in the crew area 1,95 m, front-cabin bathrooms 1,95 m
- (c) Headroom in the saloon / pantry: approx. 2.25 m
- (d) Width of door openings (final opening inside of the installed doorframe) min. 600 mm
- (e) Large port lights and glass in glass portholes in all cabins,
- (f) Deck-hatches in all cabins incl. crew area integrated 'flush deck' with mosquito net and blind
- (g) Natural aeration and forced aspiration-system in all cabins / bathrooms, slow turning and silent fan
- (h) Interior furniture built in lightweight materials, light plywood, foam core or honeycomb where applicable.
- (i) All walls lacquered or covered with wood, vinyl leather
- (j) Standard interior with mix of modern veneer with white lacquered surfaces and composite-wooden floors

Decor wall panels will be in vinyl leather optic. Stainless steel / leather applications inside

- (k) Wooden floor and walls as an option
- (l) Handrails in Stainless steel, optional covered with leather at staircases
- (m) All cabin- and bathroom doors in light weight material, high quality, soft closure, magnetic fixation
- (n) Shadow blinds for all windows
- (o) 18 different wall panel designs screen for all deck hatches incl. Mosquito net and blind

5.5.1 Upholstery, blinds, and fabrics

All the sofas, chairs, armchairs, and bed heads can be selected by the customer amongst the standard decor and material samples or similar present at the shipyard showroom.

- (a) Folding curtain's fabric

External covers in canvas

- (b) Synthetic leather
- (c) Internal fabrics
- (d) Crew quarter with fabric upholstery

5.5.2 Floors

The floors are covered with:

- (a) Floor carpet or modified composite-wood
- (b) Interior wood veneer different design, composite material for light weight
- (c) Exterior synthetic teak or modified wood

5.5.3 Mirrors

All mirrors provided and installed are in glass as in the General Arrangement.

5.5.4 Door Handles

Door handles from stainless steel, cylindrical locks and hinges.

5.5.5 Bathroom Fitting and Accessories

- (a) Taps and shower kit are provided and installed in chrome finishing
- (b) Sinks are supplied and installed from corian
- (c) Top in Acrylic solid surface
- (d) The shower floors in non-skid flooring

5.5.6 Woods and Laquering

- (a) Wood veneers can be selected by the customer amongst the standard decor and accessories samples
- (b) Lacquered surfaces are to be considered in various RAL colours

5.5.7 Toilet Units

Electric Toilets- 24V white porcelain bowl

5.5.8 Electric System AC

Kitchen appliances Simens, Bosch or similar

- (a) Induction cooktop with extractor hood
- (b) Side by side refrigerator / freezer
- (c) Dishwasher
- (d) Washer-dryer
- (e) AC Sockets inside
- (f) Capacity indicator for all tanks and batteries

- (g) Grounding plates
- (h) Shore connection/socket IP 54 , Polarity detection for shore power

5.5.9 Electric System DC

- (a) Navigation light Stb + Port
- (b) Navigation light steam toplight
- (c) Navigation light stern
- (d) Navigation light anchor
- (e) Interior Ceiling light
- (f) Electric light dimmable
- (g) Reading and chart lights
- (h) LED strip
- (i) Exterior ceiling lights at cockpit and fore deck
- (j) Beauty lights at mirrors in each bathroom
- (k) Pilot console at the Flybridge
- (l) Windlass vertical for one ground tackle gear
- (m) Anchor Windlass remote/radio controlled
- (n) Switches on fly and inside helm
- (o) 2 x grounding plates
- (p) Windscreen wipers Stainless steel with water spray set, rubber wiper blades
- (q) Generator starter battery - 125Ah 24V GEL - Starter Genset
- (r) Battery switch
- (s) Electric valves for blackwater tanks, operated from main panel
- (t) All lights high quality LED
- (u) Bilge pumps with switch and fuse panel
- (v) Bilge alarms with switch and fuse panel
- (ww) Pumps for black tanks with switch and fuse panel, Tank sensor

6 Energy Production and Storage

High voltage DC Battery sets for main storage, MPPT- charge controller, solar panels, inverters, e-motors, generator

