

# Installation guidelines

## Cube C-02 turnstile

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## CONTENTS

|                                                                                                  |    |
|--------------------------------------------------------------------------------------------------|----|
| List of abbreviations used .....                                                                 | 4  |
| 1. Basic specifications .....                                                                    | 5  |
| 2. Product design .....                                                                          | 6  |
| 3. Safety requirements .....                                                                     | 10 |
| 4. Installation of a turnstile .....                                                             | 11 |
| 4.1. Required equipment .....                                                                    | 11 |
| 4.2. Installation of turnstile .....                                                             | 12 |
| 5. Connecting turnstile .....                                                                    | 15 |
| 5.1. Power connection .....                                                                      | 19 |
| 5.2. Connecting Control Panel .....                                                              | 20 |
| 5.3. Connecting ACS (optionally) .....                                                           | 20 |
| Appendix 1. Summary of data bus CAN2.0 29 .....                                                  | 27 |
| Appendix 2. Location of installation holes related to external dimensions of the turnstile ..... | 28 |
| Appendix 3. Diagram of the turnstile and its connection .....                                    | 29 |

## List of abbreviations used

|            |                           |
|------------|---------------------------|
| PS         | – Power Supply            |
| SFAS       | – Security and Fire Alarm |
| RC         | – Remote Control Panel    |
| System ACS | – Access Control System   |
| NC         | – normally connected      |
| NO         | – normally opened         |

*Firmware version of turnstile FW Cube v 2.1*

## 1. Basic specifications

*Table 1. General Specifications*

| <b>Specification</b>                                                                  | <b>Turnstile</b>           | <b>Panel</b>         |
|---------------------------------------------------------------------------------------|----------------------------|----------------------|
| Overall dimensions(H x W x D), mm:<br>-in operating condition<br>-with fold down arms | 801x801x780<br>281x801x780 | 107x107x25           |
| Weight, kg                                                                            | 15                         | 0.5                  |
| Temperature range, °C:<br>-operation<br>-transportation and storage                   | +1...+40<br>+1...+40       | +1...+40<br>+1...+40 |
| Relative humidity, %, no more                                                         | 80                         | 80                   |
| Passage width, mm                                                                     | 500                        |                      |
| Throughput, person/min                                                                | 30                         |                      |
| Lifetime, years                                                                       | 8                          | 8                    |

*Table 2. Electrical characteristics*

| <b>Specification</b>                             | <b>Turnstile</b>    | <b>Panel</b>     |
|--------------------------------------------------|---------------------|------------------|
| Power supply voltage, V:<br>- rated<br>- working | 12.0<br>10.8...13.2 | 12.0<br>7.5...15 |
| Current type                                     | direct              |                  |
| Standby average current*, A                      | 0.4                 |                  |
| Average current in a pass mode*, A               | 0.4                 |                  |
| Maximum absorbed current, A                      | 1.5                 |                  |

\*- values indicated at rated voltage

\*\* *The manufacturer will reserve the right for changing configuration, technical specifications and appearance of the product without notice*

## 2. Product design

*Turnstile housing is made of:*

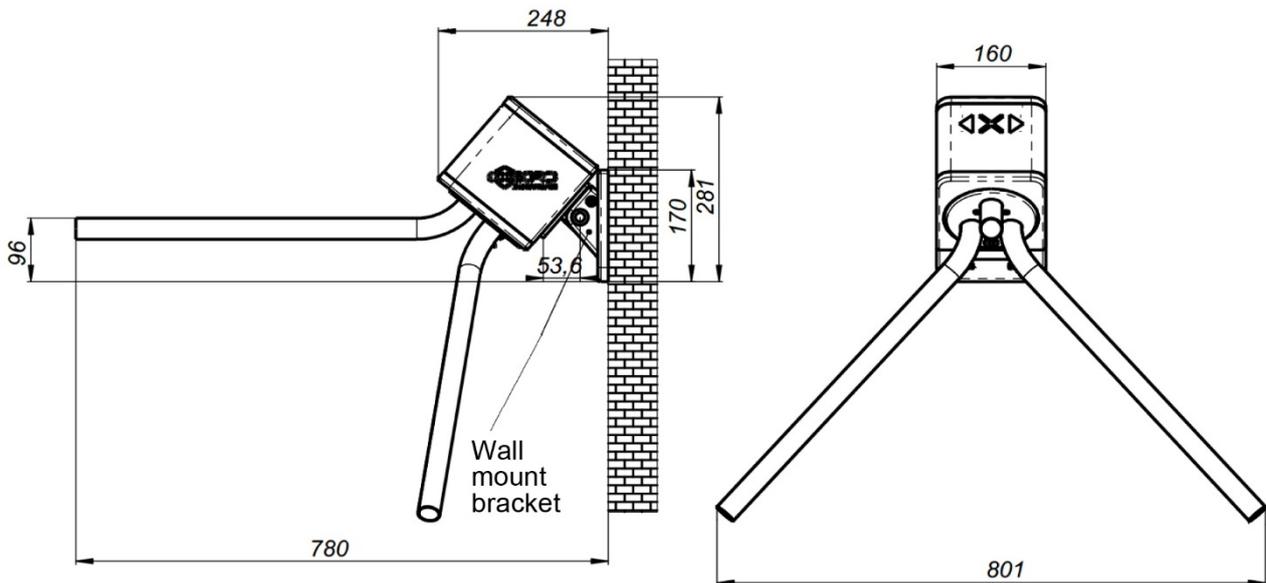
- blocking arms
- wall mount bracket

*Blocking arms:*

Housing and blocking arms are made of brushed stainless steel.

