

Description Mercedes Benz Unimog U500

Global Expedition Vehicle

Living Module

A) The structure of the living module

- Walls made of very thick sandwich panels with great thermal insulation (6cm)
- Galvanized steel corner plate reinforcements around the entire exterior perimeter of the living module to avoid friction and small bumps. These reinforcements do not surround the 100% perimeter of the module (see photos) to avoid distortions due to expansion and to allow minimal bending of the module.
- Due to the unique characteristics of the Unimog U500 chassis, the living-module to chassis fixing is central and floating, so that possible torsions of the chassis in off-road practice are not transmitted to the living module, for example, in situations of axle crossing. Therefore, there is an increased protection of the living module
- This module has the rear part with an angled cut shape to maintain the largest possible "departure angle" for the vehicle in Off-road practice
- The floor of the house is made of charcoal color Plynil.
- A truck + living module manual done by the owner is available, with photos, instructions and recommendations





B) Essential base equipment

This expedition vehicle is designed precisely for that; worldwide expeditions... to places that can be very remote and where it is essential to:

- Have the ability to be self-sufficient for days
- Have redundancy in essential systems such as those related to electricity, heat and diesel in cases where a system stops working or has a breakdown.
- It must also be able to be operational in very different countries (which is why it has been chosen not to have gas since the gas systems and couplings differ enormously from one country to another).
- This is why the entire home works with appliances and outlets at 12V, 125V and 220V.
- It also has 2 MARINCO MARINE exterior sockets to connect to exterior electrical networks at both 220V and 125V, and in systems with or without polarity in the supply.

Based on these premises, the vehicle has the following items in the following areas



1. Electricity

a) Plugs and sockets inside the home

- The home has different types of interior plugs in different locations:
 - 220V plugs
 - 125V plugs
 - 12V car cigarette lighter sockets

b) Set of 3 batteries

- The system is based on a battery system of 3 AGM batteries (originally from the Lifeline brand, recently changed to new AGM from the Mombat brand in 2021, due to the age of the previous ones), connected in parallel (12v).
- Each AGM battery has a capacity of 210-amp hours at a rate of 20h and a discharge capacity of approximately 15 amps at 680 minutes for a single battery.
- The set of 3 batteries therefore allows a rate of 630-amp hours with a capacity of 20h.
- They are placed in a drawer together with the chargers/inverters and the Webasto heating located under the left dining seat. It has a ventilation system and fan regulation thermostat.



c) Solar energy (Electric energy source 1)

- 2 solar panels on the roof of the housing module
- The system has a charge regulator and control of solar panels in the home with a dedicated display

d) Power from the truck's own alternator (Electric energy source 2)

- The truck's alternator charges the 3 batteries of the truck itself when it is running (+ its two small auxiliary batteries for the electronics).
- The set of 12V truck batteries are connected to the set of home batteries through a three-position separator relay (OFF/disconnected, ON/connected, AUTO/only) allowing the charging of the home batteries through the alternator when those on the truck are already loaded, but does not allow reverse connection.
- In case of emergency, with the ON position you can start the truck with the home batteries. Or in case of emergency with the home batteries, the Fischer Panda Diesel Generator can be started with the truck's batteries and alternator.

e) External energy connected to local electrical network (Electric energy source 3)

- The vehicle has two exterior sockets next to the driver's door. One to connect to 125V and another to connect to 220V power grids.

- Inside the vehicle, in the battery and electricity area under the left bench on the dining room, there are 2 independent chargers/inverters. One for charging with 125V and another for charging with 220V (more on this later).

f) Power with built-in diesel generator (Electric power source 4)

- See below the section Fischer Panda Diesel Generator
- The Generator has a Master Switch for connection and disconnection and an exclusive generator load control system.

