Schedule of Requirement and Technical Specifications

**AMBULANCES OF FIRST AID TYPE B 4x4**

**1. GENERAL REQUIREMENTS**

The ambulance has to meet the norms for special vehicles; by ambulance, type B 4x4 it is understood an ambulance of emergency medical assistance.

**1.1 Norms and standards**

The legislation applied in the development of technical specifications:

* Law of the Republic of Moldova about health protection no. 411 from 28 March 1995;
* Law of the Republic of Moldova about medical devices no. 102 from 9 June 2017;
* Order of the Ministry of Health of the Republic of Moldova no. 739 from 23.07.2012 with regard to the regulation of the authorisation of medicinal products of human use and introduction of amendments post-authorisation;
* European Norm **EN 1789/2007**, A2 edition with regard to medical vehicles and equipment with subsequent amendments;
* Medical devices have to meet the requirements foreseen in the European Directive 93/42/CEE on medical devices;
* The medical devices will correspond to **EN 1865** (specifications for stretchers and other equipment for transporting patients by ambulances), when other indications are not given.
* Medical devices have the following:

a) Declaration of conformity European Communities issued by the manufacturer for the produced medical device;

b) Declaration of conformity European Communities in force for produced devices, where appropriate;

* Manufacturers of medical devices will follow the quality standard **ISO 9001/2008** (quality management system) with subsequent amendments.
* Participants will make available the tests' results for fastening the stretcher, chairs, medical and non-medical devices, etc. issued by a notified certificated body: for similar samples in similar configurations. Fixation tests theoretically calculated will not be accepted instead of dynamic crash and fixation tests. Crash tests of separated chassis performed by the manufacturing company of the chassis cannot replace the fixation tests required according to EN 1789.
* For the ambulance (in the bid documents) can be accepted the proofs for tests' results certified by a notified body if prototypes similar to these in the bid were delivered previously (with the delivery proof).

**1.2 Steering circle:**

The vehicle will have a steering circle set by the manufacturing company of the car’s body.

* 1. **1.3 Type of the car’s body**

The ambulance will be built from a single piece of van type with an integrated cabin (added containers or compartments for patients are not allowed). The roof-superstructure made of plastic is not accepted.

1. **PERFORMANCES**

**2.1 Engine:**

* Cylinder capacity of the engine maximum 2200 cm3
* Fuel: less polluant
* minim Euro 5+
* minimum 120 kw
* the engine has to ensure that the ambulance, loaded up to a maximum allowed capacity, is able to reach an acceleration from 0 km/h to 80 km/h within an interval of **30** seconds
* metallic protection under the group of power plant, at least in the oil bath zone.

**2.2 Security systems:**

* Anti-lock braking system (ABS)
* Electronic Stability Program (ESP)
* Assisted servo
* Parking Assist Control

**2.3 Traction:**

* Manual gearbox, minim 5+1 speed.
* The ambulance will have 4x4 traction manual or automat selectable.
* The ambulance will be equipped with steel wheels, winter/summer tire sets and spare wheel of normal size.

**2.4 External appearance:**

* The ambulance will be of white colour with the following inscriptions and marks:

**On the forward part:**

AMBULANȚA, printed reversed (blue colour with a height of 150mm); the international sign of Emergency Medical Assistance Service „Star of Life” (six blue arms, height 300 mm and width 90 mm).

**On both parts of the car body:**

1. The international sign of Emergency Medical Assistance Service „Star of Life” (six blue arms, height 300 mm and width 90 mm);

2. „ASISTENȚĂ MEDICALĂ URGENTĂ” (height 130 mm, blue colour);

3. National unique number „112” (red colour, height 240 mm);

4. Bands (orange colour, height 150-230 mm each (depending on the height of the ambulance)).

**On the back part:**

„AMBULANŢA” (blue colour with a height of 150mm);

On the window - two international signs of Emergency Medical Assistance Service „Star of Life” (six blue arms, height 300 mm and width 90 mm).

* the inscription is reflective / fluorescent.

1. **ELECTRICAL REQUIREMENTS**

**3.1 System for visual and acoustic alarm**

* + The ambulance will have both visual and acoustic warning system.
  + The system will allow the possibility to broadcast the necessary piece of information to the people outside the car by using a microphone from the driver's cabin.
  + The system will be designed so that the siren will not be operational unless the light bar will be in operation.
  + The various components of the vision warning system will be electrically powered by means of a general switch, which will connect the alarm system to the electrical system of the vehicle.
  + The alarm system will be operational even if the engine is stopped.
  + The lights signals will follow the technical requirements stipulated in R 65 CEE - UN.
  + The forward part of the ambulance will be equipped with a blue stroboscopic light bar of LED type, fixed above the drivers’ cabin. It will be visible from the forward and lateral parts of the ambulance. A loudspeaker for siren with a minimum output of 100W, with variable acoustic signal strength.
  + On the back part, the ambulance will be equipped with a blue light bar of LED type, visible from the back part. The operation will be put in place through a unique button with that of the main light bar.
  + On each lateral part, at the top of the ambulance, there will be placed three intermittent, rectangular blue LED lights. The operation will be done through a unique button with that of the main light bar.
  + Between the main headlamps, embedded in the radiator mask or on the hood, there will be attached two blue LED lights, intermittent, oriented towards the front of the vehicle. The operation will be done through a unique button with that of the main light bar.
  + The lateral right side and the back side of the ambulance each will have one LED light bulb, oriented towards the ground under an angle of 45 degrees. The operation will be put in place through separate buttons for each group (right-lateral and back) located in the driver's compartment as well as at opening the door.
  + The siren will be put into operation from the driver's compartment having an on-off general button. Also it will include a short warning signal, which is put into operation by pressing a button (horn). The power of the siren will be of minimum 100 W, with variable acoustic signal intensity. All warning systems, both acoustic and light, will be controlled from a control panel.
  + The ambulance will have fog bulbs installed.

