VOZROZHDENIE LLC

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APPROVED BY

VZR.2515.001

TRIPOD TURNSTILE
CUBE C-05,C-05-2R MODEL

VZR.2515.001IM

INSTALLATION MANUAL

40 sheets

2021

TABLE OF CONTENTS

This Installation Manual (IM) applies to Oxgard CUBE C-05,C05-2R tripod turnstile and its variants (hereinafter referred to as the product). Product firmware version: FW C-10

Design variants:

C-05 – Electromechanical tripod turnstile.

C-05-2R electromechanical tripod turnstile + reader 2 pcs.

IM defines rules and a procedure for installation and commissioning of the product.

Before installing the product, please read the Operation Manual VZR.2515.001 OM as well.

Due to constant work on improving the product, changes to its design may be made, which are not represented in this IM revision.

The following abbreviations are used in this document:

OM — Operation Manual;

IM — Installation Manual;

PSU — power supply unit;

CP–control panel symbol;

BCP 01 — basic control panel;

UCP 02 — universal control panel;

ACS — access control system;

SFAS — security and fire alarm system;

NC — normally closed connection;

NO — normally open connection.

1 GENERAL INSTRUCTIONS

For general safety when assembling and installing the product, take into account all the recommendations and instructions contained herein.

Before starting installation work, completely de-energize the product.

 **DO NOT:**

INSTALL THE POWER SUPPLY UNIT INSIDE THE TURNSTILE HOUSING AS IT MAY RESULT IN ELECTRIC SHOCK TO PERSONS.

INSTALL THE TURNSTILE OUTSIDE DRY AND HEATED ROOMS.

PREVENT OR ACCELERATE MOVEMENT OF THE TURNSTILE ARMS.

APPLY PASTES AND LIQUIDS CHEMICALLY AGGRESSIVE TO MATERIALS OF THE HOUSING WHEN CLEANING THE PRODUCT.

2 SAFETY PRECAUTIONS

Installation should be carried out with observance of “Regulations for Operation of Consumer Electrical Installations” and “Safety Regulations for Operation of Consumer Electrical Installations”.

The product shall only be installed by qualified personnel trained in handling of electrical devices and instructed on safety precautions when handling the electrical installations with voltages of up to 1000V.

 **ATTENTION:** FAILURE TO COMPLY WITH THE SAFETY REQUIREMENTS SPECIFIED IN THIS SECTION CAN RESULT IN DEATH AND DAMAGE TO HEALTH, COMPLETE OR PARTIAL LOSS OF PERFORMANCE OF THE PRODUCT AND/OR AUXILIARY EQUIPMENT.

 **ATTENTION:** MANUFACTURER WAIVES ANY RESPONSIBILITY FOR DEATH AND DAMAGE TO HEALTH, COMPLETE OR PARTIAL LOSS OF PERFORMANCE OF THE PRODUCT AND/OR AUXILIARY EQUIPMENT IF USER FAILS TO COMPLY WITH THE SAFETY REQUIREMENTS SPECIFIED IN THIS SECTION, AND ALSO VOIDS THE PRODUCT WARRANTY.

3 PREPARING THE PRODUCT FOR INSTALLATION

3.1 Procedure for transporting the product to the installation place

The product in the original package can be transported without range limitation by air, enclosed road and rail transport provided it is protected against direct exposure to precipitation and dust.

In order to avoid moisture condensation after transportation at subzero temperatures, the product shall be pre-held in a room with normal climatic conditions for 12 hours.

Loading and unloading operations should be carried out in compliance with safety regulations.

3.2 Rules for unpacking the product

3.2.1 Perform visual inspection of the packaging. There should be no visible damage on the package.

3.2.2 Open the transportation box, unpack and check completeness of the product:

1) turnstile stand;
2) CP with cable;
3) base cover.
4) barrier arms

3.3 Rules for visual inspection of the product

3.3.1 Check completeness of the product.

Completeness shall be checked according to the Logbook VZR.2515.001 LB.

3.3.2 Visually inspect the product. There should be no visible damage on the product.

3.3.3 If any damage is found, prepare a Claim Report.

3.3.4 Figure 1 – overall dimensions of the turnstile.

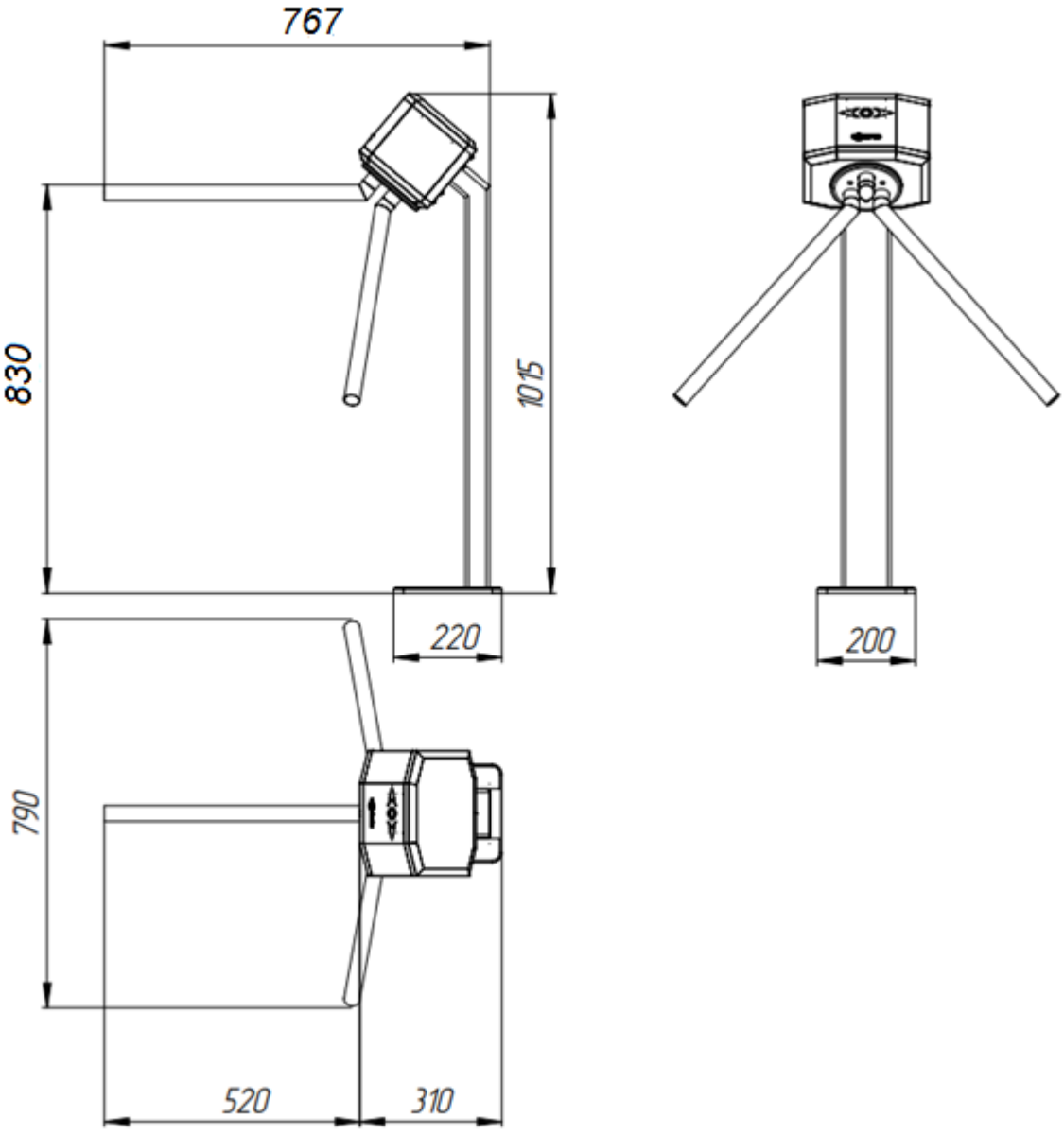


Figure 1 – Overall dimensions of the turnstile

3.4 Product installation place requirements

 **ATTENTION:** TO AVOID WAVING AND/OR OVERTURNING DURING OPERATION, INSTALL THE TURNSTILE SECURELY. IN CASE OF PRODUCT INSTALLATION ON LOW STRENGTH FLOOR - TAKE MEASURES FOR FLOORS STRENGTHENING IN THE PLACE OF INSTALLATION.

Figure 2 – when installing the turnstile, it is necessary to consider the possible free travel of the barrier arm (it makes 6 degrees on each side in STOP mode).