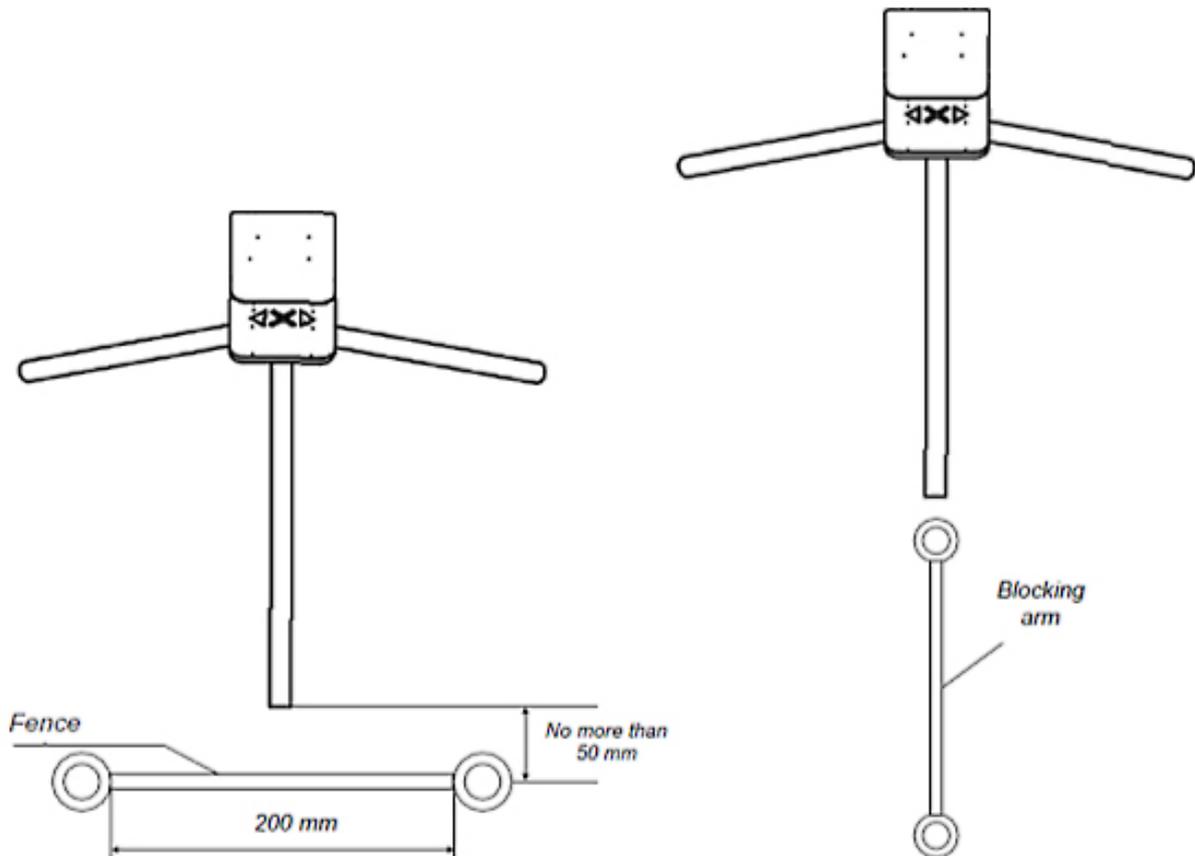
*Wall mount bracket:*

Wall mount bracket designated to secure arms block fixation to the turnstile installation sight. Arms block and bracket are connected with each other through the bolt.



*Fig. 1. General View and Overall Dimensions of Turnstile*

**ATTENTION!** To log passages during turnstile operation under ACS control and to avoid unauthorized passages, it is required to arrange passage zones as per Fig.2.



*Recommended installation diagram    Not recommended installation diagram*

*Fig 2. Arrangement of turnstile passage zone*

When installing the turnstile it is necessary to consider possible free movement of the arm, in the STOP mode it constitutes 6 degrees in each direction, Fig 3.

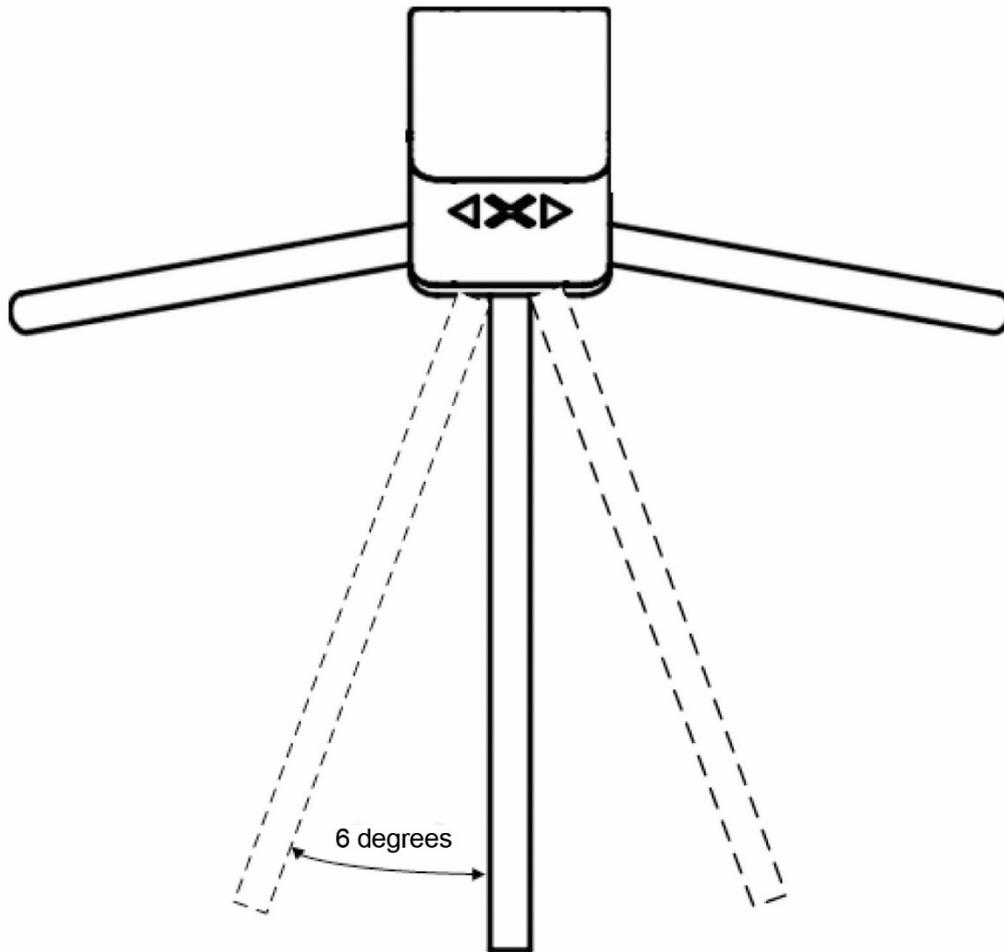
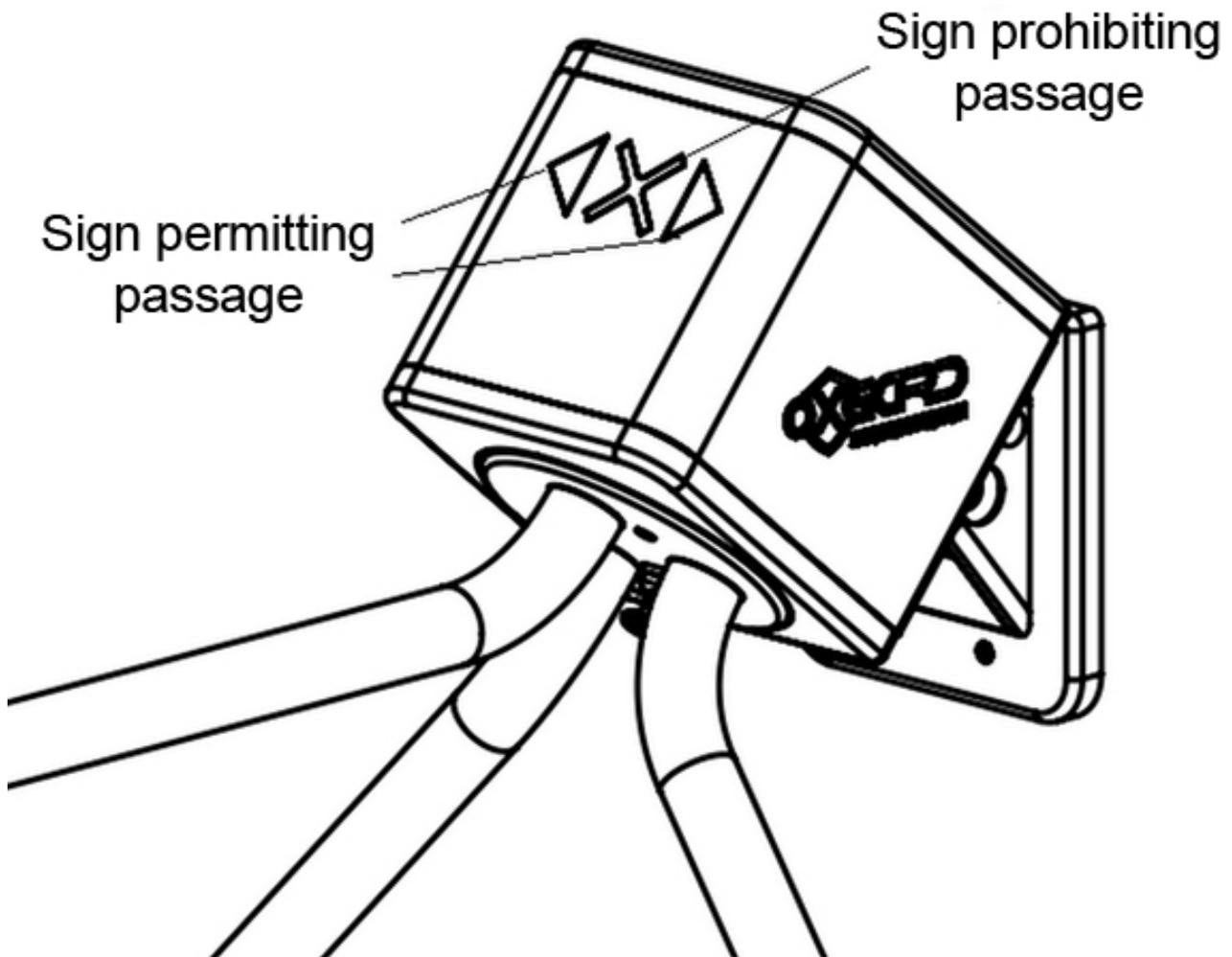