**3.2 Battery and alternator**

* + The construction of the battery and all its connections will be designed so that it prevents a short circuit due to lack of attention.
  + The electrical system must be able to store a reserve of electricity to restart the engine. The ambulance must have installed at least one more battery (additional).
  + Minimum capacity/power (according to EN 1789 with subsequent amendments).
    - Starting battery: rated voltage 12 V min. 80 Ah
    - Additional battery: rated voltage 12 V min. 80 Ah
    - Alternator: minimum power 1200 W/12 V

**3.3 Electrical installation**

* + 1. The ambulance will have in its structure an external connector, with a protection degree type IP-65, to make possible the charging of battery(ies) and other equipment, medical devices, to preheat the engine when stationary and to heat the patient's compartment.
    2. The connector for 220V will be of “male” type and will be installed on the lateral side of the ambulance on the driver’s side. As well, two connectors of “female” type will be delivered each having an attached cable of at least 20 m in length.
    3. The starting of the engine will not be possible as long as it is connected to an external power source of 220V.
    4. The electrical system of the ambulance must contain at least four separate sub-systems as follows:
* Basic system for the unequipped vehicle.
* Power supply system for medical devices.
* Power supply system for patient’s compartment.
* Power supply system for communications.
  + 1. Plugs for consumers supply will be foreseen as follows:
* Plugs of 12 V for the medical devices in the patient's compartment - minimum 4pieces.
* Plugs of 12 V in the driver's cabin – minim 2 pieces.
* Plugs of 220 V for the medical devices in the patient's compartment - minimum 4pieces.
  + 1. The electrical installations will meet the following requirements:
* All circuits in the patient's compartment will have automatic safety devices and/or separated switches designed/foreseen within the construction.
* The switches must be properly marked and the function of each circuit will be easily identifiable.
* At least two circuits will be in place so that a circuit breakdown does not switch off all the lights or all connected medical devices.
* The wiring must withstand more than the maximum load of the fuses or the switches with a minimum of 30%.
* The wiring and the pipelines must withstand vibrations. The cables have to be installed in the pipelines.
* The cables will not cross areas where gaseous substances are used.
* The outputs will not be interchangeable in places with systems of different voltage.

**4. THE BODY OF THE VEHICLE**

**4.1 Security against fire:**

All the materials used inside the vehicle must be fire resistant; their firing rate has to be of maximum 100 mm/min.

* 1. **Driver’s cabin:**

The cabin will be equipped with the following:

- Windscreen de-icing/demister system operating while the ambulance is stationary or in motion.

* + - An external windscreen washing system.
    - Ventilation and air conditioning system.
    - Two sunshades.
    - A handhold for the accompanying person located near by the lower corner of the windscreen and a handhold above the entrance door.
    - Airbags for the driver and the passengers.
    - Double bench for the passenger.
    - Electrically regulated and heated rear-view mirrors.
    - Radio, Bluetooth.
    - Navigation system and the corresponding software for the territory of the Republic of Moldova.
    - Rechargeable and detachable torch.

**4.3 Minimum loading capacity:**

The number of chairs and/or stretchers (exempt from the driver):

* + 2 in front with seatbelts;
  + 2 behind (to which a patient on the stretcher is added). The chairs will have seatbelts in three points, the chair oriented with the back towards the driving direction will have the seatbelt caught in 2 points, and the stretcher will have seatbelts fastening system, including from the stretcher’s head over the patient’s shoulders. A package for children must be included.

**4.4 Partition wall:**

* + A partition wall will separate the driver’s compartment from that of the patient. A sliding window will be foreseen in the partition wall. The window will allow the direct visual contact with the driver. It will be secured against accidental opening and will have an opaque curtain or other devices, which would prevent the light from the patient’s compartment to disturb the driver.
  + The portions of walls outside the windows above the stretcher level (including the cupboards and drawer faces) will be made of washable material resistant to disinfection.

**4.5 Emergency exits:**

* + Besides the back door, there will be an alternative exit from the patient’s compartment, which would allow the evacuation of the patient (patients) and the team.

**4.6 Openings (doors, windows):**

* + Minimum two exits must exist:
    - one in the back part (swing doors)
    - one lateral exit (door) at the patient’s compartment.
  + The doors from the patient’s compartment must have the possibility to be maintained in an open position.
  + The rear doors should allow an opening at 250 - 270°.
  + All openings will be equipped with seals against water infiltration.
  + The stretcher’s loading angle will be of maximum 16º.
  + The ambulance’s doors will be equipped with centralised locking.
  + The external doors from the medical compartment must be equipped with security devices according to the requirements:
* to be opened and closed from inside without a key;
* to be opened and closed with a key from outside the same as when doors are blocked from inside;
* the key may be mechanical or non-mechanical, in case if there is a centralised locking system.
  + At least two exterior windows should be in the patient’s compartment, one have to be on the right side and one-two on the backside. The window on the lateral side will be a sliding one.
  + The windows have to be located so that they ensure patient’s privacy, and 1/3 of the top of the window will allow to see outside.
  + In case when the doors from the patient’s compartment are not completely closed or are opened, an audio and visual signal will alert the driver.