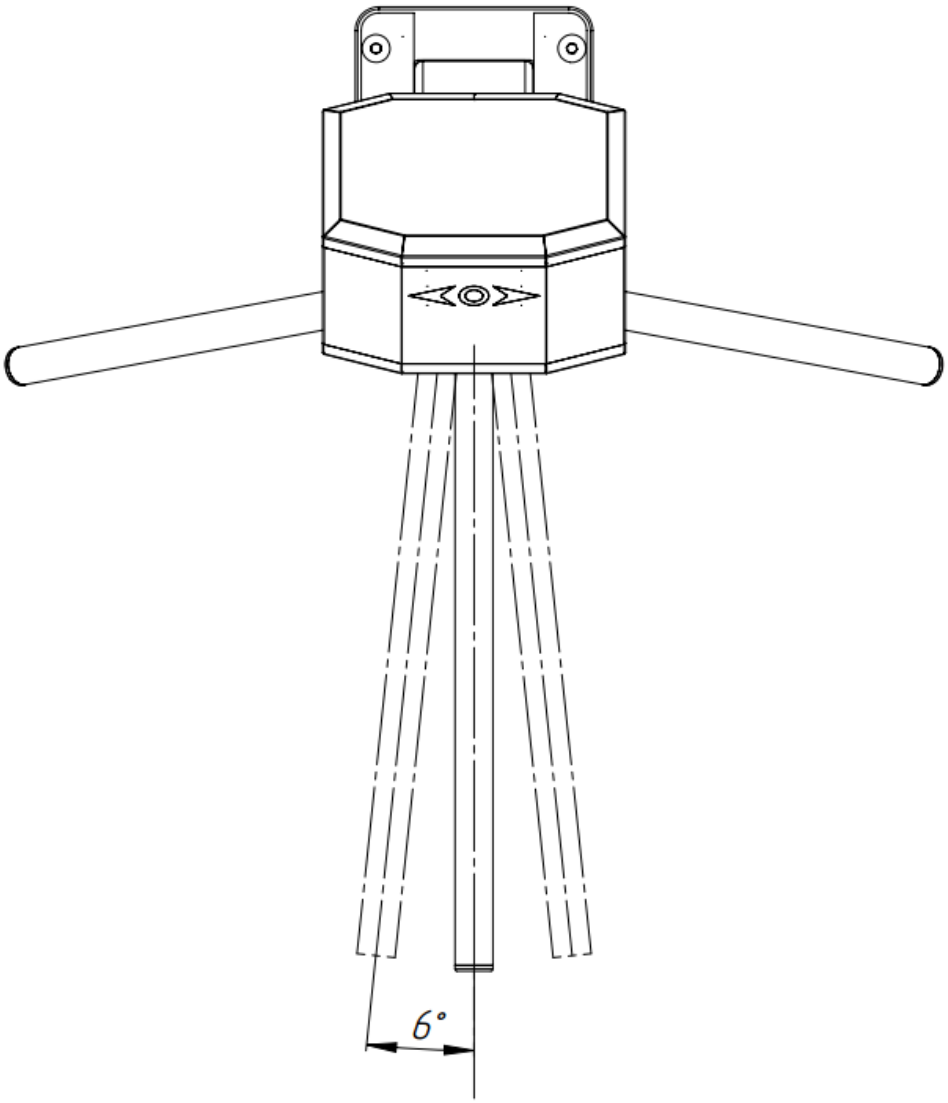
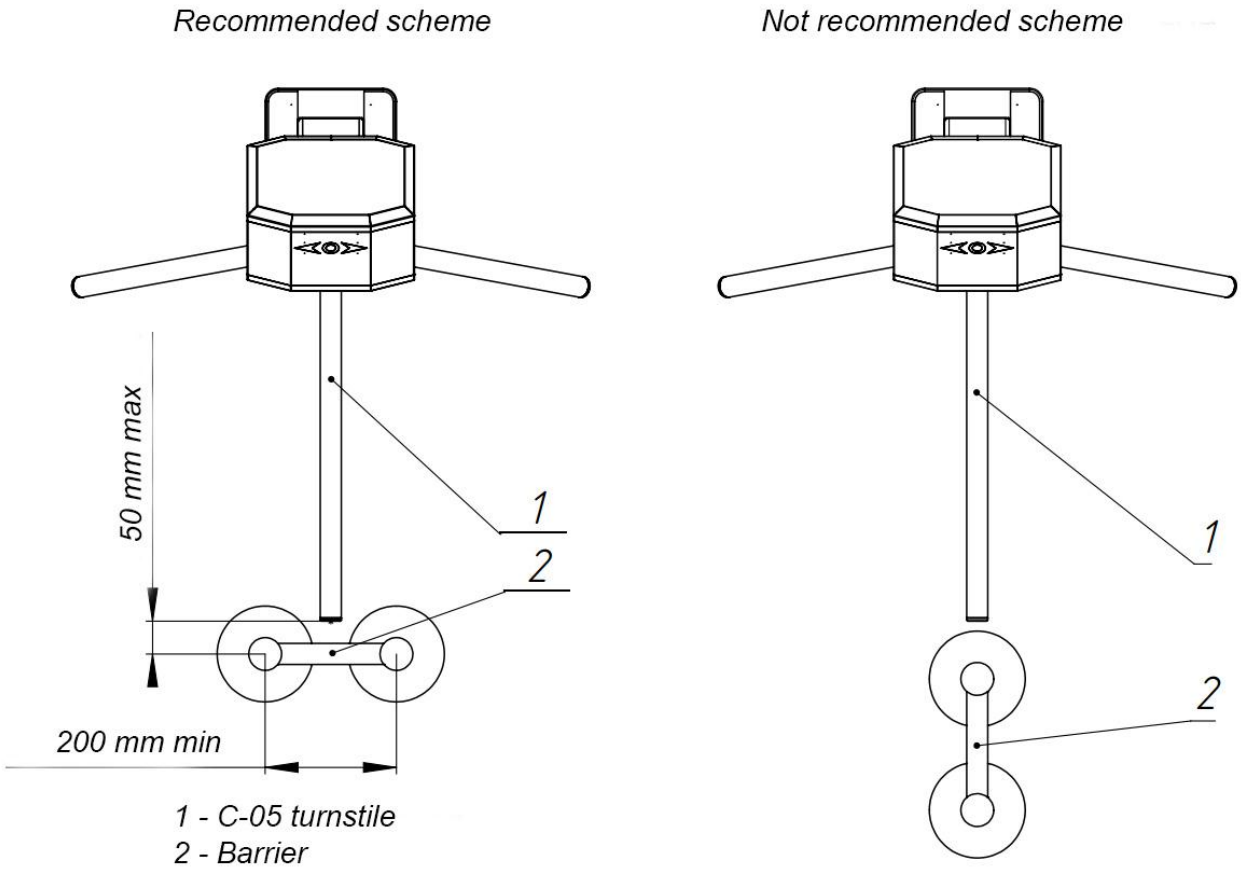


Figure 2 – Possible free travel of the barrier arm in "STOP" mode

3.5 Procedure for checking compliance of the installation place

ATTENTION: THE PASSAGE ZONES SHALL BE ARRANGED TO ALLOW RECORDING OF PASSAGES DURING TURNSTILE OPERATION UNDER ACS CONTROL AND TO AVOID UNAUTHORIZED PASSAGES.

3.5.1 Figure 3 – turnstile passage zone arrangement and guidelines on product orientation.



Recommended scheme **Not recommended scheme**

Figure 3 – Turnstile passage zone arrangement.

4 PRODUCT INSTALLATION AND DISMANTLING

4.1 Equipment required

Equipment to be used for the turnstile installation:

1) electric perforating machine
2) 12 mm carbide drill bit for drilling anchor holes in the floor (we recommend to use the anchor with the screw of the FHII 12/15 SK type);
3) S5 key for the screws with an internal hexagon;
4) slot head screwdriver;
5) plumb or level;
6) steel shims for turnstile leveling;
7) round file;
8) side-cutting pliers.

4.2 Product installation

ATTENTION: CAREFULLY READ THIS SECTION OF THE MANUAL BEFORE INSTALLING THE PRODUCT

4.2.1 Prepare a horizontal area at the product installation site.

4.2.2 Prepare a chase or cable conduit going from the site to the place of installation of the PSU, CP and, where necessary, to the ACS and SFAS connection point.

4.2.3 Turnstile installation site:

Figure 4 – prepare 3 holes (12 mm in diameter) in the floor for the turnstile stand anchors according to the installation dimensions.

Position of mounting holes relative to the external dimensions of the turnstile is shown in Appendix B.

The depth of the embedded hole is 120 mm, it should exceed the anchor length by 5 mm. Insert anchors into the holes.