Fig. 3. Possible free movement of the arm, in “STOP” mode

***Indication panel***

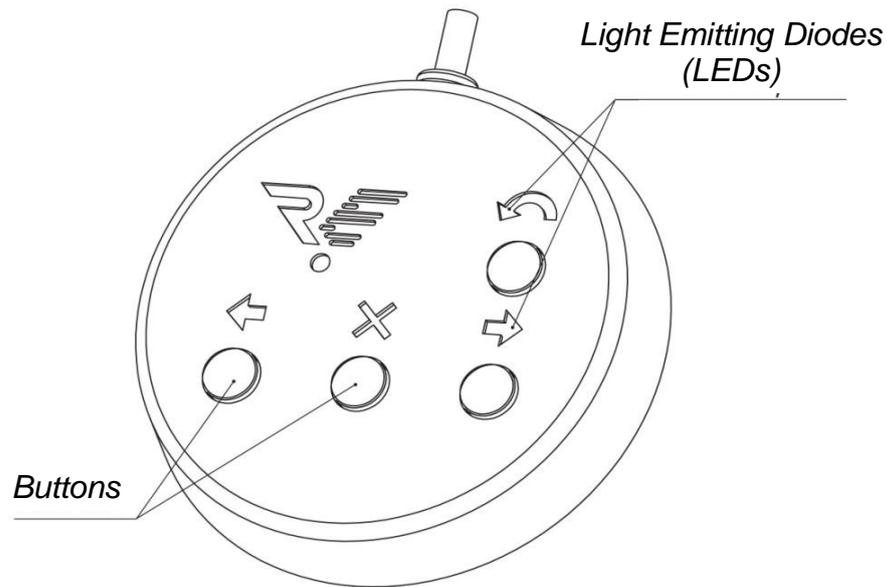
Indication panel of the turnstile is located at the upper part of the turnstile behind the insert made of acryl glass. Operation modes of the turnstile are displayed on the panel in form of mnemonic signs depicting authorization and non-authorization of passage (Fig.4).



*Fig. 4. Appearance of indication panel*

### ***Control panel***

Housing of remote control panel is made of brushed stainless steel. In the front there are control buttons and LEDs indicating operation modes of the panel (Fig.5). Standard cable length, included in the delivery set, is 5 meters



*Fig. 5. Appearance of control panel*

### 3. Safety requirements

**ATTENTION!** A failure to observe safety requirements, indicated in this Section, may cause damage to life and health of people, complete or partial loss of operating capability of the product and (or) auxiliary equipment.

**ATTENTION!** The manufacturer shall disclaim the liability for causing injury to human life and health complete or partial loss of operating capability of the product and (or) auxiliary equipment in case of a failure to observe safety requirements, indicated in this Section, and will terminate the validity of the product warranty.

#### **IT IS FORBIDDEN:**

- to install the turnstile outside dry and heated premises;
- to use pastes and liquids chemically aggressive to the materials of the body for cleaning purposes of the product.

## 4. Installation of a turnstile

**ATTENTION!** The turnstile should be installed securely to avoid swinging and (or) overthrow during operation. In case of installation on the low strength floors - take action to strengthen the floor at the installation site.

Before checking operability of the turnstile carefully read this section of the Guidelines.

### 4.1 Equipment required

Equipment used in the process of installation of the turnstile:

- electric drill;
- hard alloy drill 10 mm in diameter for drilling holes for anchors in the wall (recommended anchor MSA8 with the screw of DIN7991 M8x25);
- S5 internal hex wrench for screws;
- slotted screwdriver;
- plummet or leveling gauge;
- steel liners for turnstile aligning;
- side cutters.

## **4.2 Installation of turnstile**

Diagram of the turnstile and its connection is shown in the Appendix 3

**4.2.1** Prepare surface at the installation site of the turnstile.

**4.2.2** Open and unpack the box:

- Blocking arms unit
- Wall mount bracket
- PS with a cable

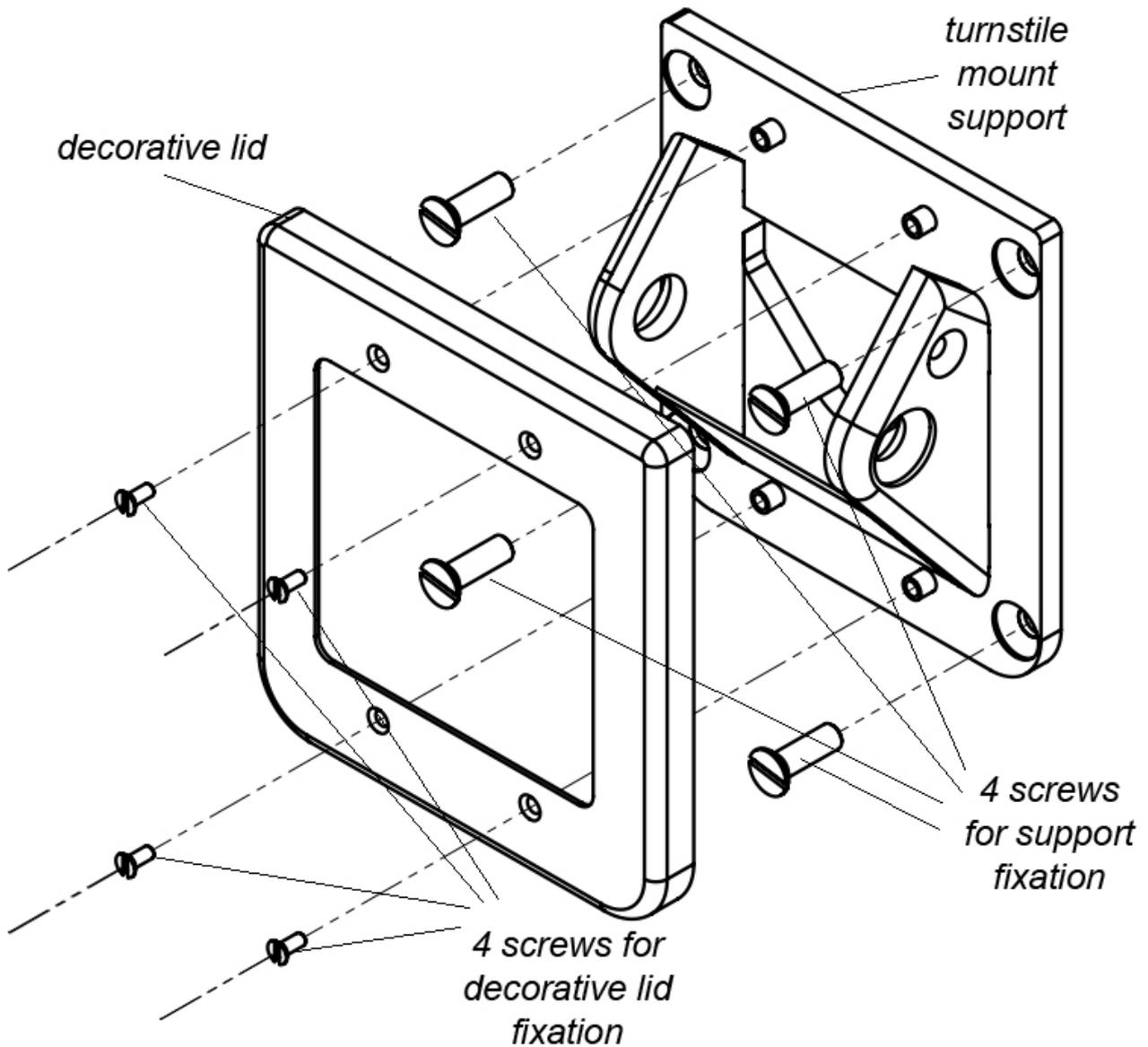
**4.2.3** Prepare cable conduit coming from the site to the installation area of PS, remote control panel, and as well, if it is required, to the connection point of ACS and SFAS.

