

LIMITED LIABILITY COMPANY

«Double U Expo»

CEO

LLC «Double U Expo»

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«\_\_\_\_\_» \_\_\_\_\_ 2023

## RoboShow

Pavilion with a humanoid robot for entertaining interactive  
shows

User Manual

2023

**Dear User!**

We would like to thank you for choosing and purchasing an innovative product that is highly reliable and efficient in operation. We are sure that our product will serve you for many years.

Please note that the efficient and safe operation as well as proper maintenance are possible only after you have carefully studied this User Manual.

When receiving the product, we recommend you to check the scope of delivery and the absence of visible damage that may have occurred during shipping.

We wish you a pleasant experience!

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## Terms and Definitions

**The interaction mode** — the state of the robot when a person is talking to it, or when a person is using the display. It is the opposite of **standby mode**.

**The standby mode** — the state of the robot when it is not interacting with a person, i.e. when the robot is waiting for a question, phrase or screen touches from a person. It is the opposite of the **interaction mode**.

**A replica** — a phrase that the robot says.

# 1. General

## 1.1. Purpose

RoboShow, a pavilion with a humanoid robot for entertaining interactive shows (further on in this document — pavilion, product, device) is a set of audiovisual equipment that expands the functionality of the Humanoid Robot in the field of interactive entertainment of the user.

The RoboShow pavilion is designed to be installed on concerts, performances, presentations, shows and other mass entertainment events.

A Humanoid Robot is a robot with the appearance and facial expressions of a human. The robot recognizes human speech, verbally answers questions, communicates with people within a given subject area. The robot recognizes faces and can save the received data about a person using the "acquaintance" function. During communication, the robot gesticulates with its hands, expresses emotions on its face and imitates human facial expressions.

## 1.2. Technical Characteristics

Table 1. Technical Characteristics of the Pavilion

| №            | Parameter, unit of measurement                     | Value                  |               |
|--------------|--|------------------------|---------------|
| <b>Basic</b> |  |                        |               |
| 1            | Pavilion dimensions (HxWxL), m                     | 3.5 x 2.0 x 2.0        |               |
| 2            | Pavilion weight (max), kg                          | 650                    |               |
| 3            | Pavilion weight with packing (max), kg             | 1290                   |               |
| 4            | Transport case for LED panels                      | Quantity, pcs          | 3             |
| 5            |  | Dimensions (HxWxL), cm | 59 x 55 x 97  |
| 6            |  | Weight, kg             | 251.5         |
| 7            | Transport case for sound equipment and commutation | Quantity, pcs          | 1             |
| 8            |  | Dimensions (HxWxL), cm | 61 x 80 x 120 |
| 9            |  | Weight, kg             | 143           |
| 10           | Transport case for rotating spotlights             | Quantity, pcs          | 2             |
| 11           |  | Dimensions (HxWxL), cm | 42 x 38 x 55  |

|                           |  |                        |                |
|---------------------------|--|------------------------|----------------|
| 12                        |  | Weight, kg             | 62.8           |
| 13                        | Transport case for touchscreen display   | Quantity, pcs          | 1              |
| 14                        |  | Dimensions (HxWxL), cm | 102 x 80 x 144 |
| 15                        |  | Weight, kg             | 94.8           |
| 16                        | Transport case for other equipment   | Quantity, pcs          | 1              |
| 17                        |  | Dimensions (HxWxL), cm | 61 x 80 x 120  |
| 18                        |  | Weight, kg             | 145            |
| 19                        | Other packages with pavilion parts   | Quantity, pcs          | 15             |
| 20                        |  | Weight, kg             | 587.6          |
| 21                        | Frame material   |                        | Aluminum       |
| 22                        | Stage surface  | Material               | Plywood        |
| 23                        |  | Load, kg/m2            | 750            |
| 24                        |  | Anti-slip coating      | Yes            |
| 25                        |  | Color                  | Black          |
| 26                        |  | Height above floor, cm | 25             |
| 27                        | Rotating podium for the robot  | Material               | Metal          |
| 28                        |  | Load (max), kg         | 90             |
| 29                        |  | Diameter, cm           | 80             |
| 30                        |  | Color                  | Black          |
| 31                        |  | Rotation, °            | 360            |
| 32                        | Input voltage, V   |                        | 380            |
| 33                        | Rated current, A   |                        | 32             |
| 34                        | Max Power Consumption, kW  |                        | 7              |
| <b>Lighting equipment</b> |  |                        |                |
| 35                        | Rotating spotlights  | Quantity, pcs          | 8              |
| 36                        |  | Power, W               | 150            |
| 37                        | Laser projector (RGB)  | Power, W               | 2              |
| 38                        | Color LED strip around the pavilion, touchscreen display and rotating podium for the robot |                        | Yes            |
| <b>Sound equipment</b>    |  |                        |                |
| 39                        | Subwoofer  | Quantity, pcs          | 1              |
| 40                        |  | Power, W               | 600            |