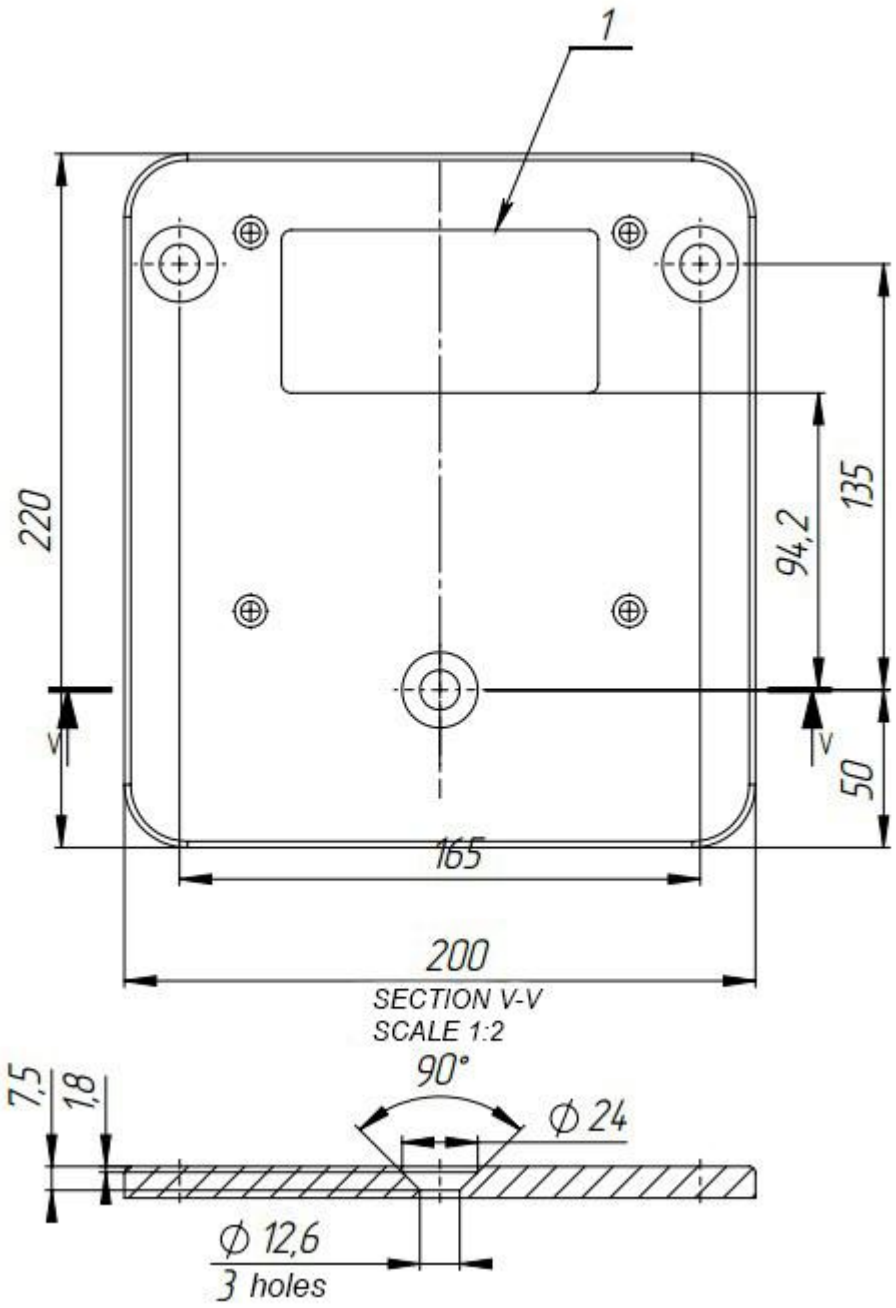


Figure 4 – Installation dimensions of the turnstile site

4.2.4 Figure 4 – cable routing is exercised through hole (1) at the lower turnstile stand plate.

4.2.5 Lay the CP connection cable, PSU cable and, if provided, the ACS and SFAS cables in the cable conduit or chase.

4.2.6 Install the turnstile stand onto the prepared site.

4.2.7 Insert cables from the CP, PSU, ACS and SFAS cables into the turnstile housing, after passing them into the turnstile stand. Secure the cables with cable ties.

4.2.8 Align the holes in the turnstile stand with the floor anchors (Figure 5 – 1).

Check turnstile verticality in 2 planes, if necessary, use steel shims of required thickness for the turnstile correct installation.

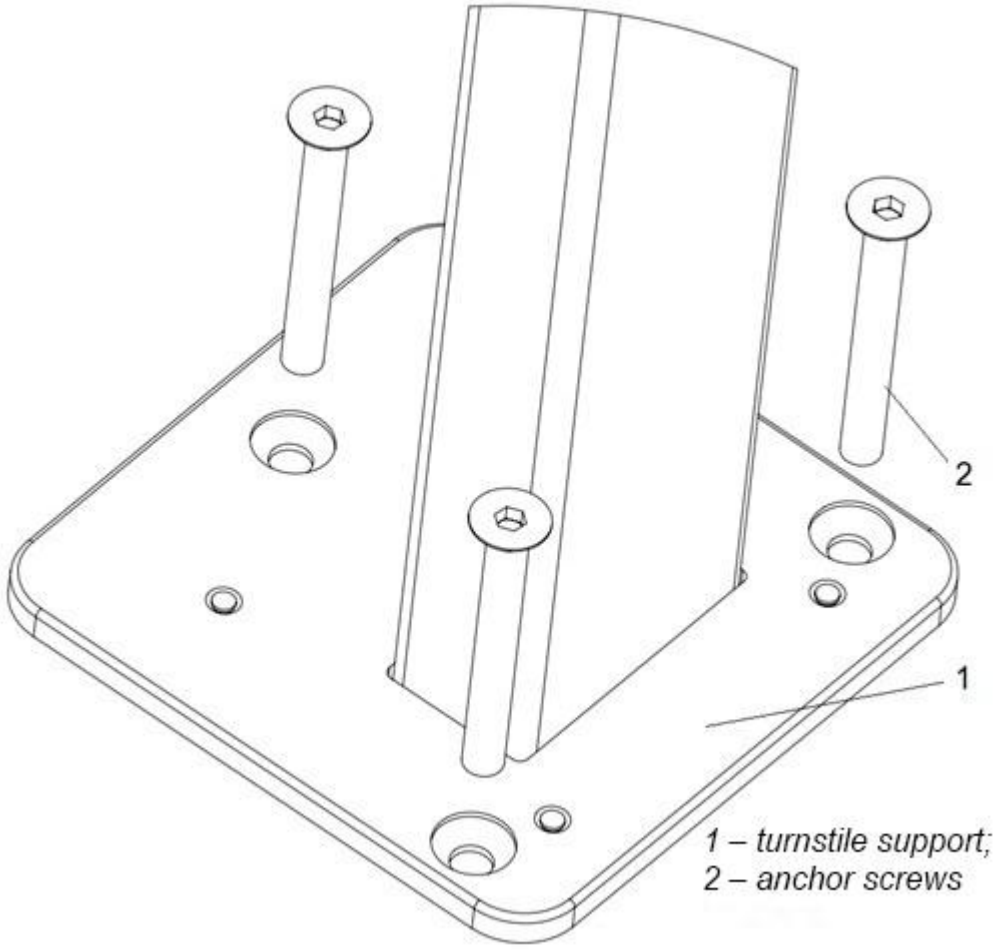


Figure 5 – Preparation to install the turnstile

Fix the turnstile stand with three screws (Figure 5 – 2) by screwing them into the appropriate anchors using S5 key for the screws with an internal hexagon.

Secure the base cover with the double-sided adhesive tape.

Install the barrier arm assembly on the turnstile base

(Figure 6 – 1)