2. Equipment for electrical energy

a) Set of 3 batteries

- As previously mentioned, the system is based on a pack of 3 AGM batteries (originally from the Lifeline brand, recently changed to new AGM from the Mombat brand in 2021, due to the age of the previous ones, connected in parallel (12v)
- The housing battery set has a 3-position truck battery separator relay (ON/OFF/AUTO).

b) Solar charger and control panel

- The solar panel system has a charge regulator and a display on the status of the charge and batteries
- - The system is also connected and managed by the general control system of the entire MATE2 system (see below)

c) A complete Outback Power Systems charging/inverting set composed of:

1. Inverters/chargers

- There are 2 independent chargers / inverters with individual disconnectors. Top brand Outback Power Systems MX/FX- 60/80
- FX/VFX/GTFX/GVFX/Mobile models
- Each inverter has a Master Switch for connection and disconnection and an LED display on its operating status



2. Flexmax 60/80 by Outback Tracking Charge Controller

- It also has a Flexmax system with an external display to know its status, charging or discharging status, external connection or not, and battery status. There are two, one for each inverter.

3. MATE 2 and HUB and whole management system

- System Controller and display associated with Flexmax

4. BEP Marine display, panel and switches

- BEP MARINE battery management, charging and discharging system model BEP 600-DCM. Designed for yachts and expedition vehicles
- 2 units. One for 125V and one for 220V
- It has a polarity reversal alert system
- The system also has 3 control panels and differential switches/automatics for the different vehicle systems
 - One of them with its automatic devices for 12 V consumption
 - Another with its automatic devices for consumption at 125 V
 - Another with its automatic devices for consumption at 220 V

5. Manual and automatic management panel of the system and the Fischer Panda Model AGT 4000 PVMV 12V Diesel Generator

- Designed for installation on vehicles and yachts
- It has an interior generator management panel with manual start or shutdown and an automatic management system by the general control Hub of the MATE 2 system when it detects low battery level.
- The panel has oil pressure indicators and other generator operation indicators.
- The generator has less than 1-hour of usage in its entire lifetime
- The Generator has a Master Switch for connection and disconnection



3. Water

a) Fresh water

- The living module has a clean water tank of between 400 and 500 liters. This water tank supplies the kitchen and the bathroom with its shower and Thetford toilet. It also feeds the filter for drinking water with exclusive tap in the kitchen.
- Clean water tank measurement display
- Vacuum pump to power kitchen and bathroom faucets and external shower
- Top opening system for tank cleaning
- 2 water loading systems from the tank and water connection to the external supply system

b) Gray and Black water

- It has a double gray water tank with a common outlet in motorhomes in the rear left corner and another outlet in front of the left rear wheel with a handle in the Thetford cassette receptacle where the black water is collected.
- Gray water tank measurement display



c) Hot water

- For the production of hot water, the module has a stainless steel Isotemp thermos from the Indel Marine brand.
- Water heating can occur in three ways:
 - By the coolant from the running Unimog that circulates through the thermos
 - Through that same liquid when the generator works since its cooling also heats the water in the thermos
 - By electrical current since it is also plugged into an electrical outlet

4. Diesel

- In addition to the standard Unimog diesel tank, the living module has another additional 150-litre diesel tank with a dedicated gauge
- Auxiliary diesel tank measurement display
- This additional tank feeds the different Webastos of the living module and the Fischer Panda generator.
- It also has a pump and connector with the main tank to transfer diesel from the auxiliary tank to the main tank while driving using a switch on the Unimog control panel in case the truck needs more fuel



C) Habitability

1. Kitchen

- Fully equipped kitchen including crockery and glasses, kitchen cabinets and drawers to avoid movement while travelling
- The kitchen includes:
 - Vitro-ceramic cooking plate, Webasto Diesel Cooker X100. Includes high efficiency system for cooking at quite high altitude over 2500 m. Its fuel is diesel from the auxiliary tank
 - Convection Oven + Microwave + Grill General Electric JES1290. Allows use as a simple convection or microwave oven, grill or combination oven
 - Vitrifrigo DW2- DTPF large-capacity dual-zone independent refrigerator and freezer
 - Elkay stainless steel sink with closures for work area
 - Special tap for filtered drinking water (Flomatic Filter model FM2 BVC-TM)



2. Bathroom and shower

- Bathroom
 - with wood finishings
 - drawers

- bathroom cabinet with mirror
- with window
- roof skylight
- including:
 - Sink
 - Towel racks
 - Gel and shampoo dispensers
 - Shower
 - Toilet with Thetford C 403-L cassette

3. Living/Dining room

- Two double benches covered in blue and gray Alcantara
- Wooden table with double pivot system to move to different positions and anchoring system in various positions.
- Dining area closet and side magazine racks
- Two reading LED lights on each side bench