|                                  |                |                                   |        |
|----------------------------------|----------------|-----------------------------------|--------|
| 41                               | Speakers       | Quantity, pcs                     | 2      |
| 42                               |                | Power, W                          | 400    |
| 43                               | Mixing console | Number of devices to connect, pcs | 10     |
| 44                               |                | Control via Wi-Fi                 | Yes    |
| 45                               | Microphone     | Appearance                        | Retro  |
| 46                               |                | Rack height (adjustable), cm      | 95–155 |
| 47                               |                | Cable length, cm                  | 100    |
| <b>Information equipment</b>     |                |                                   |        |
| 48                               | LED panels     | Quantity, pcs                     | 4      |
| 49                               |                | Vertical dimension, cm            | 50     |
| 50                               | Display        | Touchscreen                       | Yes    |
| 51                               |                | Diagonal, "                       | 32     |
| <b>Special effects equipment</b> |                |                                   |        |
| 52                               | Fog machine    | Power, W                          | 300    |

Table 2. Technical Characteristics of the Humanoid Robot

| №            | Parameter, unit of measurement                      | Value              |  |
|--------------|---|--------------------|--|
| <b>Basic</b> |   |                    |  |
| 1            | Robot dimensions (HxWxL), mm                        | 1900 x 900 x 500   |  |
| 2            | Transport case dimensions (HxWxL), mm               | 1640 x 1010 x 1000 |  |
| 3            | Robot weight (max), kg                              | 88                 |  |
| 4            | Robot weight including the transport case (max), kg | 160                |  |
| 5            | Input voltage, V                                    | 110–220            |  |
| 6            | Frequency, Hz                                       | 50–60              |  |
| 7            | Max Power Consumption, W                            | 700                |  |
| 8            | Material  | Frame              | Aluminium, steel, plastic                        |
| 9            |   | Skin               | Silicone   |
| 10           |   | Arms               | Aluminium, steel, plastic, electronic components |
| 11           |   | Legs               | Plastic  |

| <b>Movement</b>  |  |                                |                                      |
|------------------|--|--------------------------------|--------------------------------------|
| 12               | Number of degrees of freedom                 | Head                           | 3                                    |
| 13               |  | Arms                           | 12                                   |
| 14               |  | Torso                          | 3                                    |
| 15               | Number of servos                             | Head                           | 19                                   |
| 16               |  | Neck                           | 3                                    |
| 17               |  | Torso                          | 3                                    |
| 18               |  | Arms                           | 13*2                                 |
| 19               | Number of points of articulation in the face |                                | 18                                   |
| 20               | Amplitude of eye movement                    |                                | Blinking                             |
| 21               |  |                                | Movement up and down, left and right |
| <b>Equipment</b> |  |                                |                                      |
| 22               | Camera                                       | Resolution                     | 1920 x 1080                          |
| 23               |  | Frame rate, fps                | До 30                                |
| 24               |  | RGB lighting around the camera | Есть                                 |
| 25               | Microphone                                   | Omnidirectional                | Есть                                 |
| 26               | Speakers                                     | Quantity, pcs                  | 2                                    |
| 27               |  | Power, W                       | 25                                   |

### 1.3. Package Contents

When unpacking the product, check that all of the following components are included (Table. 3).

When receiving the product, check completeness of its package contents and the absence of visible damage that may have occurred during shipping or improper storage in the seller's warehouse. In case of defects, please contact the manufacturer.