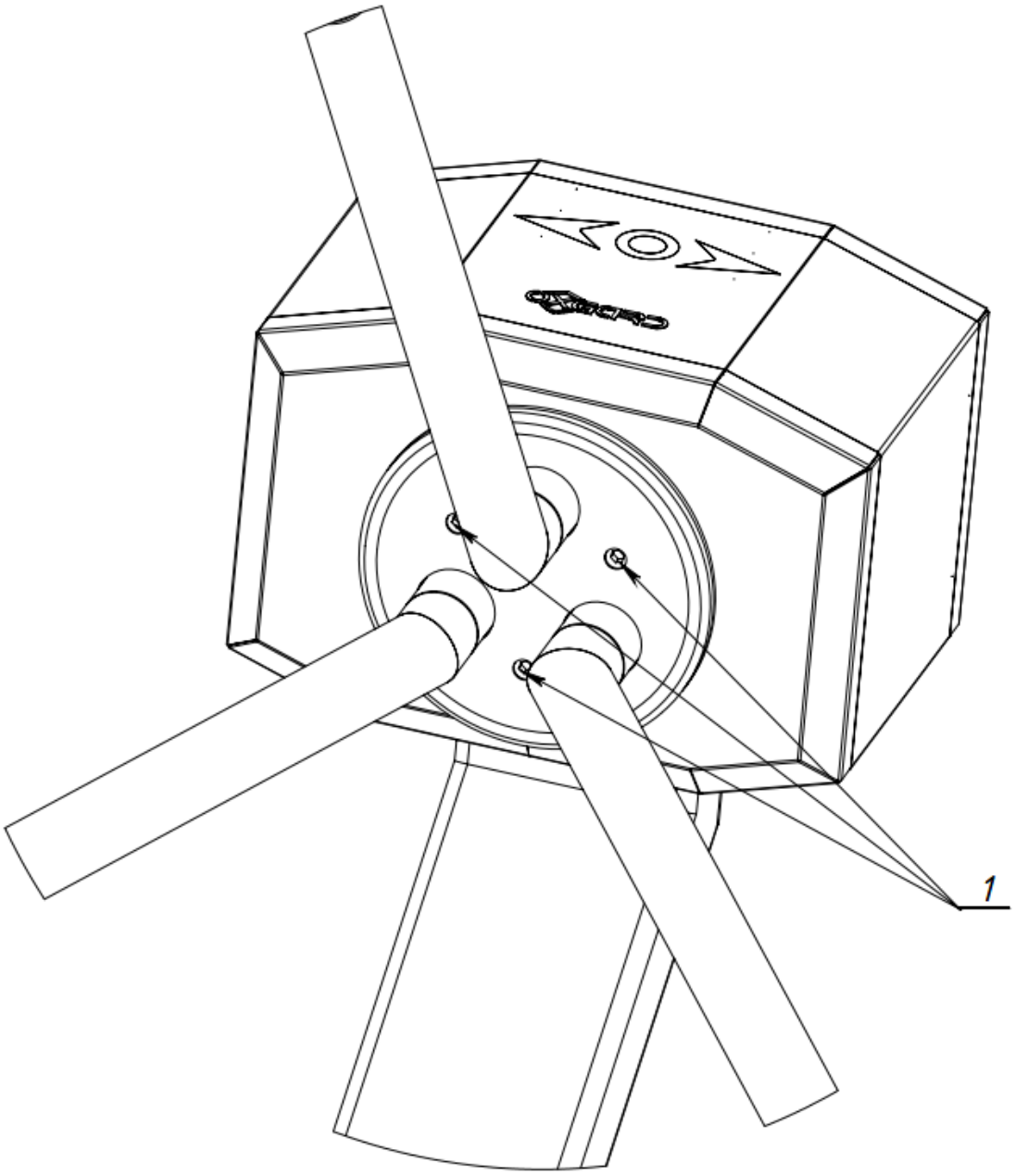


Figure 6 – Barrier arm assembly mounting.

4.2.9 Remove the protective film from the turnstile housing.

4.3 Dismantling the product

4.3.1 Dismantle the product as follows for sending it for calibration or repair:

1) turn the product power off;
2) disconnect the product from power supply;
3) disconnect the product cable part from auxiliary cables;
4) dismantle the barrier arm assembly
5) dismantle the product from the installation pad.

4.3.2 Before packing, clean the product from dust and dirt.

4.3.3 Put the product in the packing box.

5 CONNECTING AND SETTING THE PRODUCT

Connection of the PSU, CP and ACS is carried out using the control board located in the block of barrier arms under the safety enclosure.

To conveniently connect the turnstile and get access to all necessary contacts, the turnstile should be partially disassembled. This scope of works includes dismantling of the safety enclosure.

To do this, unscrew the four screws (Figure 7 – 1) and gently slide the enclosure upwards, taking care not to break the cables inside the protective enclosure.

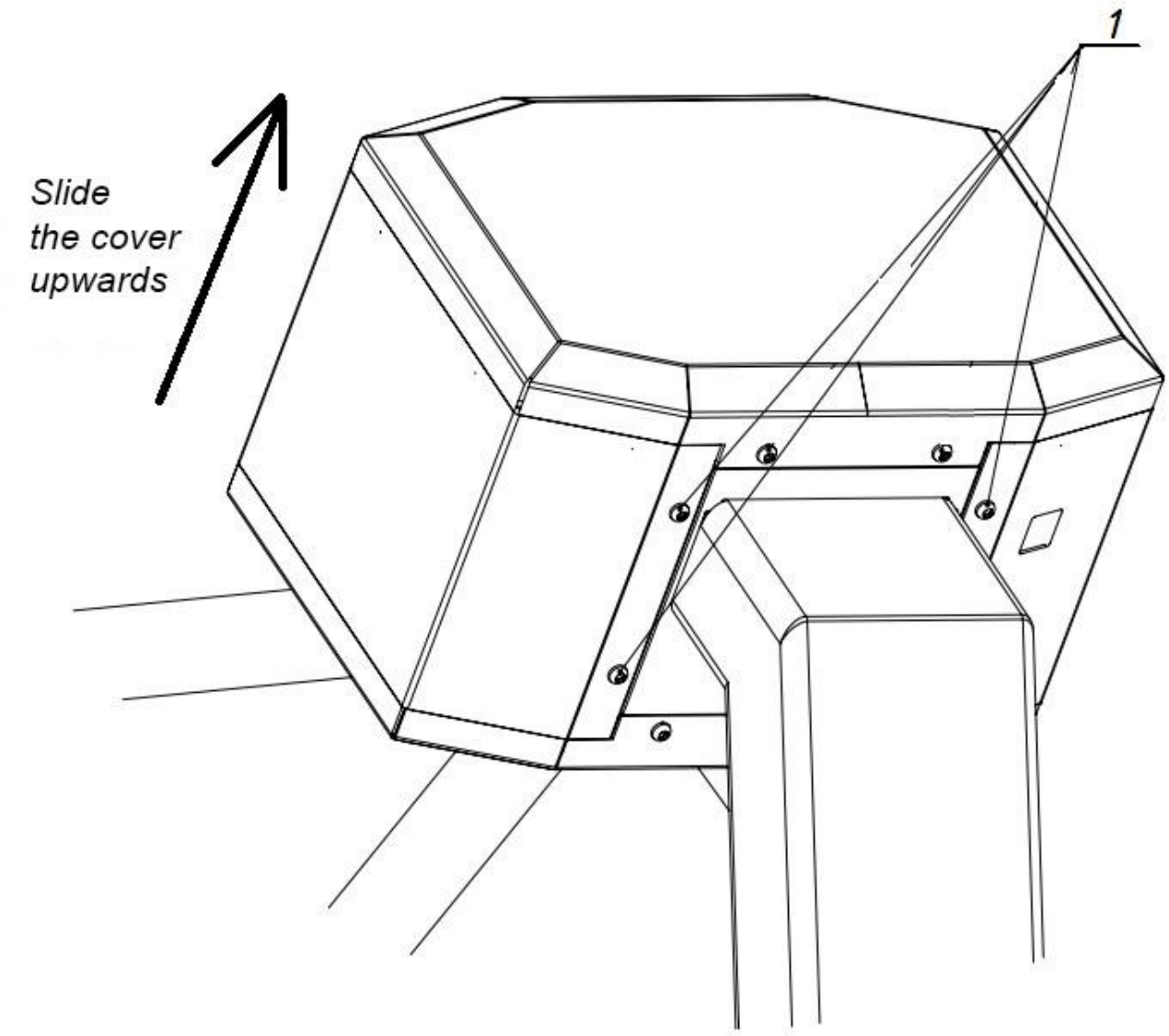


Figure 7 – Dismounting of the turnstile safety enclosure

Slide the enclosure till the end and free access to the rotation mechanism.

Figure 8 – the appearance of the control board and layout of the connectors for connecting the PSU, CP, ACS and SFAS is shown.