**5. PATIENT COMPARTMENT**

**5.1 General requirements:**

* + The patient’s compartment must be designed and built so that it ensures necessary space for the medical devices mentioned bellow.
  + The ceiling, the inside walls and the doors of the patient’s compartment must be produced completely from or covered with washable materials resistant to disinfection.
  + The material used inside the ambulance (patient’s compartment) has to meet the requirements stipulated in the standard EN 1789.
  + The compartment of the ambulance must be designed so that 2-4 people are able to carry out their activity in a vertical position, in comfortable conditions.
  + The edges of the surfaces must be designed or sealed against the ingress of fluids. If the floor does not allow the fluids drain, one or more leaks with stopper/stoppers must be available.
  + The open shelves must be designed with rounded edges. Drawers must be secured against accidental opening.
  + The ambulance must be equipped with a compartment for medication designed with a safety lock.
  + The ambulance must be designed with one or more handholds positioned above the stretcher on the longitudinal axis.
  + There must exist 2 handholds positioned near the doors of the patient’s compartment:
    - one handhold installed on the partition wall near the lateral door;
    - the second handhold installed on the lateral wall near the rear doors.
  + The entrance into the medical compartment through the rear doors must be facilitated by an installed metal step.
  + The maintenance equipment (ex. spare wheel or toolbox) will not be accessible from inside the patient’s compartment.

**Description:**

With regard to the medical compartment from the rear door’s part of the vehicle the following specifications have to be followed:

* + The wall on the left side (from the driver's side) will be used for attaching the medical equipment or the holders and chargers for the portable medical equipment such as defibrillator and its annexes, fixed vacuum secretions, automatic syringe - syringe, oxygen supply system - humidifier flow meter. All devices installed on the left side wall must be accessible manually and visible to the person who is standing on the chair located at the stretcher's head. In case when the configuration allows, a cupboard will be placed for sanitary materials.
  + On the right side wall, at the level of half upper of the stretcher, will be attached a folding seat for the accompanying person with the possibility to spin towards the stretcher, the seatbelt will be attached by the seat. Some immobilization equipment will have the possibility to be attached on this wall behind the seat of the accompanying person.
  + The ceiling of the medical compartment will be used for attaching the support for infusions.
  + The partition wall will be used for attaching a chair with its back towards the driving direction. A container will be placed on this wall for used materials, which should be easy to empty. As well, in this zone there will be a special place for storing the suitcase with resuscitation/examination equipment. It will be easily accessible from outside by opening the lateral door. Also, in this zone there will be placed a container for sharp materials, a disinfectant dosing device and one support for paper towels.
  + The support for the stretcher will be placed to the left side of the patient's compartment.
  + Attached oxygen cylinders will be placed in a well-defined place in the medical compartment in a zone which allows for them to be easily changed.
  + The mobile oxygen cylinder will have a special place for attachment, designed inside the medical compartment, and will be foreseen with its own carrying bag.
  + The patient transport chair will be installed in the back part, which is easily accessible.
  + The floor will be chosen so that it provides an adequate adhesion for the accompanying person, including when it is wet; it has to be resistant and easy to clean.
  + The interior part of the patient's compartment, fully equipped, will be designed so that it reduces to minimum the risk of injury.

**5.2 Dimensions of the patient's compartment**

* + Minimum length: 3000 mm, at the level of the stretcher from which it is excluded the length of any cupboards, drawers and other furniture placed near the partition wall.
  + Minimum height: 1750 mm, in the stretcher working zone.
  + Minimum width:
* Total, including cupboards- minimum1600 mm.;
* The minimum width of the useful surface - minimum 1400mm (according to EN 1789).

**5.3 Number of places for the accompanying people:**

* + Minimum number of places: 2
    - The position to the right side of the stretcher, at the upper half: 1
    - The position to the stretcher's head: 1.
  + The seat installed towards the travel direction will be equipped with a seatbelt in 3 points integrated into a swivel chair at 180°C and having a headrest, and the seat installed opposite the direction of travel has a seatbelt in 2 points and a headrest.
* The sitting place:
  + Height: minimum 400 mm from the floor;
  + Height: maximum 500 mm from the floor;
  + Width: at least 450 mm;
  + Depth: at least 400 mm;
* For the back:
  + Height: minimum 450 mm from the sitting place;
  + Width: at least 450 mm.

**5.4 Ventilation system:**

* + A ventilation system will be available, which would ensure a minimum of 20 replacements per hour of the air volume in/from the patient’s compartment.

**5.5 Heating and cooling systems:**

* + In addition to the heating of driver's cabin, an adjustable, independent system, to heat the air will be available. The system will consists of 2 separated subsystems:
    - Independent heating aggregate, operable when the engine is on or off.
    - Heating electric radiator, functional when the ambulance is stationary and connected to a plug of 220 V.
  + They will be foreseen with thermostats so that the temperature fluctuations do not exceed ± 5ºC.
  + The system configuration will prevent the entry of exhaust gas in the patient's compartment.
  + Besides the heating system there will be available an air-cooling system (air conditioning) which will serve the patient's compartment separately.
  + Heating system for the patient’s compartment:
* Autonomous heating system in the medical compartment of the vehicle.
* The possibility to reach the necessary temperature in 15 min.
* To create a temperature of 22°С at the middle of the stretcher in no more than 30 min.
* A thermostat to maintain the temperature with ±5°С must be available.

**5.6 Interior lighting**

* + Lighting of the patient's compartment (light of balanced, natural colour) of LED type:
    - Patient’s zone: minim 300 lx (adjustable);
    - Surrounding zones: minim 50 lx.

**5.7 The level of inside noise**

* + Depending on the running speed, the level of inside noise will be according to the European regulations in place (according to EN 1789).