6.1 Solar Power

High-efficiency solar-panels in total for propulsion and hotel loads, total =
39,4 kW peak

33 MPPT solar charge regulators

6.2 Electric Power Storage

High voltage DC Battery set 760 V for main energy storage with a capacity of about 360 kWh up to 480 kWh

Battery liquid cooling system, automatic fire system, dedicated storage / batterie room

Battery Management System

Each battery module comes with an integrated battery management system (BMS). This is an intelligent electronic module, that measures all cell voltages and temperatures to control balancing on both battery cell and module level. The battery modules communicate by a galvanic isolated CAN-Bus with the Master BMS, which collects and monitors the status of all battery modules. If the measured values from a battery module exceed the limit, the Master will automatically act to protect the connected battery modules.

Monitoring and control EM-Display monitors all battery systems. The high-resolution display with integrated touch screen shows all important battery parameters immediately.

6.3 Range Extender

Generator as range extender 2x 110 kVA- gen-set for batterie charge enable the vessel to sail at cruising speed

In order to reduce the noise, it is fitted with an insulation housing, a water lock, silencer and special silencer blocks.

The gen-set is a three phases marine generator assambled on a 4 cylinders turbo intercooler DEUTZ or similar engine block that performs 89,9 kW - 112,4 kVA at 1500 rpm and 50 Hz. This is a heavy duty generator suitable for the most demanding commercial boats which require a marine generator capable to work on continous duty, more than 3.000 hours/year. It is available with sound

shield, a heavy duty, comfortable, with a wide range of kits, with synchronism for parallel operation, and type approval DNV from IACS.

KVA	112,4 KVA
Max RPM	1500 RPM
Maximum active power	90 KW
Frequency	50 HZ
Phases	Three-Phase
Total lenght with canopy	2007 MM
Total width with canopy	865 MM
Total height with canopy	1048 MM
Total lenght without canopy	1760 MM
Total width without canopy	865 MM
Total height without canopy	1011 MM

6.4 Service Batteries

24 V service Li-ion batteries, including Batterie Management System.

7 Navigation Control Systems and Electronics

7.1 Wheelhouse

- (a) Steering station control panels including:
- (b) Start/stop motor switches
- (c) 1 x electronic twin engine control handles
- (d) 1 x display for motor and batteries
- (e) Magnetic compass - or similar
- (f) Navigation, position and dashboard light switches
- (g) Horn control
- (h) Fuelfilter control
- (i) Bilge alarms
- (j) Windshield wash/wiper controls

7.2 Flying bridge steering station

- (a) Display for Navigation, Motors, Systems and Battery
- (b) Full set of navigational equipment
- (c) Winch and anchor controls.
- (d) Magnetic compass
- (e) Switches for lights, anchor, horn etc.
- (f) Electronic twin motor controls

8.1 Fresh Water System

- (a) Fresh water tank 2x 400 L with manhole
- (b) Water pump + filter
- (c) Water pressure system
- (d) Electric water heater
- (e) Shower mixer tap with shower head
- (f) 1 x transom shower
- (g) Acrylic worktop sink for galley
- (h) Sink bathrooms, top mounted,
- (i) Taps at bathrooms
- (j) Shower drains at bathrooms hidden under acrylic / stone cover
- (k) Deck filler for water
- (l) Tank ventilation and filters
- (m) Hose clamps Stainless steel, for pressurized water, fuel, blackwater

8.2 Grey and Sewage Water System

- (a) 2 x ca. 400 liters grey water tanks, 2x ca. 400 liters black water tanks manhole with aluminium lid, level sensor
- (b) 4 x self-priming 24V pump for automatic or manual tank discharge
- (c) 3-way valve for deck discharge
- (d) Deck fitting waste water for discharge

- (e) Grey/ Black water system connecting tank with toilets, wash basins, sinks, showers, dishwasher and washing machine
- (f) Shower drain kit
- (g) Anti-odor charcoal filter on tank vents