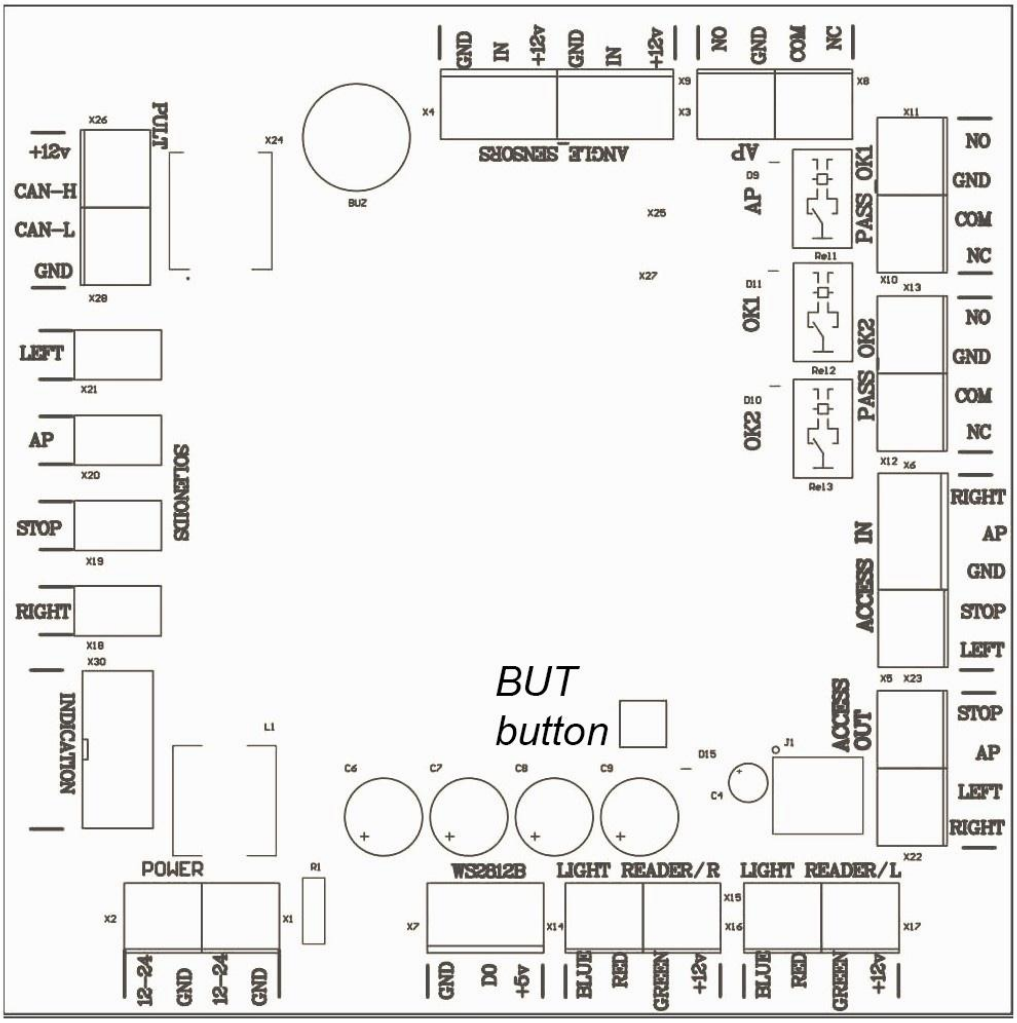


Figure 8 – Appearance of the turnstile control board

Figure 8 – The turnstile operating modes are set using the BUT button.

To select the required turnstile mode, it is necessary:

- press and hold the BUT button until a short beep. The turnstile operating mode is selected based on the number of short beeps.

- it is necessary to release the BUT button after the required number of signals, a long beep, which indicates that the desired mode has been written into the controller memory, will sound.

- when the power is off, the selected mode is not reset.

Table 1 shows the turnstile operating modes with different number of signals after pressing the BUT button.

Table 1 – Turnstile operating mode

Turnstile operating mode number	Number of short beeps after pressing the BUT button	Turnstile operating mode
0 (simple press)		Reboot (the mode is similar to turning the turnstile on/off)
1	1	Factory reset: - pulse control mode of the turnstile - the turnstile enters the STOP mode after being switched on - the turnstile enters the “ANTIPANIC” mode when controlled using the ACS, after the AP and GND terminals get connected - the turnstile is controlled by the control panel, the status of the buttons is transmitted to ACCESS OUT outputs (p. 5.4)
2	2	- switching between the pulse and potential control modes of the turnstile (p. 5.3)
3	3	- the turnstile enters the mode of free passage to the left after being switched on.
4	4	- the turnstile enters the mode of free passage to the right after being switched on.
5	5	- activation of the “ANTIPANIC” input after the AP and GND terminals are closed/opened
6	6	Disabling/enabling of the control panel
7	7	Possibility to switch the relay terminals into hold or passage counting mode, in “ANTIPANIC” mode
8	8	- test mode for checking the turnstile performance

5.1 Power connection

DO NOT:

USE THE POWER SUPPLY UNITS WITH AN OUTPUT CURRENT BELOW 5.0 A.

CONNECT THE TURNSTILE USING POWER CABLE WITH CROSS-SECTION BELOW 1.5 MM^2 WHEN LENGTH OF THE SUPPLY CABLE IS MORE THAN 10 M – IT IS RECOMMENDED TO USE CABLE WITH CROSS-SECTION OF 2.5 MM^2.

 **ATTENTION:** IT IS NOT RECOMMENDED TO INSTALL POWER SUPPLY UNIT AT A DISTANCE OF MORE THAN 25 M FROM THE TURNSTILE.

The turnstile is powered by 12 V DC power supply. The maximum consumption is 4.5 A. The PSU should be selected on the basis of these parameters.

It should also be taken into account that voltage drop increases when the supply cable length is increased (operating voltage range is provided in the Operation Manual VZR.2515.001 OM).

Install PSU in a place providing easy operator access.

Connect the PSU cable to POWER +12U and GND terminal group on the control board. Make sure that the cable is securely connected.

The POWER block has additional power supply terminals for connecting an external controller.

5.2 Control panel connection

The turnstile can be supplied with two different control panels:

1. Basic control panel BCP 01

2. Universal control panel UCP 02 with extended capabilities.

1. Basic control panel BCP 01 The case of control panel contains only switching buttons, there are no electronic components in it. The control panel allows to control the turnstile, provides execution of commands to allow one-time passage to the right, left, stop and anti-panic commands. The execution of these commands is ensured by connecting the five-wire cable of this console to the *Access Control System* inputs on the cross-board. This control panel provides a short circuit between the cross-board inputs LEFT, RIGHT, STOP, AP and GND. Connected ACS system is connected to the same contacts. The *Control Board* contacts are not used when connecting this control panel. When using this control panel, it is necessary to agree with the manufacturer of the external controller for its use.

BCP 01 cannot:

1. This control panel does not have backlighting of buttons for switching on the preset mode.

2. Provide reusable easy access to one side.

3. Provide reusable free passage on both sides

4. Provide button reassignment from right to left (button reverse)

5. Autotest mode is not enabled.

2. Universal control panel UCP 02. The control panel is a complex programmable device. Allows, in addition to the main functions of the turnstile control, to change the settings of the turnstile operating modes.

The panel is connected via the CAN bus with a four-wire signal cable.

It ensures:

1. Illumination for the control panel buttons of the preset control mode.
2. Multiple free passage to one side.
3. Multiple free passage to both sides
4. Provides button reassignment from right to left (button reverse)
5. Turning on the autotest mode, the turnstile is checked according to its main operating modes in this mode.
6. Sound accompaniment when pressing the control panel buttons. The buttons will beep when pressed (the sound can be turned off).

ATTENTION control unit BCP 01 can be used for turnstiles C-01,C-02,C-03,C04. This control panel does not provide light indication and it has minimal functionality. Its connection is also different from UCP 01.

Wiring diagram of BCP 01, according to the colors of the wire coming out of its body. For turnstiles C-01,C-02,C-03,C04.

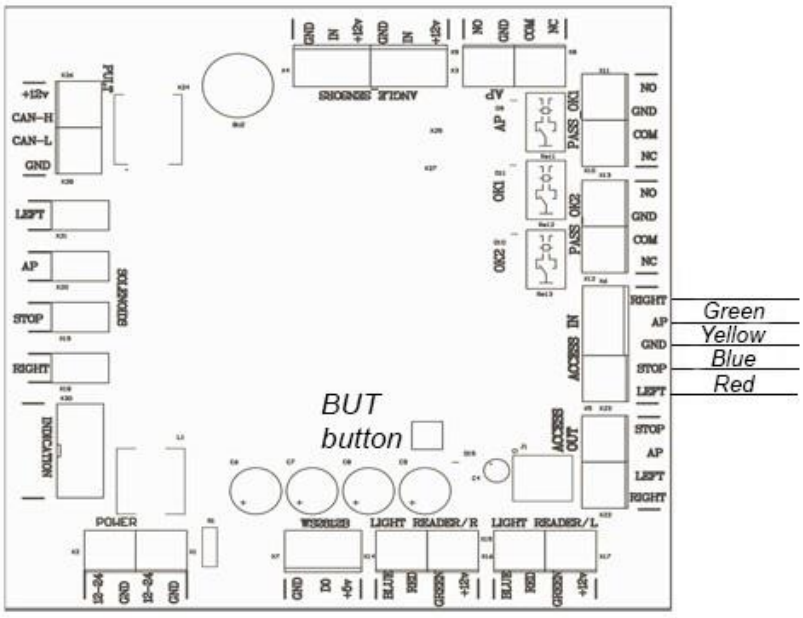


Figure 8.1 - Connection diagram for the simplified control panel

UCP 02 is connected through the TJ6P6C telephone socket to the X24 socket with the PULT inscription using the RJ 02 (TP-6P6C) telephone socket.