**5.8 Perfusion support system**

* A folding support for perfusion, mounted on the ceiling, will be equipped so that it is able to support two-three perfusions attached vertically and able to avoid their balance. The support should make maximum use of the vehicle’s height above the stretcher.
  + The support system will have a minimum capacity of 5 kg and will be able to support three bags with liquid, independent one from the other (according to EN 1789).
  + On the left lateral wall in the proximity of electricity and oxygen sockets there will be installed the bar with a length which is sufficient for mounting the necessary devices.

**5.9 Systems for maintaining/attaching the equipment in the patient's compartment (EN 1789 and subsequent amendments)**

* + Without exception, all persons and materials such as medical devices, the equipment and objects which normally are in an ambulance must be attached so that they do not become a projectile when being subjected to a force of 10g (gravitation) horizontally (front, rear and transverse) and vertically.
  + The distance covered by the people or the materials when they are subjected to such forces does not have to endanger the safety of persons in the ambulance.
  + If they are subjected to these forces, then:
    - no object will have sharp edges which would endanger the safety of persons in the ambulance;
    - the maximum distance of movement of the stretcher or any other attached component and of the fixing system will not exceed 150 mm.

**6. MEDICAL DEVICES AND EQUIPMENT**

**6.1 Endowment with medical devices**

The ambulance will be designed and built so that it ensures:

* assisted transport in conditions of maximum safety for the patient and the personnel;
* storage and attachment of medical devices both those in service as well as the packed ones;
* technical conditions necessary for the utilisation of the available equipment.

**6.2 Medical equipment storage**

* + All equipment necessary for standard procedures will need to be stored in a place specially designed for this purpose.
  + The essential equipment necessary for an intervention outside the vehicle must be easily accessible through the ambulance's doors.
  + All equipment will be safely stored using a fastening system to prevent knocking or injury while driving the vehicle.

**6.3 Requirements for medical devices**

**General requirements:**

* + The equipment will be designed for both to be used in conditions when the ambulance is in motion as well as to be used in the field.
  + If the equipment is designed as "portable" (exempt from the equipment for transporting the patient) it has to be able to:
    - be carried by a single person;

- have its own energy source and to be self sufficient, chargeable in the vehicle while the vehicle is in motion and when it is stationary.

* + - be used outside the vehicle, independently.
  + Temperature:
    - In the absence of other inscriptions on the device, it has to be able to operate within a temperature range of -5ºC and 40ºC.
    - In the absence of other inscriptions on the device, this has to be able to operate minimum 20 min. when being placed at a temperature of –5oC, after it had been stored at a temperature of 20oC.
  + Attaching the equipment:
    - It will be attached inside the vehicle.
    - The fastening system has to resist to accelerations of 10g on the longitudinal, transverse and vertical axis.
    - Electrical terminals and sockets will not be part of the fastening system of the equipment.
  + Electrical security:
    - All the equipment has to be selected and installed so that it does not cause damage to the equipment supplying electricity.
  + Interface with the user:
    - buttons, switches, indicators and control panels have to be easily accessible. The units of measurement in SI (except from blood pressure and airways pressure) and standardized graphical symbols will be applied where necessary.
  + Maintenance:
    - The manufacturer will provide user and maintenance guides in Romanian and Russian.

**7. LIST OF EQUIPMENT**

**7.1 The equipment for handling and immobilizing the patient:**

* Support stretcher/fastening system for the stretcher during transportation placed laterally or in the middle with sliding system.
* The main stretcher with wheels, with an fastening system for the patient should meet the following criteria:
* Length 1950mm ±20 mm.
* Width 550±20 mm.
* Wheel diameter minimum 20mm.
* To follow the requirements of the standard EN 1865-1:2010+A1:2015
* Composed of two removable parts: stretcher and trolley.
* Testing EN 1789 – the testing certificate has to be available.
* Self-loading system.
* Automatic release of the legs of the trolley when unloading from the ambulance.
* Height adjustable, minimum 3 positions.
* Position Trendelenburg and anti-Trendelenburg when the trolley is on its own wheels.
* Adult seatbelt system, including over the patient’s shoulders.
* Paediatric seatbelt system for new-borns and children.
* Folding support for infusions.
* Folding lateral handholds.
* Telescopic handholds for the transport of the stretcher.
* Wheel brakes.
* System for folding the legs in the anterior and posterior parts of the trolley.
* Manufactured from easy-to-maintain materials.
* The stretcher and the trolley will support a weight of up to 220 kg separately or combined, including when the equipment is on the wheels.
* Reusable mattress, made from resistant material which allows an easy wash and disinfection:
* Length 1950mm ±20 mm;
* Width minimum 550 mm±20 mm;
* Height maximum 100 mm;
* With minimum 6handholds and a system for fastening the patient;
* Other parameters according to the standard EN 1865.
  + Vacuum mattress - 2 pieces 1 adult/1 child:
* Includes pump and repair kit.
* The pump will have the capacity to reduce the pressure with 500 h/Pa during 4 minute.
* The minimum width for the vacuum mattress for the adult is 80 cm, for the paediatric one is minimum 45 cm.
* Handholds for carrying.
* Fastening straps for the patient.
* Other parameters according to the standard EN 1865.
* Wheel chair, with patient fastening system and brake system – the patient’s weight up to 150 kg. Four wheels, two wheels with brakes. Tested 10G fixation to ambulance wall. Backrest and leg support surfaces easy removable. Chair weight not more than 10 kg.
* Rigid adjustable stretcher of shovel type made of aluminium- 1 piece:
* With head immobilization system (divisible in 2 parts, together with the stretcher).
* Adjustable on its length in at least 3 steps for patients with different heights.
* Folding.
* Fastening straps for the patient.
  + Complete rigid stretcher for the spine with fastening system – 1 piece.
  + Head immobilizer for stretchers: made of plastic material, dense with large ear holes for monitoring the patient; impermeable material, easy to clean and disinfect.
  + Traction device for femoral fractures with a carrying bag.
  + Kit of splints for the immobilisation of upper, lower limbs and the basin:

Kit vacuum splints - 1 pieces.