Table3. Package Contents

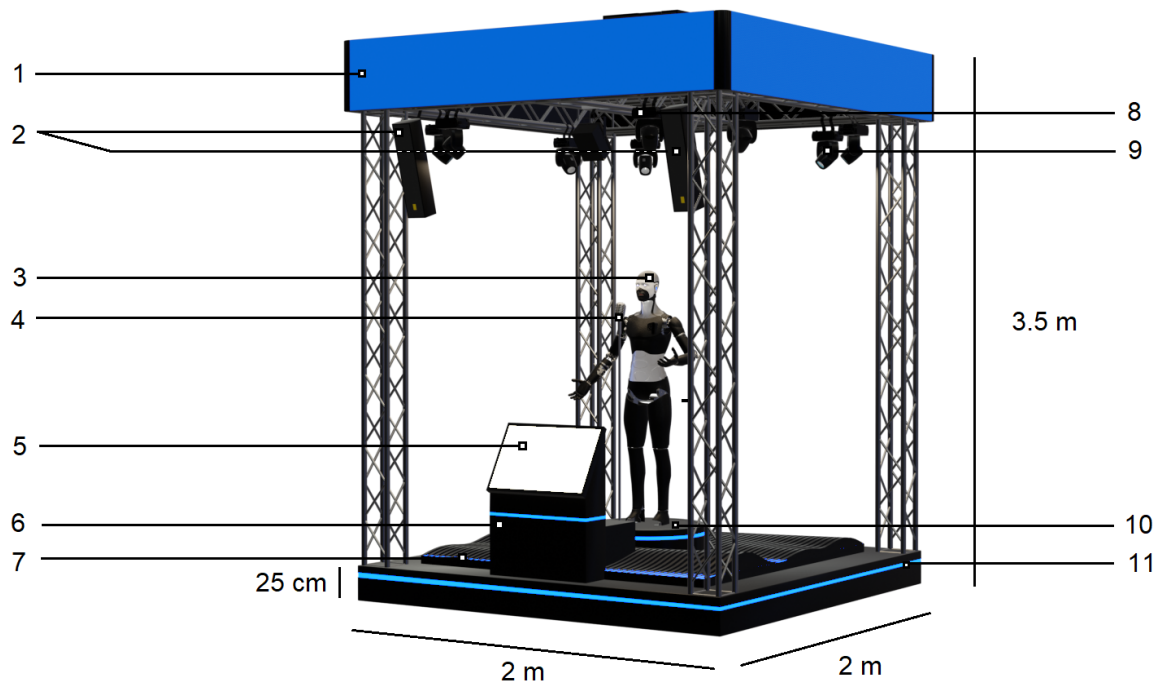
| <b>№</b> | <b>Name</b> | <b>Quantity</b> |
|----------|-------------|-----------------|
|----------|-------------|-----------------|



|    |  |        |
|----|--|--------|
| 1  | A set of aluminum frame structures (trusses)             | 1 pc   |
| 2  | A set of connecting elements for frame structures        | 1 pc   |
| 3  | Stage surface panel set                                  | 1 pc   |
| 4  | Set of connecting elements for the stage surface         | 1 pc   |
| 5  | A set of stands for the stage surface                    | 1 pc   |
| 6  | A set of panels with LED strip                           | 1 pc   |
| 7  | Rotating podium for the robot                            | 1 pc   |
| 8  | Rotating spotlights                                      | 8 pcs  |
| 9  | Signal Converter (for rotating spotlights)               | 1 pc   |
| 10 | Laser projector (RGB)                                    | 1 pc   |
| 11 | Controller for laser projector                           | 1 pc   |
| 12 | Aluminum hook for light and sound equipment              | 21 pcs |
| 13 | Subwoofer  | 1 pc   |
| 14 | Speaker  | 2 pcs  |
| 15 | Mixing console   | 1 pc   |
| 16 | Microphone   | 1 pc   |
| 17 | Microphone stand   | 1 pc   |
| 18 | Microphone cable (XLR)                                   | 1 pc   |
| 19 | LED panels   | 4 pcs  |
| 20 | Touchscreen display                                      | 1 pc   |
| 21 | A set of commutation                                     | 1 pc   |
| 22 | Fog machine  | 1 pc   |
| 23 | Canister (5 l) with liquid for fog machine               | 1 pc   |
| 24 | Transport cases  | 9 pcs  |
| 25 | Humanoid Robot   | 1 pc   |
| 26 | Platform of Humanoid Robot                               | 1 pc   |
| 27 | A set of power cables and commutation for Humanoid Robot | 1 pc   |
| 28 | Set of fixing screws and keys for the Humanoid Robot     | 1 pc   |

## 2. Pavilion Components

This product consists of the following main components, shown in Figure 2.1.