**4.2.4** According to the setting dimensions (Fig.6), prepare 4 holes 10 mm in diameter in the wall for fixation anchors of the turnstile bracket (recommended anchor MSA8 with the screw of DIN7991 M8x25). Depth of the hole 35 mm should exceed the length of the anchor for more than 5mm. Insert the anchors in the holes and fix support for mount bracket with the screws M8x25 to the wall. With 4 screws fix decorative lid to the turnstile mount support as on the Fig.7. Fix the blocking arms unit to the mount support with the fastening sleeve and sleeve fixation screw.

Location of the installation holes related to external dimensions of the turnstile is presented in the Appendix 3 (Fig.16).

**4.2.5** PS and RC and, if provided, ACS and SFAS cable routing to the blocking arms unit is exercised through the hole located at the back turnstile side.





*Fig.7. Installation diagram of the turnstile bracket support*

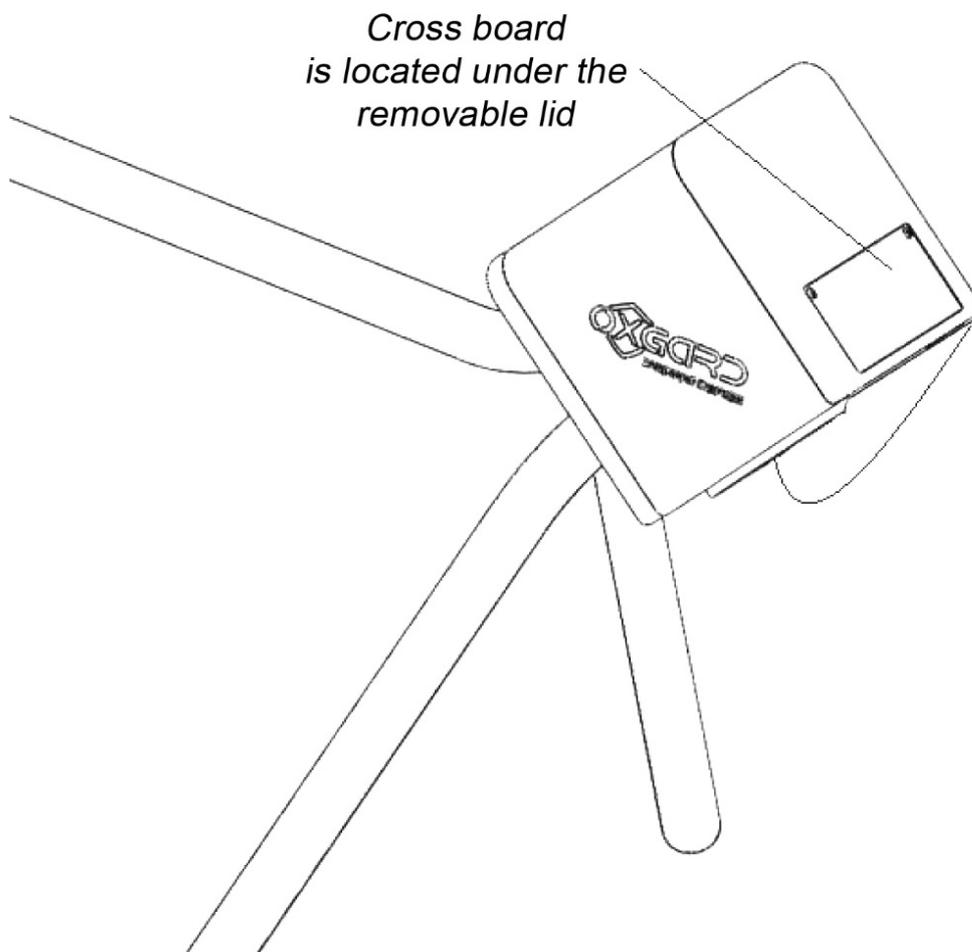
**4.2.6** Remove protective film from the turnstile housing.

## 5. Connecting turnstile

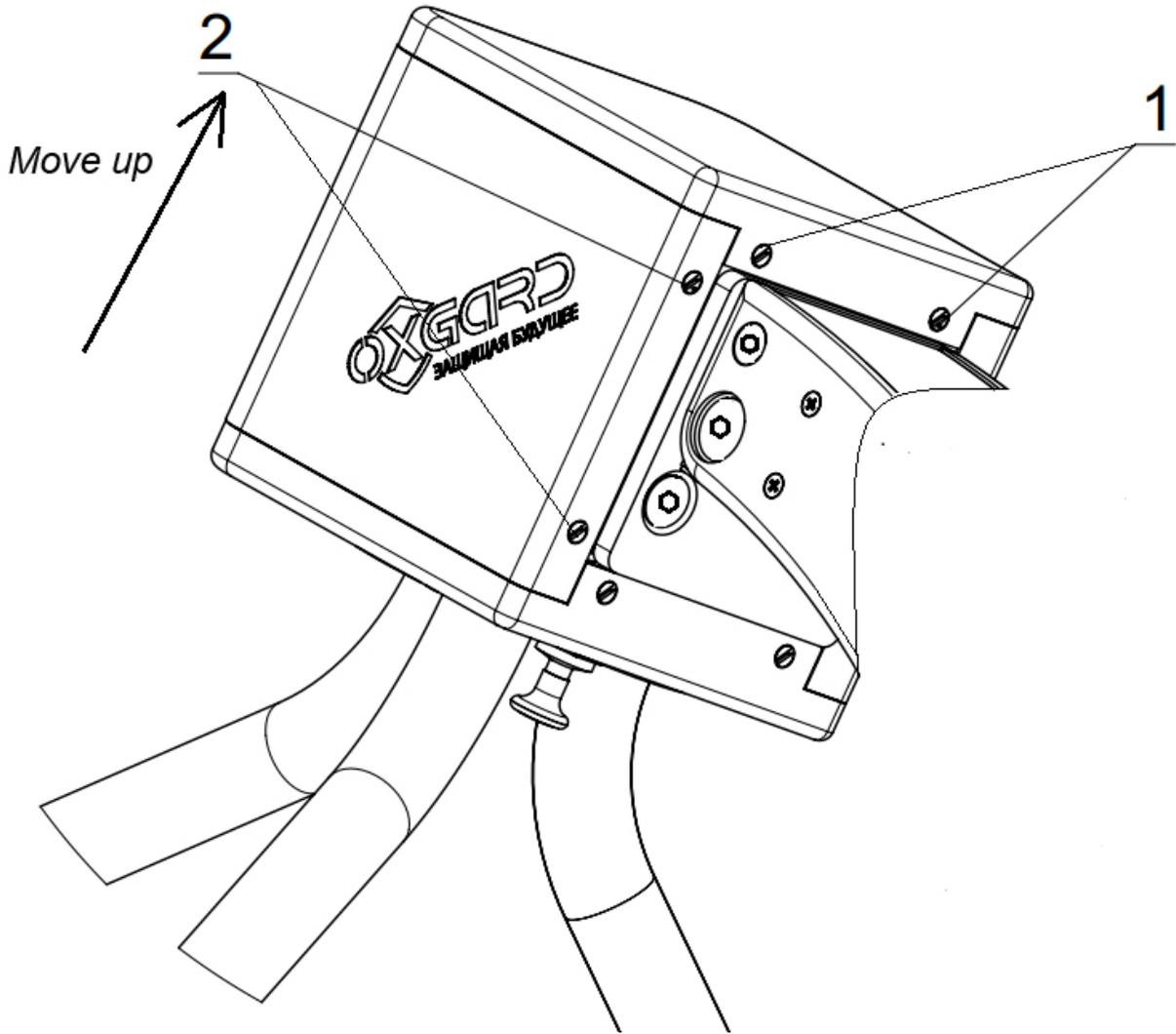
Connecting BP, PU, and access control is carried out with the help of a cross-board located in the block in barrier arms' unit, under the removable cover (Fig. 8).