9 Bilge System

- (a) Self-priming electric bilge pump units at hulls
- (b) Bilge alarms
- (c) Manual bilge pump at stern cockpit
- (d) Hull fittings with composite ball valves
- (e) Control panel at salon helm

10 Firefighting and Fire Protection Systems

- (a) Fixed automatic fire extinguisher: 1x generator, 1x battery compartment
- (b) Fuel shut-off remote control at helm station
- (c) Fire extinguishers in each cabin and salon
- (d) Fire detection units in each cabin and salon
- (e) Fire blanket for galley

11 Steering System

- (a) Rudder shaft stainless steel massive stock
- (b) Lower and upper rudder bearing
- (c) Shaft sealing
- (d) Rudder tube
- (e) Steering pumps on fly helm and salon helm
- (f) Steering pump flange
- (g) Venting valve for steering pump

- (h) Balance valves with bypass function
- (i) Hydraulic rudder cylinders
- (j) Steering wheels
- (k) Hydraulic tubes
- (l) Hydraulic tube support sleeve
- (m) Stainless steel rudder arm and components

12 Grounding Systems

4-6 Grounding plates for AC and DC systems and lightning protection

13 Fuel and Oil Systems

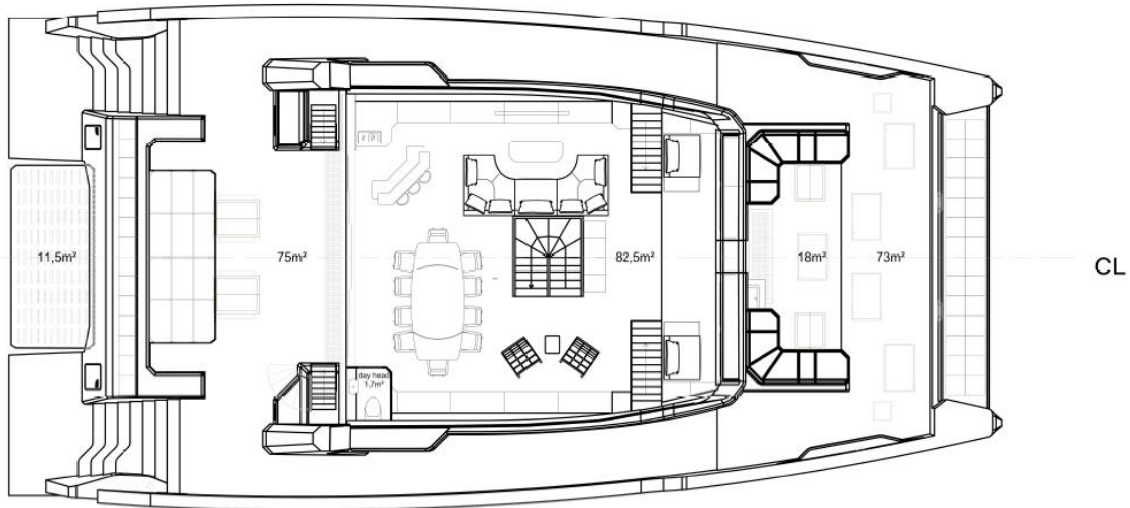
- (a) Fuel deck fill station molded in superstructure, covered with a lid
- (b) Fuel tanks Stainless steel, manhole: ca. 4 x 400 Liters (optional 8x 400 ltr.) with inspection tubes at tank
- (c) Ventilation pipes with odor filter
- (d) Fuel manifold valve
- (e) Diesel pre-filters and generator filter
- (f) Fuel transfer pump with filter
- (g) Electronic level gauge at main dashboard and at deck fill station
- (h) Fuel hose for marine fuel
- (i) Double hose clamps Stainless steel

14 Deck Hardware

- (a) Fender profile for hull outside and platform
- (b) Anchor bow roller with secure pin
- (c) Padeyes for anchor bridle
- (d) Cleats main deck in Stainless steel
- (e) Anti-chafing-protection plate Stainless steel
- (f) Retractable cleats at aft platform

(g) Deck fully covered with artificial teak

MAIN DECK



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