*Figure 2.1. RoboShow pavilion*

1. LED panel (on each side of the pavilion)
2. Speakers
3. Humanoid Robot
4. Microphone
5. Touchscreen display
6. Subwoofer
7. Fog machine
8. Laser projector
9. Rotating spotlights (8 шт)
10. Rotating podium for the robot
11. Colorful LED strip

**Note:**

The manufacturer reserves the right to modify the product's construction, design, configuration or technology without prior notice in order to improve its performance.

### 3. Work Area Requirements

There are some special requirements for the room in which the product will be placed.

First of all, the work area should be a room, which means that the product is not designed for outdoor use, as it is a technologically complex electrical product that requires protection against moisture.

Secondly, the direct sunlight could damage parts of the robot's body and 'blind' the robot's cameras (interferes with the face recognition function).

And finally, the wind makes a lot of noise (interferes with the speech recognition function).

Also please consider that the robot needs a stable Internet connection for the speech recognition system to work.

Meeting these requirements will affect the efficiency and longevity of the robot's work.

The room or place where the product will be used should meet the following requirements:

1. air temperature from +10° to +35°C;
2. air humidity not more than 70%;
3. an average lighting level is 50 lux and more.

You should make sure that there are no such sources of disturbances next to the product:

1. high voltage;
2. bright blinding light (including directional spotlights);
3. loud noise or loud music.

The robot needs access to the Internet, so the following requirements apply to the room:

1. Availability of seamless Wi-Fi (802.11n) coverage with a frequency of 2.4 or 5.0 GHz with a guaranteed two-way transmission of at least 4 Mbps throughout the entire work area. Ping to the address 8.8.8.8 is no more than 50 milliseconds.

2. Radio transparency (absence of thick walls, large columns and obstacles) in the path of propagation of Wi-Fi waves from the access point to the robot.
3. Low level of interference on Wi-Fi frequencies (no other working access points and Wi-Fi routers of 802.11 ac standards indoors in the robot's work area).
4. Ports 80, 443, 8080, 22105, 22111 are open in the router settings.

When organizing access to the Internet, keep in mind that **the robot does not connect to hidden networks.**

## **4. Safety Precautions**

### **4.1. General Safety Rules**

1. Use the product only for its intended purpose as specified in the User Manual.
2. Place the product only in rooms that meet the requirements described in Chapter 3.
3. Do not use the product outdoors or in rooms with high humidity.
4. If the product was transported in sub-zero temperatures, be sure to let the robot stand powered-off in a heated room for at least two hours before turning it on.
5. Please read the User Manual before unpacking the product.
6. The robot's arms can cause an injury while the robot is operating, so do not touch the robot's arms while they are moving.

### **4.2. Electrical Safety Rules**

1. When operating the product, follow the general safety rules for the use of electrical appliances.
2. Before handing over for repair or storing the product, turn off its power.
3. The parameters of the mains should correspond to a voltage of 220V and a frequency of 50–60 Hz. Voltages above or below 220V could cause the product to malfunction.
4. Regularly inspect the power cable for damage and wearout. You should use the power cable only if it is completely undamaged.
5. If the power cable is damaged or ruptured, unplug it immediately from the electric outlet. Replace the power cable with a new one.
6. Do not pull the power cable from the electric outlet holding it on the cable, please hold it on the plug while pulling.
7. Do not step on the power cable.
8. The electric outlet should correspond exactly to the plug of the power cable.
9. It is recommended not to use adapters.
10. You should use only grounded electric outlets to connect the robot. Using ungrounded electric outlets could cause the robot to malfunction.
11. If you need to use an extension cable, then you should use only standard industrial ones. The cross section of the extension cables should not be smaller than the cross section of the power cable of the robot. If the length of the extension cable is 20 m and smaller, then use extension cables with a cross section of 1.5 mm<sup>2</sup> and more. If the length of the extension cable is from 20 to 50 m, then use extension cables with a cross section of 2.5 mm<sup>2</sup> and more.
12. When using an extension cable wound around a spool, pull the cable out to its full length.