For this it is required to undo 2 screws (1) and 4 screws (2), smoothly move the cover up on a short distance, without breaking the cable, connecting the display panel (Fig. 9). Disconnect the cable from the display board.

Slide the cover to the end and make free the access to a rotary mechanism. Fig. 10 shows the picture after removing of the cover

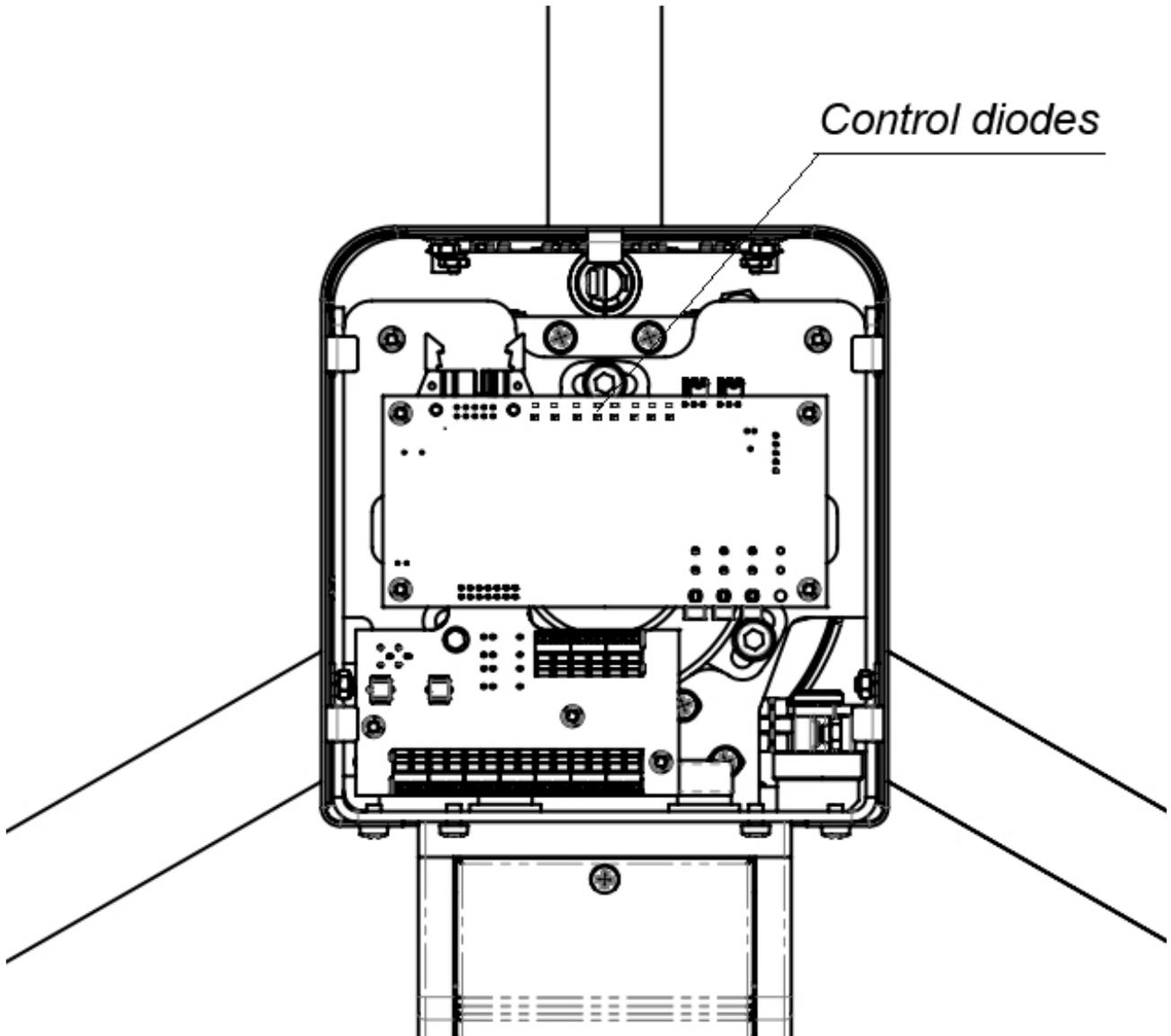


*Fig. 8. Cross-board arrangement*



*Fig. 9.*

To control connections to the cross board, a lid can be removed. For this, undo 2 M3 screws located on the lid and remove it by pressing your finger into the unit.



*Fig. 10.*

Fig.11 shows the cross-board arrangement and connectors for connecting BP, CP, ACS and OPS.