TJ6P6C

RJ 12(TP-6P6C)

Figure 9 – The turnstile UCP 02 should be connected on the basis of terminal identifications in accordance with the figure

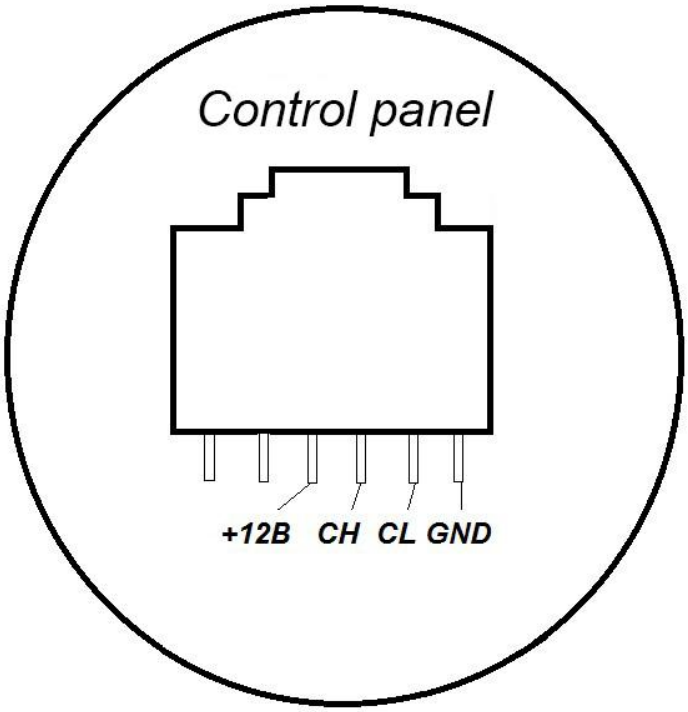


Figure 9 – Arrangement of the control panel cable wires.

5.3 Access control and management system connection (optional)

The ACS controller should be connected to the terminal group ACCES_IN and ACCES_OUT.

Identification of terminals: LEFT, RIGHT, STOP, AP, GND. The terminal assignment is shown in Table 2.

Table 2 – ACS terminal assignment

Identification of terminals	Terminal assignment
LEFT, RIGHT	one-time passage left/ right (lowest priority)
STOP	passage forbidden (STOP mode) (medium priority)
GND	common terminal
AP	free passage in both directions (“Antipanic”) (highest priority)

Inputs for ACS connection differ in priority:

1) AP input has the highest priority. If the AP command was sent to this input (AP was closed to GND terminal), the turnstile is in free passage mode and **DOES NOT RESPOND(!)** to any commands other than STOP; the green arrows are flashing in both directions on the indication band. The AP command can be withdrawn either by the STOP command from the ACS (or control panel), or by rebooting the turnstile.

2) operation of the "ANTIPANIC" input can be set to be triggered by closing or opening of the AP and GND contacts (see Table 1)

3) LEFT and RIGHT have the same low priority and enable one-time passage in either direction. If both inputs are closed, passing is allowed in the side whose input closed first. If pass is not completed, the turnstile will automatically switch to STOP mode after 5 seconds.

4) Free access in both directions can be enabled only in potential control mode by simultaneous feeding of signals to the LEFT and RIGHT inputs or by sequential feeding of the LEFT and RIGHT signals.

 **ATTENTION:** IF THE AP INPUT IS CLOSED, THE COMMANDS FROM THE PANEL ARE NOT ACCEPTED, SINCE THE ACS HAS A HIGHER PRIORITY (EXCEPT FOR THE STOP COMMAND).

LEFT and RIGHT inputs can operate in both potential and pulse mode (they trigger when closed to GND contact). Pulse mode is set by default.

To switch to the potential operating mode, it is necessary to use the instructions provided in Table 1. In this case, left/right passing mode is enabled only for the time when control signal is sent to LEFT/RIGHT inputs.

Free passing mode can be set by sending control signals to both inputs simultaneously (only in potential control mode). Priority of LEFT and RIGHT inputs remains unchanged when switching to pulse mode.

Two dry contact relay outputs for the ACS are installed on the control board - PassOk1 (to the right) and Pass PassOk2 (to the left).

NO and COMM – normally open connection, NC and COMM – normally closed connection.

Triggering of one of the terminal groups indicates that a pass has been made in appropriate direction (PassOk1 - to the right, PassOk2 - to the left). The dry contact closes/opens when the barrier arm is rotated at an angle of 60 degrees and returns to its original position after complete passage.

The AP dry contact relay output for the ACS is also installed on the control board. Its terminals (NC, NO and COM) close or open when somebody is passing either side through the turnstile. When the turnstile enters the AP mode (pass counting mode), the D9 diode lights up at each pass.

The NC, NO and COM terminals are permanently closed or open in the hold mode and the D9 diode is constantly on.

Figure 10 – LEDs are installed on control board to monitor its operation.

1) D11 is indicative of a pass to the right and relay activation (PassOk1 – to the right).

2) D10 is indicative of a pass to the left and relay activation (PassOk2 – to the left).

3) D9 is either constantly on and indicative of the AP command activation (in its hold mode). Or D9 is indicative of each pass (in the pass counting mode). It can be selected by mode 7 (according to Table 1).

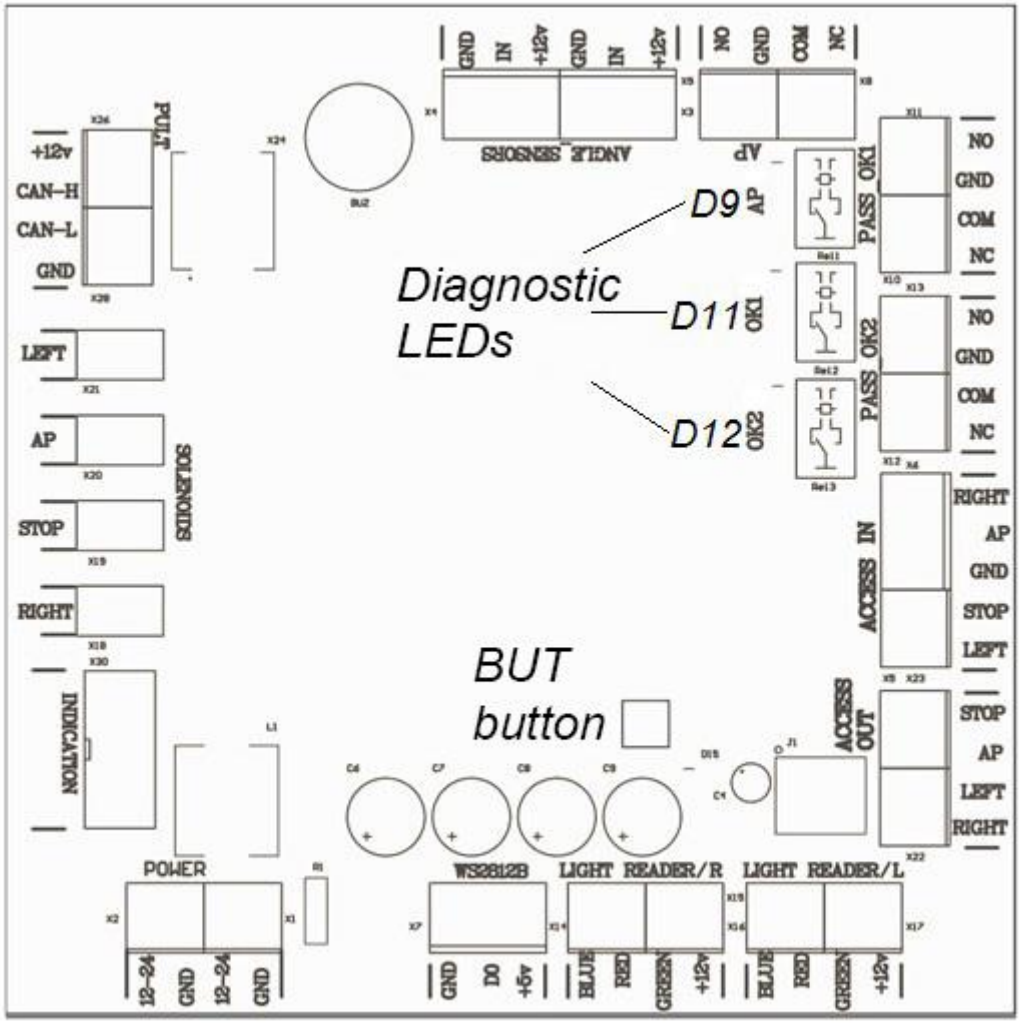


Figure 10 – Location of control LEDs on the motherboard

Figure 11 – To connect the controller, it is necessary to remove the safety cover from the turnstile, make connections with the ACS and the control panel, fix

the wires to the protective cover of the board and the turnstile housing. The installation locations of the control board and external controller are shown in Figure 10.