13. If necessary, consult a qualified electrician.

#### **4.3. Safety Rules during the Display Cleaning**

1. Clean the robot's display only when the power is off.
2. It is recommended to use a soft cloth to clean the robot.
3. Use glass cleaner only. Do not use abrasives, benzene and carbon tetrachloride as these substances can damage the glass. Do not use isopropyl alcohol, because it may leave streaks on the glass.
4. Do not spray the glass cleaner directly on the glass, spray it on cloth. If too much cleaner is applied to the glass, the liquid may get past the edges of the glass or into any technological gaps and cause the robot damage.

## **5. Robot behavior in standby mode**

The robot has a list of special movements and replicas for the standby mode.

When there is no interaction with user, the robot perform some movement from special list, e.g., bend- unbend it's fingers or eyeing something, or says some replica to invite interaction.

Movements and replicas are played randomly.

The replicas are available in 4 languages.

## **6. Entertainment**

The user can choose entertainment from the following list:

1. About me
2. Interesting fact
3. Partner
4. Selfie
5. Poem
6. Riddle
7. Prediction
8. Song
9. Illusion
10. Congratulation
11. Phygital Engagement

### **6.1. About me**

The robot tells about itself and its abilities. The robot's speech is duplicated by the text on the screen. The robot gesticulates with its hands and expresses emotions on its face while interacting with user.

### **6.2. Interesting fact**

The robot tells a curious fact. The robot's speech is duplicated by the text on the screen. The robot gesticulates with its hands and expresses emotions on its face while interacting with user. If there are several replicas for this step in the Linguobase, then the replica is selected randomly.

### **6.3. Partner**

The robot tells about business partner. The robot's speech is duplicated by the text on the screen. The robot gesticulates with its hands and expresses emotions on its face while interacting with user.

### **6.4. Selfie**

All spotlights turn to provide the best possible lighting for the robot and the visitor while taking pictures. The robot takes a pose for a photo, the timer starts (10 seconds), during which the robot stays in a pose for a photo. Then the visitor can take a photo on their smartphone or wait for a photo from the robot's camera. The final photo from the robot is displayed on the screen. The visitor can enter their email address and email



the resulting photo to themselves. Each step of taking the photo is commented by the robot verbally.

List of robot poses for a photo:

- A pose for a photo on the front camera of the smartphone — the robot leans forward with its body and head, and makes a V gesture with its hands.
- A pose for a photo, when the robot turns sideways towards the user and extends its arm for a handshake.
- A pose for a photo, when the robot has its arms folded on the chest.
- A pose for a photo, when the robot leans its head to one side and spreads its arms to the sides.

## **6.5. Poem**

The robot tells a replica about poetry in general. The robot tells a poem. The robot gesticulates with its hands and expresses emotions on its face while interacting with user. At the end of the poem, the robot bows.

## **6.6. Riddle**

The robot suggests to choose a difficulty of the riddle: simple or difficult. After the user has chosen the difficulty, the robot reads out a riddle. The robot's speech is duplicated by the text on the screen.

Answer options are displayed on the screen. The robot waits for the user's answer within a minute.

If the user does not select any option within a minute, then the robot will say an encouraging phrase and wait for 5 seconds. If the user has not selected any answer, then the robot returns to the entertainment selection screen.

If the user has chosen the wrong answer, then the robot tells the correct answer and explains it. After that the robot returns to the entertainment selection screen.

If the user has chosen the correct answer, then the robot tells the confirmation phrase and explains, why this answer is correct. After that the robot returns to the entertainment selection screen.

## **6.7. Prediction**

The robot tells a replica in which it invites the user to fill in the name and date of birth. After the user fills in the data, the robot tells a special replica and makes movements imitating wizard. According to the entered date of birth, the robot determines the user's zodiac sign and tells the corresponding astrological forecast for this year. Then the robot tells the final replica and returns to the entertainment selection screen.

## **6.8. Song**

The robot tells a replica about a song. The song turns on and the robot performs movements imitating the movements of a singing artist. The robot tells one more replica about the song and returns to the entertainment selection screen.

## **6.9. Illusion**

The robot tells greeting replica. The robot gesticulates with its hands and expresses emotions on its face while interacting with user. After that, 9 images are displayed on the screen, the robot asks to choose one of them and memorize. Then the robot will ask the user to make certain movements to make the focus work. After that, the robot tells his guessing and shows corresponding image. Then the robot tells the final replica and returns to the entertainment selection screen.