Kit inflatable splints – 1 pieces.

Kit rigid splints – 1 pieces.

Each set includes pump, bag, repair kit.

* + Cervical collars adult/child– reusable device, used for precise cervical immobilization, must allow intubation, access to tracheotomy and safe medical manoeuvres. In total set of 6 pieces will be delivered: 4 adjustable for adults and 2 pieces adjustable paediatric with bag for carrying.
  + Extrication device of type KED - 1 piece.

**7.2 Equipment/devices for resuscitation - breathing (minimum requirements)**

* + Fastened oxygen installation:
    - Oxygen cylinders: minimum 2 pieces of 10 litters each.
    - Pressure reducers endowed with manometers for each cylinder.
    - Minimum 2 standard fast connections DIN for respiratory assistance devices, attached on the left lateral wall.
    - Flow meter with a maximum capacity of at least15 l/min., adjusting valve, humidifier, tubing and facial mask.
    - 1 reserve cylinder of 5 litters mounted on the stretcher, with a bag for carrying and a reducer.
  + Portable oxygen:
    - 1 cylinder of 5 litters with place for attachment in the ambulance, with fixing system on main stretcher, endowed with a bag for protection and transport.
    - Pressure reducer with a flow meter with a maximum capacity of at least 15 l/min., adjusting valve, humidifier, tubing and facial mask, and fast connection for the ventilator integrated into the reducer.
* Ventilation balloon of type Ambu: adult, child, new born – 3 pieces (1 piece for adult + 1 piece for child + 1 piece for new born), with a double wall, 100% latex free material, in a kit with 5 masks (in total: adult – 2, child -2, new born -1):
  + - Pressure limiting system for preventing overpressure.
    - Ventilation balloon for the newborn has to be self-inflating with a capacity of 250-700 ml and to ensure minimum 15-25 ml for each ventilation.
* Forceps Magill of various sizes for adult/child - 2 pieces.
* Kit for des-obstruction of respiratory tract - 1 pieces (1 mouth opener, 1 tongue depressor).
* Device for mouth insufflation with a mask with bacterial filter, with unique sense valve, in a box for carrying – 1 pieces.
* Electrical battery operated aspirators - 2 pieces:
  + - One attached through the bracket to the ambulance’s wall according to EN 1789;
    - One portable, endowed with a bag for carrying;
    - resistant to drops, blows, water and disinfectants;
    - with a vacuum regulator incorporated;
    - robust, portable, compact;
    - electrical operation with a battery incorporated;
    - Continuous mode of operation, based on the battery built-in or connected to the power supply; Battery operating time at least 60 min.
    - energy supply 220V, 12V with adapter;
    - Free air suction flow 30L/min the maximum pressure will be minimum 600 mmHg;
    - the minimum capacity of the reservoir is 1 L, reusable;
    - alarm and monitoring system for the battery status and connection to the power supply;
    - it is delivered in a kit with connection cable at 12 V, with minimum 2 reusable silicone tubes of 1,5-2 m in length. Antibacterial filters minimum 5 pieces. Set of Yankauer suction probes – 2 pieces.

**7.3 Equipment for monitoring/defibrillation/diagnosis**

* **Automatic defibrillator with monitor:**

General considerations:

* Automatic defibrillator with monitor, robust construction with easy to clean surfaces, easy to manipulate, use and carry;
* Equipped with alarm systems minimum for:
* electrodes detachment;
* asystole;
* tachycardia;
* bradycardia;
* fibrillation;
* with digital adjusting systems for alarm levels.
* Impermeable bag with inside compartments and adjustable strap.
* Vibration according to EN 1789.
* Resistant to the impact EN 1789.

Delivered configuration:

* Defibrillator with Li Ion battery.
* Kit of reusable paddles, including adult/paediatric paddles – 1 set.
* Kit of single use paddles for adult – 5 pieces and paediatric paddles – 2 pieces, including adapter for single use paddles.
* Kit of cables ECG 5 Derivations.
* Kit of cable and reusable SpO2 adult – 1 set and paediatric sensor – 1 set.
* AED module.
* SpO2 module.
* Data transmission module poor equivalent.
* 1 Kit of electrodes ECG of single use – 100 pieces.
* Built-in thermal printer.
* Roll printer paper 5 pieces.
* Cable with power supply at the network and at 12 V.
* Power supply cable 12 V with connector.
* Card SD 2 Gb minim.
* Dedicated carrying bag.

Technical description:

* to possess a built-in display monitor, HD colour of minimum 7 inches;
* to allow the display and supervision: ECG route, AED mode, SpO2 values, battery status, alarm status, day, date, counting and recording of each shock;
* to possess a fast access and safe menu for options and the shock energy;
* to possess one terminal designed for testing the functionality of paddles;
* to possess in-built Li-Ion rechargeable battery;
* the battery has to provide sufficient power for the administration of minimum 150 shocks of 200J per one charge or not less than 4 hours of ECG continuous monitoring;
* the battery life-time is minimum 4 years;
* recharging time is maximum 4 hours;
* to possess sound and visual alarm systems regarding the battery discharge;
* the system will be able to work both with reusable paddles as well as with paddles of single use, the paddles must be interchangeable;
* the system has to recognise automatically the paddles type;
* the system has to recognise and display on the screen the correct position of paddles on the chest;
* the system has to provide options for: AED included , SpO2 included, incorporated Wi-Fi or Bluetooth module.
* the printing will be automatic or manual on 1 channel;
* the width of the paper is 48 mm or other standard dimensions;
* the printing speed is 25,50 mm/sec.