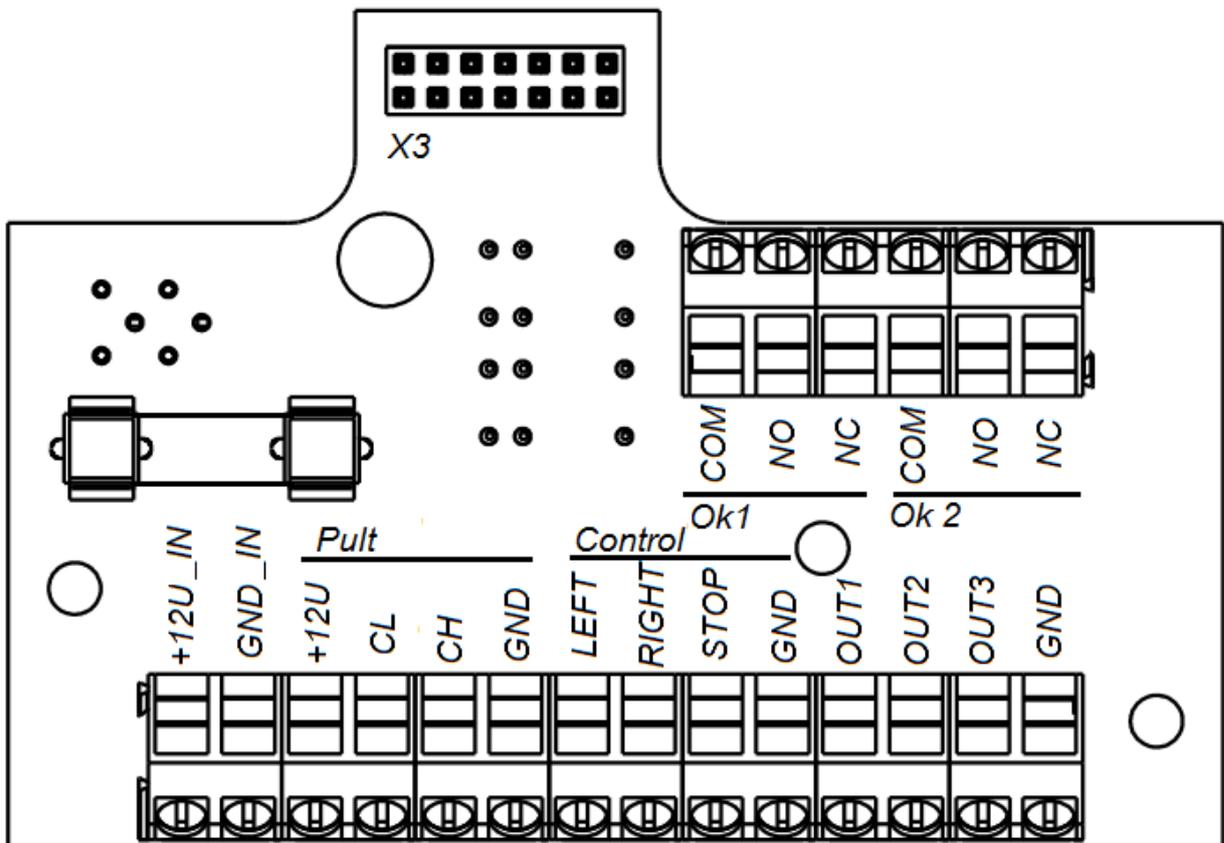


Fig.11. External View of the Cross-board

Table 3. Operation modes of a turnstile

| Jumper position |                   | Operating mode of the turnstile                                                                                             |
|-----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Potential Mode  | X1 Position «On»  | Potential mode (see i.5.3.)                                                                                                 |
|                 | X1 Position «OFF» | Pulse mode (see i.5.3.)                                                                                                     |
| Remote Control  | X3 Position «On»  | Turnstile does not react to the control panel instructions, button status translated to the outputs OUT1...OUT3 (see i.5.4) |
|                 | X3 Position «OFF» | Turnstile is controlled by the control panel, button status translated to the outputs OUT1...OUT3 (see paragraph 5.4)       |

## 5.1. Power connection

**ATTENTION!** It is prohibited to use power units with output current less than 1.5A.

It is not recommended to install a power unit at a distance more than 25 m off the turnstile.

**ATTENTION!** It is prohibited to connect turnstile power with a cable with cross-section less than  $1.5 \text{ mm}^2$ . When length of the feeding cable is more than 10 m it is recommended to use cable with dimensions equal to  $2.5 \text{ mm}^2$ .

The turnstile is powered by 12V DC voltage. Maximum current draw occurs in “Free passage mode” and constitutes – 1.5A. Power Supply Unit shall be selected on the basis of these ratings. Also take in consideration that with increase of the supplied cable length a voltage drop is increased (operating voltage range is given in Table 2).

Install PS at the place, free for an access of the operator. Connect PS cable to POWER group of the contacts +12U\_IN and GND\_IN located on the cross-board. The contacts (+) and (-) of PS to be connected to the contacts (12V\_IN) and (GND\_IN) correspondingly.

## 5.2. Connecting Control Panel

Remote control panel shall be connected to the Pult group of contacts located on the cross-board. The contacts will have to be marked as follows: 12V, CL, CH, GND.

Remote control panel connection shall be made on the basis of contact marking, provided in Table 4.

*Table 4. Contact marking for REMOTE CONTROL PANEL connection*

| <b>Contact marking</b> | <b>Colour of wire</b> |
|------------------------|-----------------------|
| 12V                    | Red                   |
| CL                     | Yellow                |
| CH                     | Green                 |
| GND                    | Blue                  |

## 5.3. Connecting ACS (optionally)

ACS Controller will have to be connected to the group of contacts:

Control located on the cross-board. The contacts will have to be marked as follows: LEFT, RIGHT, STOP, AP, GND. Contact assignment is indicated in Table 5.

*Table 5. ACS contact assignment*

| <b>Marking of contacts</b> | <b>Contact assignment</b>                                       |
|----------------------------|-----------------------------------------------------------------|
| LEFT, RIGHT                | One-pass movement to the left/to the right<br>(lowest priority) |
| STOP                       | No Entry (“Stop” mode)<br>(medium priority)                     |
| GND                        | Common contact                                                  |

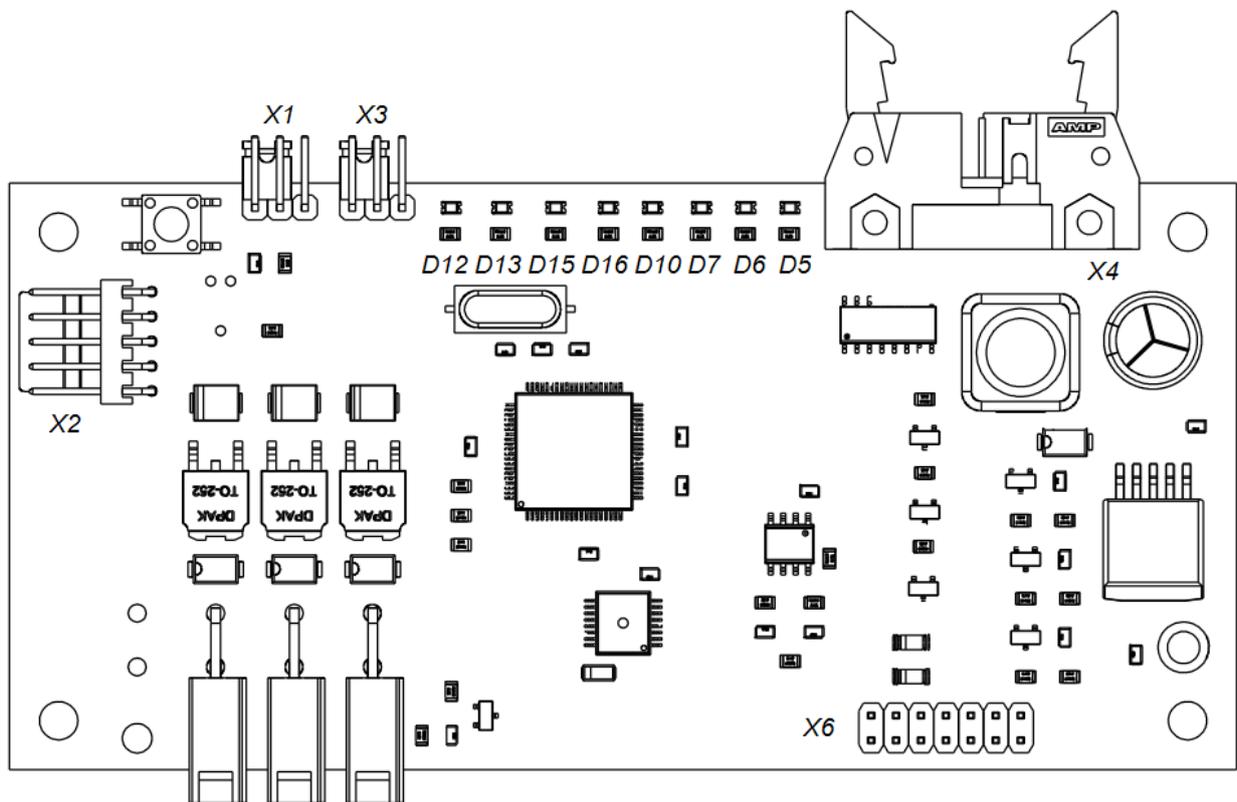
Inputs for ACS connection will have to be identified by means of priorities:

- AP input possesses the highest priority. At GND contact of this input the turnstile is in antipanic mode and DOES NOT REACT (!!!) to the other signals; on the indication panel both arrows “to the left” and “to the right” are flashing.
- Input STOP possesses medium priority. At GND contact of this input the turnstile changes over to a “Stop” mode and does not react to the other influences, except for AP;
- LEFT and RIGHT possesses equally low priority and include one pass to one or another side. If both inputs are closed, the pass will be allowed to the side which input closed first. In case the pass fails to be done the turnstile will automatically change over to “Stop” mode 5 seconds later.