## **6.10. Congratulation**

The robot suggests to choose the holiday. After that, the robot asks to enter the name of the person to be congratulated. Then the robot asks to enter the name of the user to fill in the "from" field. After that, the robot tells user to prepare the smartphone camera and get ready to start record the video. After that, the timer is activated so that the visitor has time to prepare the smartphone and turn on the recording. Next, the robot reads the congratulations. The robot's speech is duplicated by the text on the screen. The robot gesticulates with its hands and expresses emotions on its face while interacting with user. After completing the congratulations, the robot offers to send a text with congratulations to e-mail, for this you need to enter email. Then the robot tells the final replica and returns to the entertainment selection screen.

## **6.11. Phygital Engagement**

The robot tells greeting replica and invites the user to fill in the names of groom and bride. Next, the robot tells the speech, then the wedding music is played and then the robot invites users to put their palms on the screen. The robot gesticulates with its hands and expresses emotions on its face while interacting with user. When both hands are on the screen, the robot says oaths and confirmation that the registration has made. Next, the robot takes a pose for a photo and takes a photo. The photo is displayed on the screen. The visitor can enter their email address and email the resulting photo to themselves. Then the robot tells the final replica and returns to the entertainment selection screen.

## **7. Transport and Storage Conditions**

### **7.1. Transport Conditions**

1. The product should only be transported in the specially designed transport cases in which it is supplied.
2. The product in its transport cases can be transported by all types of enclosed transport. It is recommended to transport at air temperatures between +10°C and +35°C and a relative humidity of up to 70%.
3. If transporting the product in sub-zero temperatures, it is necessary to leave the it to warm up to at least +10°C. Let it stand powered-off in a heated room for at least two hours before turning it on.
4. The robot and other equipment must be firmly attached inside the transport case to avoid hits of the robot and accessories against each other and against the sides of the transport case.
5. The robot and other equipment should be placed inside the transport cases in special slots of logement which were designed to match the robot's and equipment shape.
6. Before transporting, make sure that there are no foreign objects inside the transport cases. The presence of foreign objects can damage the robot's components and equipment.
7. Ensure that transport cases are not a subject to any impact or movement inside the vehicle during transportation.
8. The robot's neck and torso must be in the zero position (must be straightened, not crouched) during transportation.
9. The product transport cases are a fragile cargo. Ensure appropriate transport and storage conditions (as specified on the transport/shipping label) for the entire transportation.

### **7.2. Storage Conditions**

1. The storage area shall be kept clean and tidy. Clutter can cause robot/equipment damage or human injury.
2. Dampness, water evaporation, presence of combustible liquids and gasses are not allowed in the storage area.
3. The product must be stored in a heated and ventilated room away from direct sunlight, at a temperature between 0°C and +40°C (+25°C recommended) and a relative humidity of 65%.
4. To avoid undesirable consequences, unauthorized persons or children should not be allowed in the storage area.

## 8. Warranty Terms and Conditions

1. If you encounter any difficulties while using the Product, please contact the manufacturer.
2. When receiving the product, check completeness of its package contents and operability.
3. Carefully read this User Manual before starting work.
4. The legal basis for these warranty conditions is the existing Legislation.
5. The warranty period for this product is 12 months from the date of delivery.
6. The service life of the product directly depends on the operating conditions.
7. Срок службы робота напрямую зависит от условий эксплуатации.
8. The warranty does not cover malfunctions of the robot resulting from:
  - failure by the user to comply with the instructions for use of the robot;
  - mechanical damage caused by external hit impact or any other impact;
  - use of the product for purposes other than those for which it was intended;
  - natural disaster;
  - adverse weather or other external influences on the robot, such as rain, snow, high humidity, heating, aggressive environments;
  - the use of accessories, consumables and spare parts which were not approved by the manufacturer;
  - the penetration of foreign objects, insects, animals, materials or substances into the robot;
  - overload that caused the failure of motors, servos, switches, monitors and other components. Unconditional signs of robot overload include, but are not limited to: destruction of the touchscreen display matrix, deformation or melting of parts and components, darkening or charring of the insulation of wires due to high temperatures.
9. The warranty does not apply to:
  - the products that have been opened, repaired or modified without the assistance of the manufacturer’s specialists;
  - the accessories and spare parts that have failed due to normal wearout, such as body parts and consumables, including servos, LEDs and bolted joints.
10. The manufacturer undertakes to repair the defects of the product free of charge or to replace it during the warranty period, provided that the defects were not caused by the failure of the user to comply with the instructions for use or storage of the robot.