4. Entertaining

- Belson TV with remote control and HDMI
- DTT decoder
- DVD CD Player JVC Model KD-ADV5580
- TV antenna Model TERK TV55 (on the roof of the housing module)

5. Bed/s

- Transverse queen-size bed in the rear area of the cabin
- High quality mattress and bedspread
- Storage department hidden under mattress
- The living room dining area can be converted into an extra bed whenever necessary

6. Storage

- a. Indoors

- Large interior storage areas (upper, at the head of the bed, under the bed with organization boxes, hanging wardrobe, kitchen area, bathroom, etc. etc.

b. Outdoors

- Two exterior stainless-steel drawers in the rear right and left corners of the module
- Large exterior rear trunk that also includes storage areas (under the interior bed) with organization boxes

7. Windows, skylights and ventilation

- It has 4 rectangular burglar proof glass windows and security closures, two in the back in the bed area and two in the front area in the living/dining room. Two on each side of the vehicle.
- The windows have a 3-position system: Closed, Open, or Half-open with a safety lock that cannot be operated from the outside in order to maintain interior ventilation in safe conditions.
- It also has a same type window in the bathroom
- It has 1 large skylight in the front (Cover/Dining Room) and another in the bathroom
- Mosquito nets on all windows and skylights. All of them also have shades and closure against light. All windows are equipped with mottled vinyl that allows visibility to the outside and prevents visibility to the inside.
- The main access door has also a mosquito net.

8. Accessibility

- Retractable ladder with safety fixings
- Upper light (Froli Led Entry Light Unit) above the stairs with light sensor and proximity sensor for automatic deployment
- Double sliding handrails from the right to the left of the staircase for safety and to prevent falls on the stairs (as it is still high due to the dimensions of the vehicle)
- House door with mosquito net
- 2 external side stainless steel stairs to access the roof top that also reinforce the structural strength of the module

9. Comfort

- Great structural insulation due to the thickness and quality of the insulation of the sandwich panels that make up the module
- Hot/cold air conditioning (electric). Carrier Air-V Recreational Vehicle Air Conditioner
- Skylight/ceiling fan (Dometic Fan-Tastic 6600R, double function to introduce or extract air with Off, Manual and Auto positions). Operable by remote control, programmable and with a rain sensor for automatic closing if necessary.
- Webasto Heating (Diesel) Air Top EVO 5500 D.

D) Security

1. Safety of the vehicle, the cabin and its occupants

- Burglar proof windows
- Home volumetric alarm (associated with alarm with vehicle's geolocation) Gemini Alarm Systems - detection, alarm and geolocation GSM and Google Maps
- Exterior Adhesive Stickers notice remote surveillance, geolocation and video recording
- Four exterior cameras to monitor the entire perimeter of the vehicle from the inside both day and night, with a screen in the bed and kitchen area (three of them in common with the driving cameras plus a fourth that replaces the long rear mirror camera with a front that has no use for driving)
- Two CBE gas detectors, MTG brand (possible dual application of GPL/numbing gases). Although this vehicle does not use gas for cooking, these 2 detectors are used to alert against numbing anti-intrusion gases, 1 in the upper area of the module near the bed window and another in the lower area under the kitchen

2. Security safes

- DES 93575 digital security safe inside the wardrobe
- Hidden safe on the outside of the vehicle



E) Supplementary (miscellaneous) equipment:

- Gate with direct passage from the cabin to the living module, with a tilting lid to isolate both areas and also with a roll-up fabric closure from the housing module.
- When the Unimog cabin is open (tilted forward to have access, for example, to the engine), the area where the flap passes through to the opening of the cabin (which has been moved forward and tilted) has a roll-up rubber protector to prevent water entry in case you have to do this operation outdoors in inclement conditions.
- The dining room area can be converted into one more bed by removing the table (therefore 4 people can sleep in total, although for circulation the vehicle is designed for 2 passengers).

- White canvas covering that can be erected manually on either side of the truck, fixed with octopus ties on the top and pegs in the ground, to create an outdoor shaded area when desired.
- Various accessories in the rear trunk and in the exterior rear side boxes made of stainless steel