ECG monitoring:

* 5 channel derivatives;
* the catch of ECG signal to be done through the defibrillation paddles, single use electrodes or reusable electrodes;
* recognition of the peacemaker has to be automatic;
* heart frequency range from 30 to 300 bpm;
* to possess alarm systems for: electrode detachment, asystole, tachycardia, bradycardia, fibrillation;
* recording: internal memory of 2 GB minimum.

Technical parameters of defibrillation:

* Defibrillation – of type BTE (biphasic truncated exponential waveform);
* Shock energy – automatically selected in a standard way from 2 to 200J;
* Recharging time for repeated shock administration maximum 8 seconds;
* Synchronous discharge for cardioversion;
* Automatic system to limit the power to 50J in case when the system recognises the paediatric paddles;
* Automatic cancellation and shock discharge system up to 30 seconds of non-use period.

Other technical characteristics

* Monitor: HD colour, 7 inches, allows the display: ECG, AED, SpO2 mode, battery status, alarms, date and time, automatic counting of shocks.
* Automatic evaluation of ECG.

To allow the subsequent installation of the modules and the accessories:

* SpO2 mode, included l measuring range 1-100% (resolution minimum 3), cu Pulse Rate 20-250 BPM (resolution minimum 3 bpm), including reusable SpO2 adult and paediatric sensor.
* Incorporated Wi-Fi or Bluetooth module with the possibility of later installation of the equipment software for integration into remote data transmission system, compatible with Moldavian standards.
* **ECG device:**
* In-built LCD screen, dimensions which allow facial visualization of those minimum 3ECG waves.
* Multiple linguistic support, minimum 2 (Romanian and Russian).
* Preview of ECG waves, auto-diagnostic and the possibility of result printing.
* To possess a software compatible with the PC.
* The doctor has to be able to visualise the ECG wave sent from the ambulance on PC station from the stationary.
* USB flash disk – for recording data and back-up;
* Recording calibration system.
* Pacemaker detection and protection to the defibrillator shock.
* Functions for Auto Measure and Auto Diagnosis.
* Simultaneous acquisition on 12 channels, amplification and recording.
* Built-in thermal printer.
* ECG wave editing, gain, recording speed, patient information measurement report.
* AC and DC power supply, Lithium-Ion rechargeable in-built battery minimum 2 hours of continuous functioning on the battery-charging mode, cables and connectors included.
* Internal memory for300 waves ECG.
* 2G SD card in-built which allows the recording of over 10000 waves ECG.
* Available on line upgrade software.
* Automatic measurement and interpretation, automatic testing, verification of the acquisition channels format3×4, 3×4+1R, 3×4+3R, 6×2, 6×2+1R, 12×1, 12×1+T.
* Automatic analyse and detection of 122 types of arrhythmias.
* Selectable working modes: manual/auto/ depending of the rhythm.
* Graph showing status connections and electrodes – indicates the connection error of cables or placing / detaching the measuring electrode.
* High precision digital filters;
* Network socket and Wi-Fi mode– allows sending online in real time of the ECG waves.
* ECG acquisition channels: Standard 3, 6, 12 channels,
* Accuracy ±2%.
* Calibration Voltage - 1mV ± 1%.
* Input Impedance 50MΩ.
* Circuit Input Current< 50nA.
* Stabilization of reference base – Automatic.
* External Input/Output:
* Input ≥100 KΩ sensitivity10mm/V ±5%;
* Output: ≤100Ω, sensitivity 1V/mV ±5%;
* Recording speed: 25mm/s, 50mm/s
* Roll printer paper
* Accessories: 1 x supply cable, 1 x patient cable, 6 x Reusable chest electrodes of pear type, 4 x Reusable extremity electrodes, clips type, minimum 5 x paper rolls, 1 x grounding cable, 2 x fuses.
* PC connection cable.
* AC and DC supply cable.
* User guide in Romanian/Russian.
* Dedicated carrying bag.
* **Portable Pulse Oximeter, adult and children to be used in the ambulance**

Description:

* device which measures non-invasively the oxygen concentration in the blood and heart rhythm by using the photometric method;
* the heart rhythm is calculated automatically and displayed based on the performed measurements;
* the pulse oxymeter has to give a high reading precision regardless of the patient’s type, the skin’s condition, even in conditions of repetitive movements of the arm on which the sensor in mounted or regardless a low perfusion’s flow.

Parameters:

* Compact, portable device, which will be used in the emergency/ambulance service.
* Carcase resistant to falls, strokes, shock, scratches: IPX minimum 2 or more.
* Possibility to be attached in the ambulance, attachment mechanism included.
* Battery, minimum 10 hours.
* Visual and audio alarms.
* Memory of minimum 72 hours.
* Audio signal, sensor off, slipping sensor and sensor for battery discharge.
* Alarm limits settings.
* Total recording time in the memory 72 hours.
* Supply from the battery 3 /battery of type ,,AA/AAA” rechargeable and accumulators with a lifetime of the battery of minimum 60 hours.
* Weight maximum 200 g (without batteries).
* Operation temperature 0…+50 0C.
* Relative humidity of 15…90%.

Patient type:

* adult
* paediatric,
* new born

Sensor SpO2:

* reusable separately, with the possibility of automatic replacement and recognition;
* Fitted for utilisation both with reusable sensors as well as with single use sensors.

Displays:

* LSD or TFT screen, colour minimum 2,8 inches.
* Pulse value – yes.
* SpO2 wave – yes.
* Signal power – yes.
* Battery level – yes.
* Error message – yes.