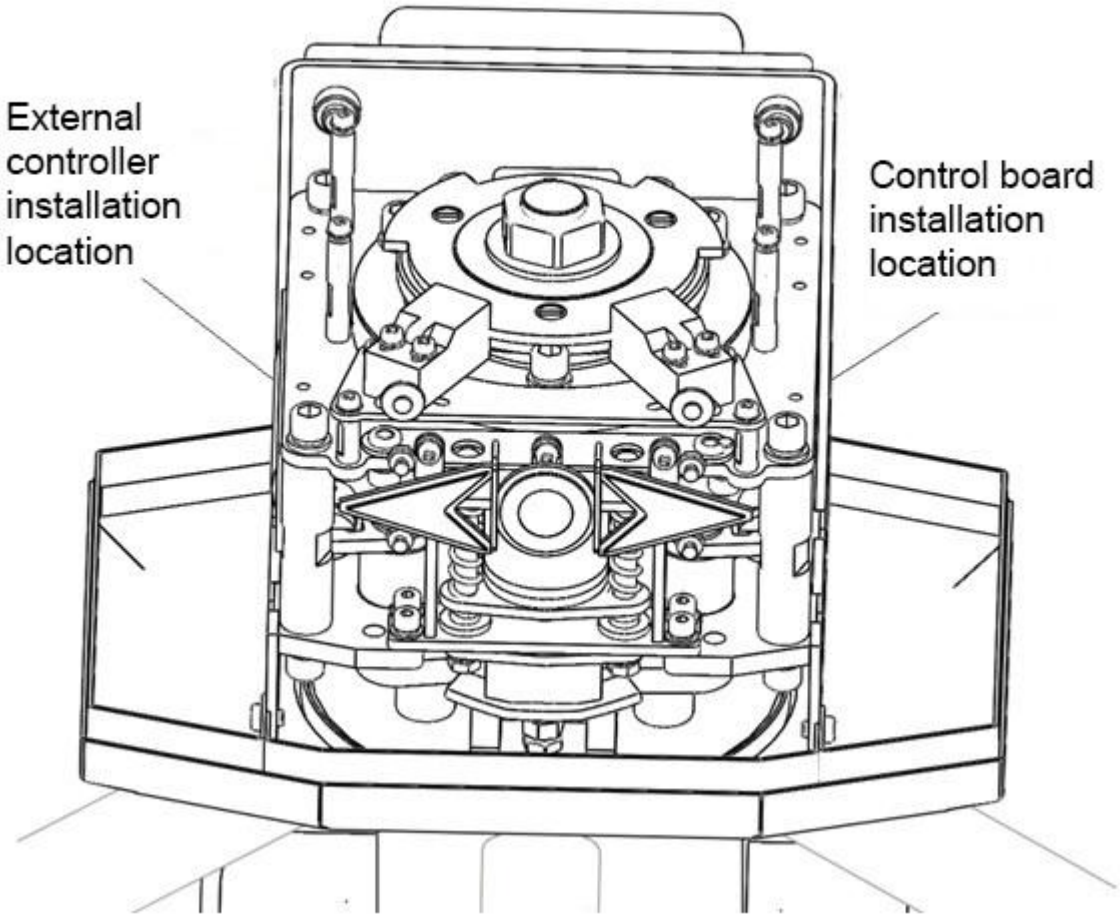


Figure 11 – Installation locations for the external controller and turnstile control board

5.4 Control panel connection to the ACS controller

ATTENTION: TO CONNECT THE CONTROL PANEL TO THE ACS CONTROLLER, IT IS NECESSARY TO USE THE UNIVERSAL CONTROL

PANEL UCP 02. TO CONNECT BCP 01 TO THE CONTROLLER, THE CONTROLLER SHALL HAVE PROGRAMMABLE INPUTS THAT WILL RECEIVE CIRCUITS FROM THE REMOTE. IN THIS CASE, CONTROLLERS PERCEPT OPENING AS BUTTON PRESSING BUT NOT AS THE OPENING FROM THE CONTROL PANEL.

In some cases, turnstile CP should be connected directly to ACS controller, since the system responds to passing allowed from the control panel (without the use of controller) as to “hacking”.

To use this diagram for connecting the turnstile, it is necessary to set the control board to mode number 6 using the BUT button (see Table 1). With this setting, the turnstile does not respond to the control panel commands and only transmits their status to the terminals of the ACCES_OUT control board terminal blocks. Figure 10 – (LEFT, RIGHT, STOP, AP), which are outputs with an open collector.

The contact assignment is shown in Table 4, Figure 12 – numbering of the control panel buttons. For this group of contacts, the maximum output current is not more than 150 mA and permissible voltage is not more than 12 V.

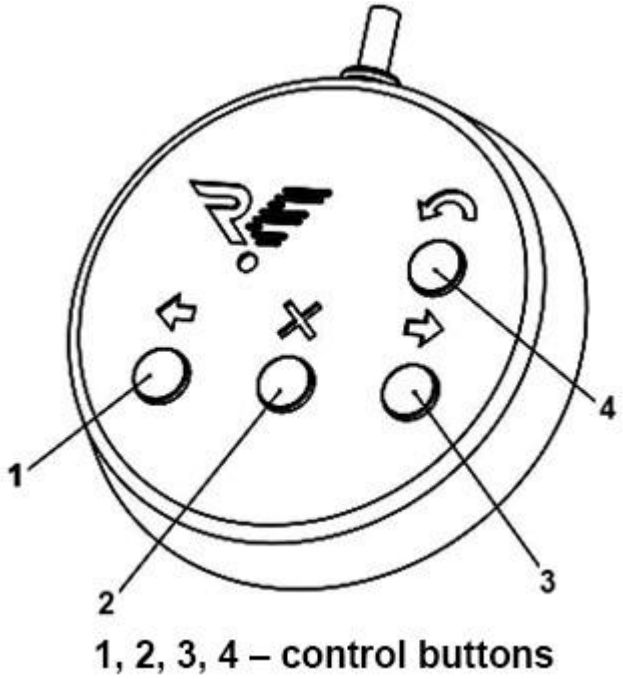


Figure 12 – Numbering of the CP buttons

Table 3 – ACCES OUT terminal group assignment

Identification of terminals	Terminal assignment
LEFT	Status of LEFT button (1)
RIGHT	Status of RIGHT button (3)
STOP	Status of STOP button (2)
AP	Status of AP button (4)

LEFT, RIGHT, STOP and AP outputs represent current status of the CP buttons – the transistor opens when corresponding button is pressed.

LEFT, RIGHT, STOP and AP outputs can be connected either directly to the ACS controller or via a relay. Figure 13 – When using the relay, it is **MANDATORY(!)** to connect a diode in parallel to the winding.

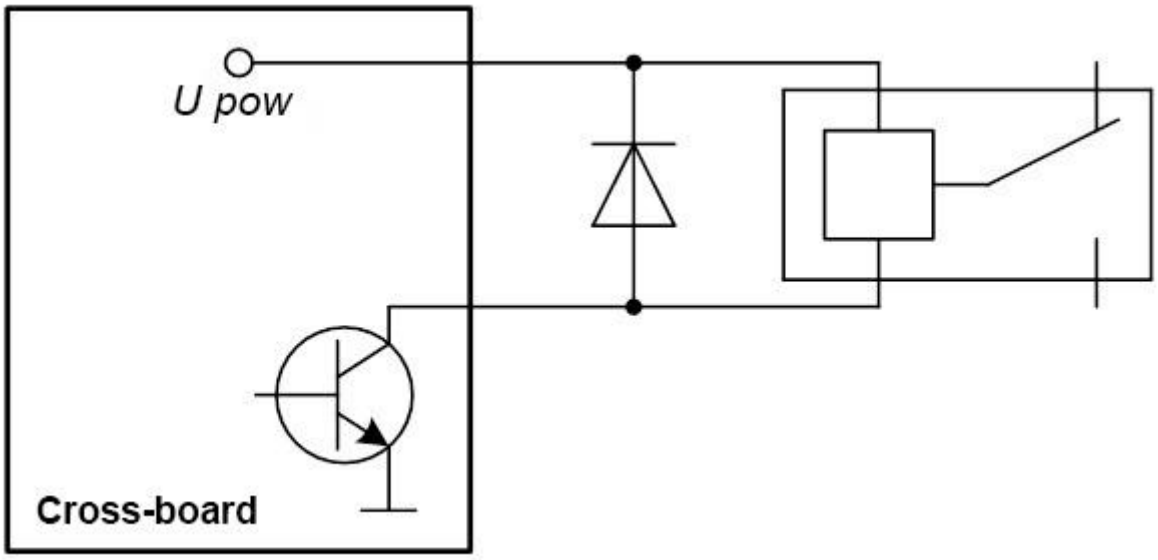


Figure 13 – Wiring diagram for diode connecting in parallel to the relay winding

Figure 14 – wiring diagram for CP connecting to ACS controller.