ATTENTION (!) In case of one of STOP inputs are closed, the instructions coming from the control panel will not be received as ACS has the higher priority.

STOP input is a potential one, i.e. until the input is at GND contact, the turnstile is operating in the corresponding mode, after the contacts are opened the turnstile changes over to “Stop” mode irrespective of what mode has been until ACS activated.

Inputs LEFT and RIGHT are able to operate both in potential and pulse mode (actuation by the fact of GND contact). Pulse mode is installed by default.



*Fig.12. Motherboard of the turnstile*

To change over to potential operation mode it is required to install jumper X1 (Potential mode) on the motherboard in the position «ON» (Fig.12). In this case the passage mode to the left/to the right is switched on only for delivery time of the control signal to the inputs LEFT/RIGHT. Free passage mode one can set by control signal supply to both of the inputs simultaneously. The priority of the inputs LEFT and RIGHT while changing over to a pulse mode will remain unchanged. On the cross-board there are two relay outputs for AMCS, operating under the principle of “dry contact” – Ok1 and Ok2. NO and COMM is normally closed connection. Actuation of one of the contact group testifies of a passage fulfilment to the appropriate side (Ok1–to the right, Ok2–to the left). “Dry contact” is closed/opened when the arm turns

through 60 grades and turns back to the initial position after complete passage fulfillment.

To check the operation of the motherboard, there are mounted Light Emitting Diodes (LED). To check their operation, it's necessary to remove the cover (Fig.10). Fig. 12 shows the arrangement of the LED D5 that indicates a signal to the input "LEFT".

D6 that indicates a signal to the input "RIGHT".

D7 indicates a signal to the input "STOP".

D10 indicates a passage fulfillment to the right and relay activation (Ok-1 to the right).

D16 indicates a passage fulfillment to the left and relay activation (Ok-2 to the left).

D15 indicates powering 12V of the motherboard.

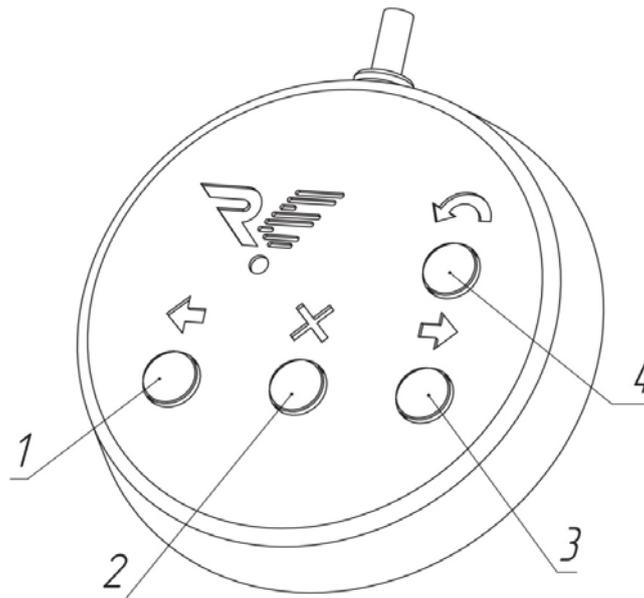
D12 EnDec and D13 EncInc indicate the right arrangement of the magnet relative to the barrier arms position magnetic sensor. Located right D12 and D13 are not lightened.

#### ***5.4. Connecting control panel to ACS controller***

In some cases remote control panel must be connected directly to ACS controller, as the passages, permitted by control panel (without controller), are regarded by the system as "forced entry".

To use this turnstile connection scheme it is required to install a jumper X3 (Remote Control) to the motherboard in position «On» (Fig.12). With X3 jumper installed the turnstile does not react to the signals coming from the control panel but transmits their state to the contacts of the terminals

OUT1... OUT3 of the crossboard (Fig.11), which are the outputs with bare collector. Contact assignment is represented in Table 6, numbering of the control panel buttons is shown on Fig.13. For this group of contacts maximum output current does not exceed 150 mA, permissible voltage is no more than 24 V.



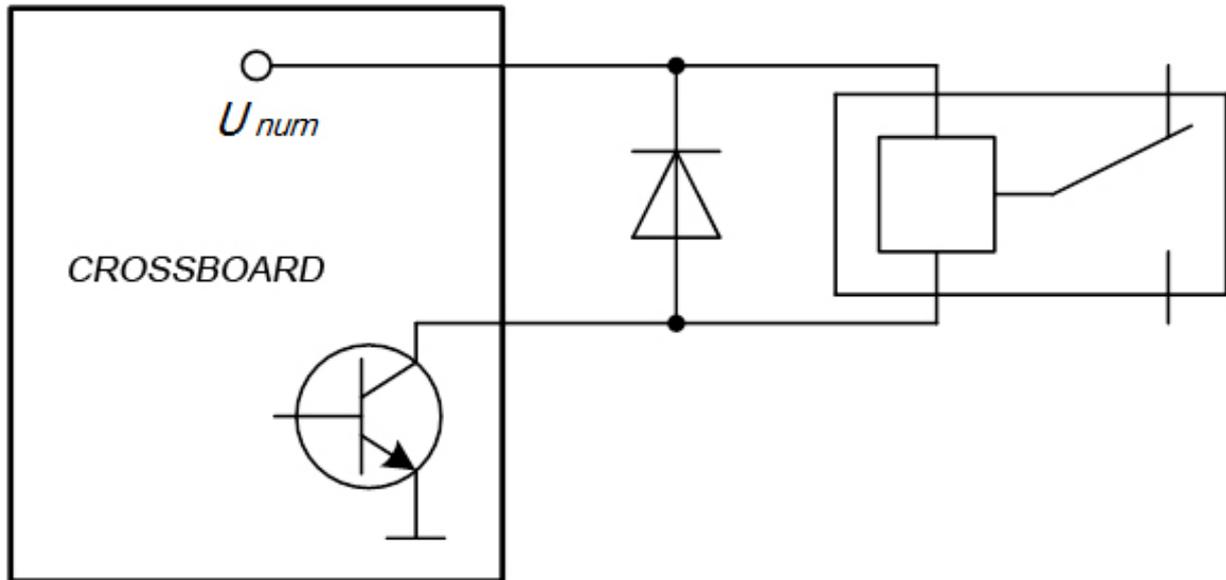
*Fig. 13. Numbering of control panel buttons*

*Table 6. Assignment of OUT contact group*

| <b>Contact marking</b> | <b>Assignment of contacts</b>        |
|------------------------|--------------------------------------|
| OUT1                   | Status of “Left” button (1, Fig 13)  |
| OUT2                   | Status of “Right” button (3, Fig.13) |
| OUT3                   | Status of “Stop” button (2, Fig.13)  |