SpO2 criteria. Oxygen saturation (Sp02)

**-** Measurement area 70…..100%.

- Measurement precision ±2%.

- Heart rhythm (HR).

- Measurement interval 30…..235 beats/min.

- Measurement stage 1 beats/min.

- Measurement precision ±2.

- Bar Pulse (bar graph).

Alarms

* Audio and visual.
* SpO2, high level SpO2, low level.
* Pulse, high level, Pulse, low level.
* Disconnected sensor.
* Discharge battery.
* Alarm stop.

To possess the following functions:

* Manual or automatic reactivation method.
* Volume control.
* Self-testing.

Internal memory, minimum 72 recording hours.

Supply

* Internal battery – yes.
* Rechargeable type AA / AAA – yes.
* Battery autonomy ≥ 8 hours.

Accessories and consumables

**•** SpO2 reusable sensor, Adult - 1 piece.

• SpO2 reusable sensor, Paediatric - 1 piece.

• User guide (in Romanian and Russian).

• Technical or maintenance guide. Preferably in Romanian.

* **Digital thermometer with a resolution within 28-42°C:**

Technical description:

* the digital thermometer reads the infrared radiation from the surface of the skin for an accurate calculation of the body temperature touch less;
* never enter into contact with the patient’s skin, in order to avoid any contamination risk;
* non-invasive: does not require cooperation with patient, recommended for children;
* precise: an advanced microprocessor to ensure a high measure precision;
* economic: does not require expensive tests;
* Fast results, in just a few seconds.

Technical specifications:

* Measuring limits at the forehead: 34.0/42.5°C;
* Measuring limits (outside the forehead): 1.0/55.0°C;
* Working environment temperature: 16/40°;
* Precision: 0.1°C.
* Accuracy level according: +/-0.2°C +/-0.3°C.
* Operation distance: 3 cm (1.2 inches) determined by the optic signal.
* Batteries: minimum 2 x AA/AAA (1.5V) included, an equivalent of the same capacity is accepted.
* Weight: not higher than 100 gr.
* **Automatic electric syringe** with in-built battery; included administration mode, volume, weight, medication library.

Delivered configuration:

* Electric syringe pump;
* Li Ion in-built rechargeable battery;
* Bar fixing mechanism;
* Mode and software automatic recognition of syringe;
* Supply cable AC - 1 piece;
* Supply cable, source from ambulance - 1 piece;
* Kit of syringes for starting and calibration;
* User guide (in Romanian and Russian);
* Technical or maintenance guide. Preferably in Romanian.

Technical description:

* digital double control for a maximum precision and safety;
* compatible with syringes of 10, 20, 50/60, with automatic recognition of syringes; to be able to function with syringes of various brands;
* to be able to calculate automatically the debit after the introduction of the infused volume and the administration time;
* to allow the administration of the infusion in bolus at request, with a preselected volume and a precision of minimum +/-2%;
* to possess a software, calculation of dosage included;
* to possess a medication library;
* Infusion speed set 0.01 -200 ml /hour.

Monitoring system for:

* accumulator status;
* connection to the main power source 220 V;
* occlusion pressure level;
* administration profile;
* preselected time;
* functioning state;
* unit of measurement for dosage/flow;
* infused volume;
* the remaining time.

Alarm system:

* alarm for exceeding the pressure preset by the occlusion;
* alarm for incorrect delivery;
* device malfunction;
* when the alarm is triggered, the injector will automatically stop.
* **Volumetric manual automatic pump**

Description:

* pump – automatic, manual, sterile, portable, of single use;
* to ensure maximum stability and precision of the administration flow;
* flow schedule selectable within the area 2 - 12 ml;
* balloon volume minimum 300 ml;
* administration time up to 150 hours depending on the set flow and the loaded volume;
* multi-flow regulator included;
* to display the volumetric scale of residual volume;
* residual volume maximum 30 ml;
* to possess a special filter for air bubbles removal, with pores of 0.2 micron and the ventilation surface of minimum 1.65 cm square;
* to possess free port connection tip luer;
* to be suitable for connection to devices of type PCA (patient controlled analgesia);
* to be made of non-toxic and non-pyrogenic materials;
* to possess a carrying bag and weighing system.
* **Heating system for infusion solutions:**
* Portable heating system for infusion solutions with supply at 12 V.
* Allows the heating of minimum 3 solution bags of 1 l each or 6 bags of 0.5 l each.
* A carrying bag, thermally isolated, with shoulder strap has to be included.
* The thermal isolation is efficient for 2 hours from its disconnection from the power supply.
  + **Stethoscope** with the following configuration:

- Double capsule.

- Double way.

- Tube’s length: 45-65 cm.

- Diaphragm diameter: 35-45 mm.

- Delivered with a set of reserve accessories:

- 2 membranes;

- 2 pavilions for auscultation;

- 2 olive sets.

* + **Manual tensiometer** with minimum 5 cuffs (3 adult+2 child).
  + **Lamp for examining** **the pupils with battery.**
  + **Reflex hammer.**
  + **Infusion mounting system.**

**7.4 Sanitary materials (minimum requirements):**

• Kit of oropharyngeal pipes adult/children – 1 pieces.

• Laryngeal mask (adult, child) of type I-gel - 2 pieces each.

• Minitraheostomy kit - 1 pieces.

* Simple blankets – 2 pieces.

• Patient transfer sheet/mattress with handles and made of washable material - 2 pieces.