The controller controls the turnstile in this variant using the "LEFT", "RIGHT", "STOP" and "AP" contacts.

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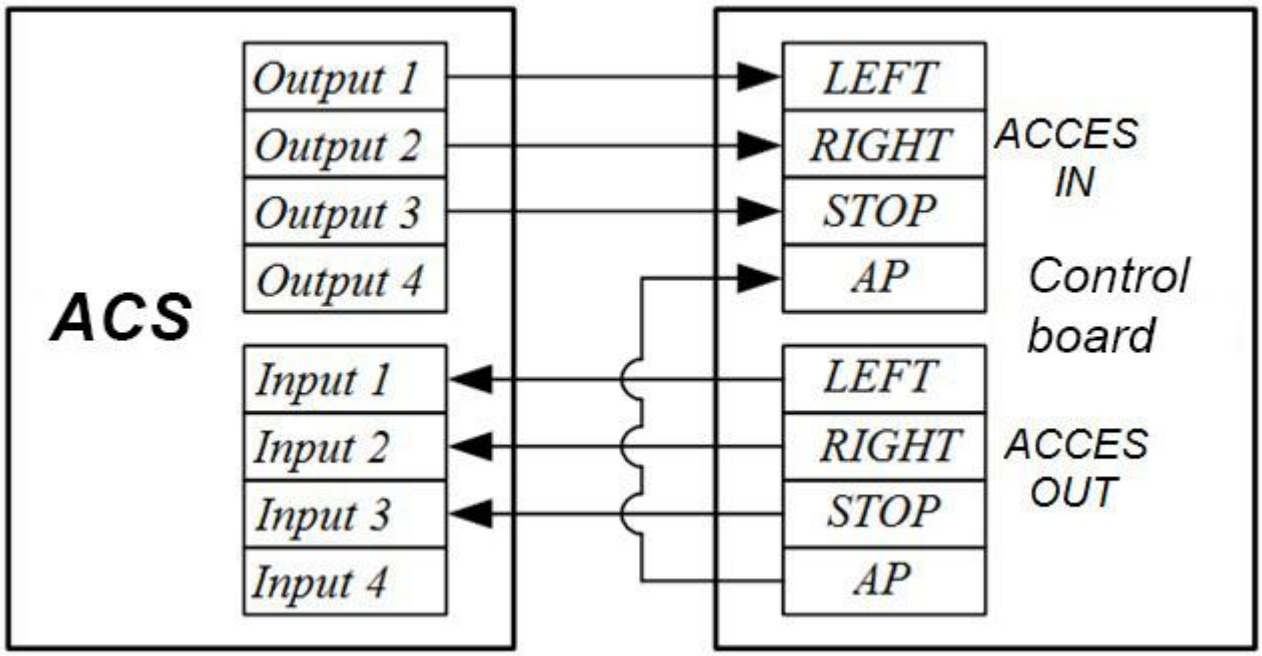

Figure 14 – Diagram for connecting the CP to the ACS controller

6 COMPREHENSIVE INSPECTION

6.1 Visual inspection and verification of the product readiness for use

6.1.1 Check the mounts of the turnstile parts and assemblies

6.1.2 Check that all cables are securely attached.

6.1.3 Turn on the turnstile and perform health check by carrying out several test passes.

6.1.4 If extraneous noise and any violations of operating modes are absent, the turnstile is ready for operation.

7 ACCEPTANCE OF THE INSTALLED PRODUCT

Acceptance of the installed product is carried out as follows:

1) representative of installation contractor demonstrates security of product installation;

2) notes on the product installation are made in the Product Service Record Section of the Logbook VZR.2115.001 LB;

3) the Installation Information Section of the product Logbook VZR.2115.001 LB is filled in;

4) the Certificate of Acceptance for Operation is issued.

APPENDIX A — Brief description of CAN2.0 data bus

A modern noise-resistant CAN2.02 standard bus is used for UCP 02 operation. Correct operation depends on many factors.

For distances more than 25 meters, it is mandatory to use a Cat5e or Cat6 twisted pair. Total electrical resistance of CP DC power supply wire should not exceed 50 Ohms.

If this requirement cannot be met, additional 12V/100mA PSU can be installed at the CP place (minimum operating voltage of PSU is 7.5 V). At the same time, 3 wires from the turnstile (CL, CH, GND) are enough for correct operation.

Two control panels can be connected to one turnstile.

An important feature of the CAN2.0 bus is the presence of 120 Ohm resistors at the ends of the bus. In a standard CP, such a resistor is already installed.

APPENDIX B — Turnstile connection diagram

Figure 15 – turnstile diagram and diagram of its connections.

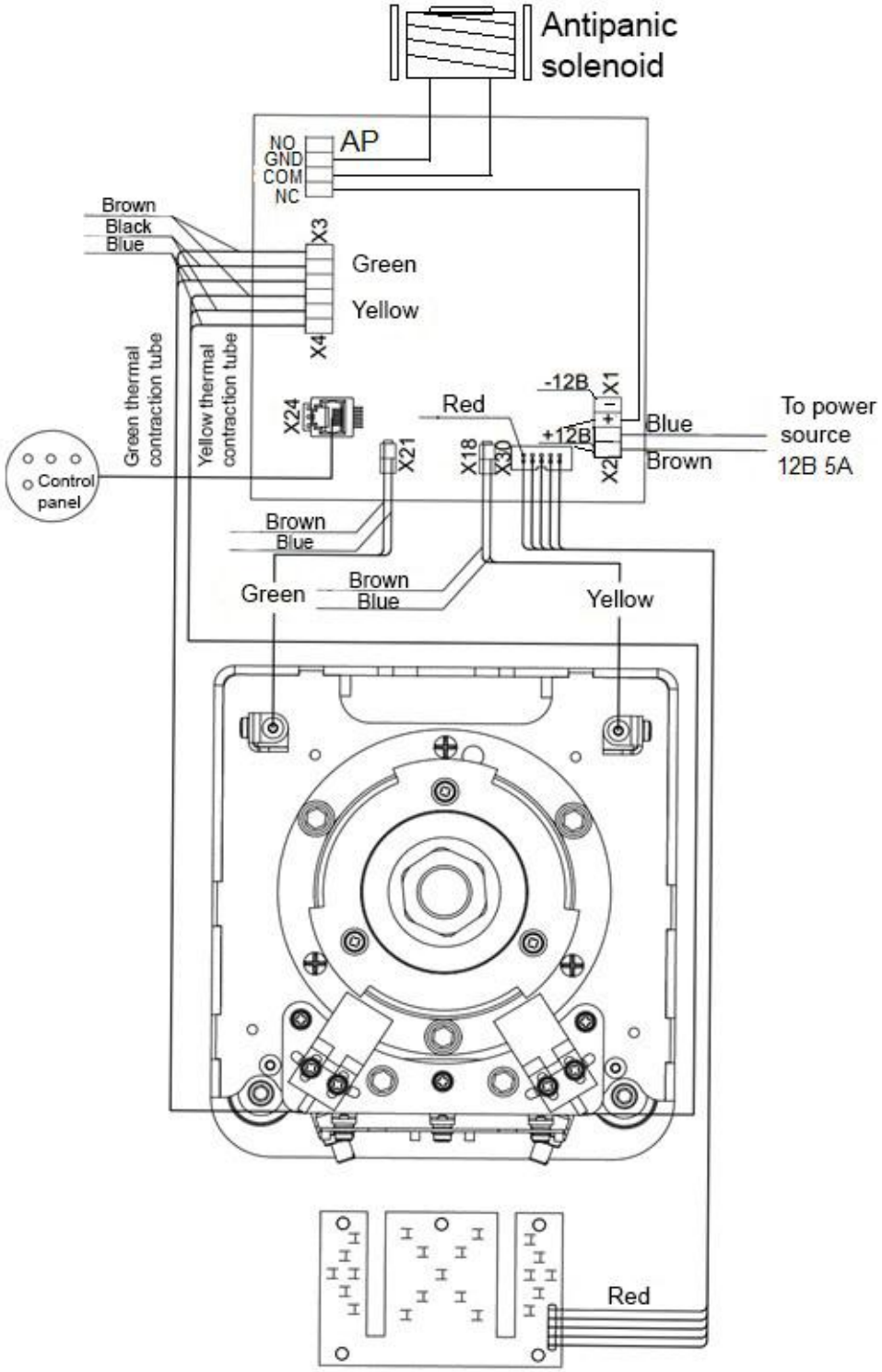

Figure 15 – Turnstile diagram

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