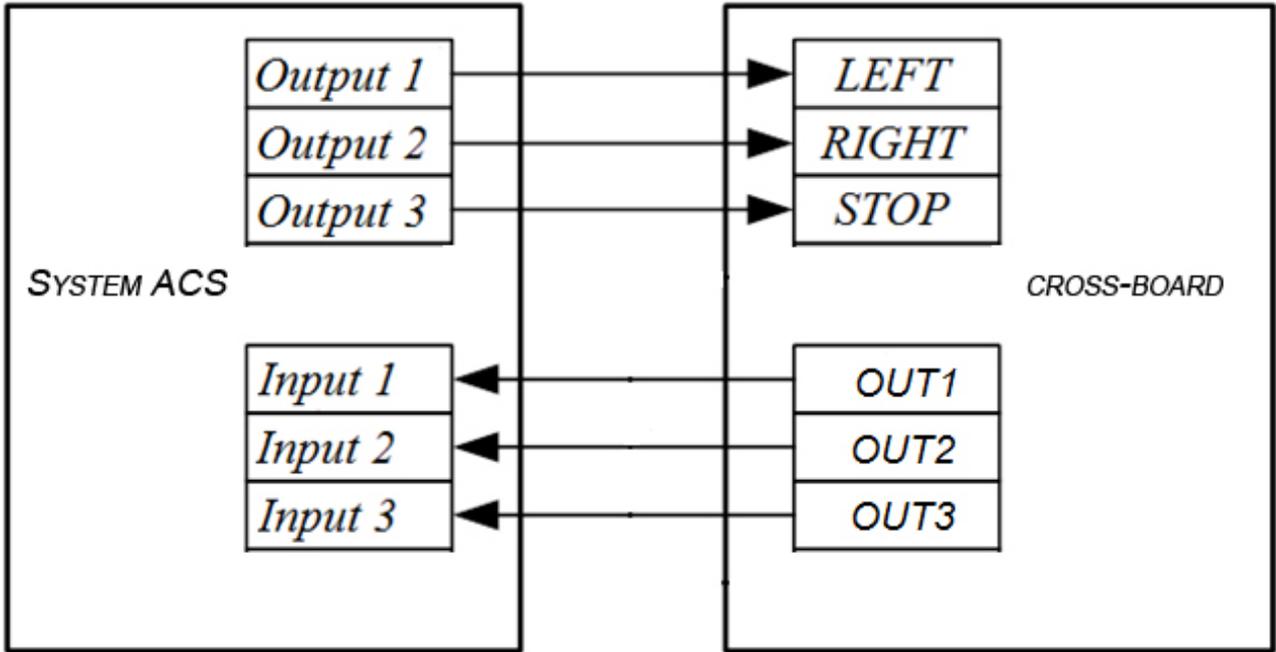
Outputs OUT1... OUT3 display current status of remote control panel buttons, i.e. the transistor opens when the appropriate button is pressed.

Outputs OUT1... OUT3 one can connect to AMCS controller both directly and via relay. When using relay the diode connection in parallel to the winding is **mandatory (!)** (Fig. 14).



*Fig.14. Connection diagram of diode connected in parallel to relay winding*

Connecting diagram of remote control panel to ACS controller is shown on Fig.15. In this option the controller controls the turnstile with the contacts “Left”, “Right” and “Stop”, with “Antipanic” contact connection and disconnection via the control panel. An important feature of remote control panel connection via ACS controller is impossibility of using turnstile modes which are set with button combinations pressed on the control panel (except for free passage mode at potential control mode, see Section 5.3 of the Instruction). In this particular case ACS is responsible for these modes.



*Fig. 15. Connecting diagram of control panel to ACS controller*

## **Appendix 1. Summary of data bus CAN2.0**

Remote control panel uses a modern jam-resistant bus of standard CAN2.0. According to the standard CAN2.0 a length of signal cable can reach the values more than one kilometer, however correct operation at such distances depends on many factors. At the distances more than 25 meters – it must be used twisted pair Cat5e or Cat6. Total electrical resistance for power wire of the remote control panel for direct current shall not exceed 50 Ohm. If this requirement is unable to comply with one can install additional PS for 12V/100mA (minimal operating supply voltage of remote control panel – 7.5V). At that for correct operation 3 wires coming from turnstile CL, CH, GND are sufficient. Two control panels may be connected to one turnstile.

An important feature of CAN 2.0 bus is the availability of 120 Ohm resistor at the bus ends. Such resistor has already been installed in the standard remote control panel.

## Appendix 2. Location of installation holes related to external dimensions of the turnstile

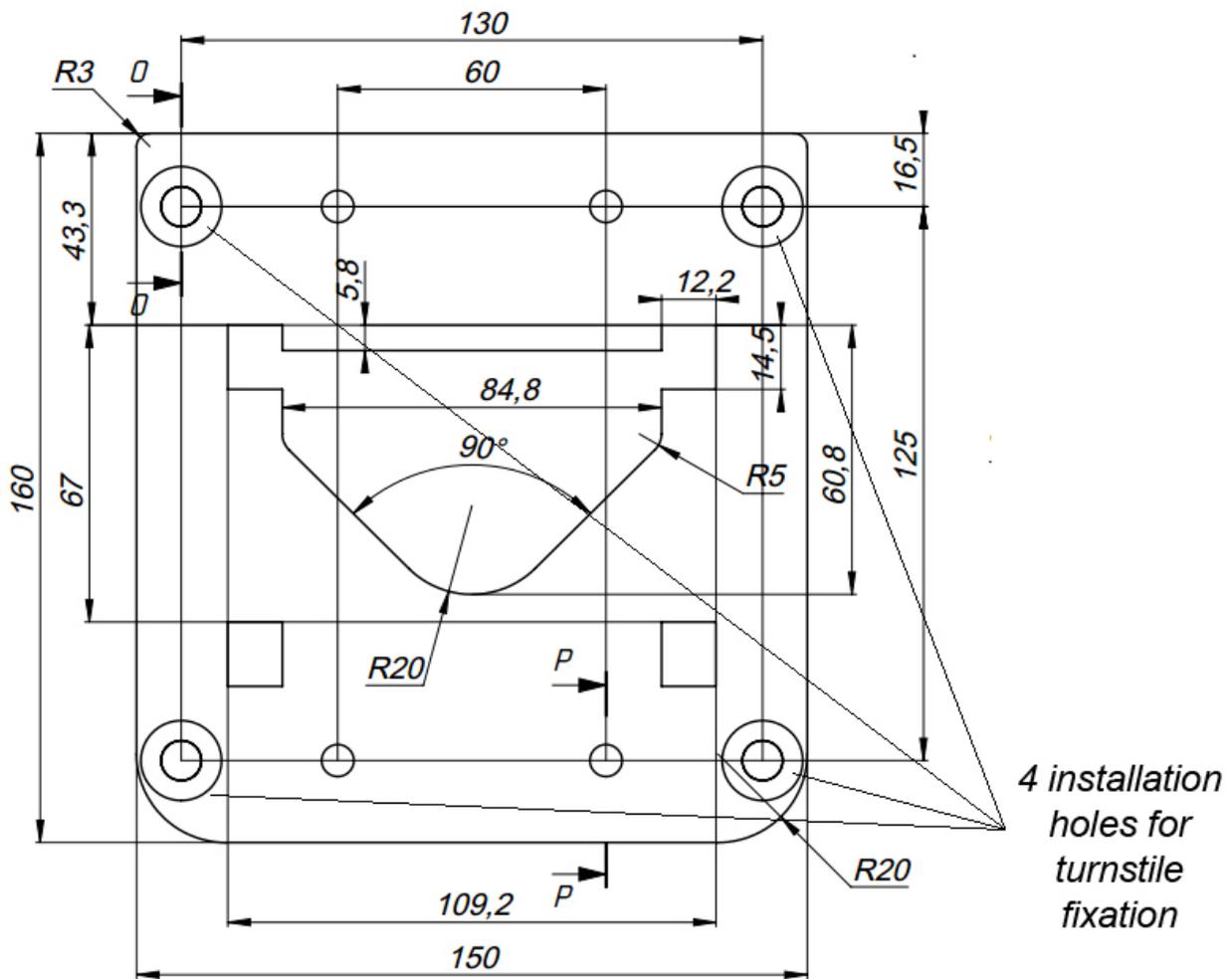


Fig.16. Location of installation holes for turnstile fixation









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