• Kit for amputated limbs + container for replanting with maintaining an internal temperature of 4+/-2°C, for at least 2 hours;

* + Manual tourniquet system – 1 piece. It has to be easy, portable, to be endowed with a manual pump with manometer in a set with a reusable cuff for adult – 1 pieces., and cuff for child – 1 pieces, with a connection tube of minimum 1m (in length), with bag.
* **Bag for portable equipment** made of impermeable textile, easy to clean, with reflective strips, foreseen with a spacious compartment divided by removable separators via a zipper system. On the exterior it has 2 lateral and one frontal pockets, the handholds secured with pad and a shoulder strap with pad adjustable.

Composition:

­ Balloon type AMBU (1 adult, 1 child) with 5 masks (3 adult, 2 children);

­ Kit of oropharyngeal pipes, minimum 5 sizes;

- Laryngeal mask (adult, child) of type I-gel - 2 pieces each.

­ Magill forceps, 2 sizes;

­ Mechanical manual vacuum, 1 piece;

­ Sphygmomanometer / stethoscope, 1 piece;

­ Reflex hammer, 1 piece;

­ Rechargeable oxygen cylinder 1 liter, device made of steel and a reducer made of bronze -1 piece.

The kits mentioned above will be attached in that place where they will be easily accessible, but without affecting the working space around the patient. Eventually, they will be attached to the back of the chair to the right or under the left lateral wall towards the back door. Their location will be discussed with the beneficiary before the final execution of attachment works in the patient’s compartment.

In the ambulance of type B there will be available two kits of equipment for resuscitation and management of respiratory ways, one kit in the bag and one in the car, in the drawers or the cupboard, immediately accessible without opening the bag.

The consumables for the devices in the ambulance will be delivered as follows: 1 kit for multiple use and single use for at least 25 patients, from each consumable such as defibrillation / racing electrodes, ECG electrodes for monitoring.

**7.5 Auxiliary materials and devices:**

* + Safety belts cutting device– 1 piece.
  + Medical scissors of type „safety boy” – 1 piece.
  + Reflective triangle- 2 pieces.
  + Mobile projector – 1 piece, able to connect at 12 V in the driver’s cabin in the back of the ambulance.
  + Rechargeable portable lantern - 1 piece.
  + Hammer to break the window from the patient’s cabin, if necessary.
  + Extinguisher - 2 pieces.
  + Rubber mats in the driver’s cabin.

**8. GUARANTEE**

All the equipment must to have at least 24 months guaranteed from moment of the signing the receiving minutes. The vehicle has to have a minimum guarantee of 200.000 km or 24 months whatever will be first achieved

**9. SERVICE AND MAINTENANCE**

Tenderers are obliged to deliver a single self-ambulance for checking equipment, placing equipment and bars in the patient compartment self-ambulance under conditions agreed for the beneficiary.

All bidders will probe the existence of technical facilities necessary for the service both for ambulances as well as for medical equipment according to the general guarantee conditions and the user guide of the manufacturer.

Maximum time for technical intervention – 48 hours.

Maximum time for remedial measures, in total 72 hours.

The technical service and current repair will be performed without waiting in a queue. The economic agent, winner, will ensure technical service and maintenance of ambulances on the entire territory of the country, including zonal – North, South and Centre – ensuring remedial measures (repair) up to 14 calendar days, regardless of the repair(s) type.

Temporary replacement of the equipment has to be ensured according to the periods mentioned above.

During the guarantee period, at the reasonable request of the user, repair, adjustments and maintenance of medical equipment and the vehicles, according to the specifications in the manufacturers’ guides, will be done free of charge. The spare parts and workmanship are for free, except from the consumables for vehicles established by the manufacturer.

**10. AVAILABILITY OF SPARE PARTS**

Each bidder takes under his own responsibility that will ensure the availability of spare parts, accessories and consumables for all offered positions on the market of the Republic of Moldova for at least 10 years from putting into operation, free of charge or against payment, as follows: spare parts free of charge, including the workmanship for the guarantee period, for the rest of the period – against payment for at least 10 years period is fulfilled.

The bidder will submit the pricelist for the spare parts and the maintenance program to the Ministry of Health, Labour and Social Protection as beneficiary.

Accessories and consumables for a 10-year period against payment: the bidder will submit a pricelist for the accessories and consumables necessary for the subsequent use to the Ministry of Health, Labour and Social Protection as beneficiary.

**11. GUIDES**

It is necessary to be a Technical Guide and User Guide. All guides will be available in Romanian and Russian.

**12. TRAINING**

The bidder will ensure the training of the technical and medical staff for the ambulances (vehicle and equipment) at delivery and will developed theoretical and practical training for professional staff part of the Ambulances’ medical team for good knowledge and skills.

**13. MATRICULATION**

The seller will offer to the buyer the entire set of documents and acts necessary for the matriculation of the vehicle at the Public Services Agency of the Republic of Moldova.

**14. DELIVERY**

The ambulance will be delivered in CPT conditions, according to INCOTERMS 2013.

The ambulance will be delivered under the form of functional unity (fully equipped ambulance), by specifying in detail the equipment and devices, which it has, given according to the giving/receiving act.

The winner, until the beginning of ambulances’ delivery, will organize a trip for a team of specialists of the contracting authority, in a number of 3-4 people (the working group), for the presentation of a sample of the ambulance assembled and equipped to verify its compliance with the terms of reference.

The cost of the offer includes: the devices, packing and transportation to the beneficiary’s premises, installation and putting into operation, training of technical, exploitation and maintenance staff, training of the medical staff.

The cost of consumables, spare parts and the workmanship, periodical maintenance interventions during the guarantee period are according to the terms of reference.

**15.** When presenting the offers, the bidders will submit a catalogue with color photos and/or sketches, which reproduce the configuration requested in the terms of reference.

**16.** The requirements in the terms of reference (technical specification) are considered mandatory**.**