



Waist-high Rotor Turnstile

**RTD-03S**

OPERATION MANUAL



CE



# **Waist-high Rotor Turnstile**

***RTD-03S***

**Operation manual**

# CONTENTS

1	APPLICATION.....	3
2	OPERATION CONDITIONS.....	3
3	TECHNICAL SPECIFICATIONS .....	4
4	DELIVERY SET .....	5
4.1	Standard delivery set .....	5
4.2	Optional equipment supplied on request.....	5
5	BRIEF DESCRIPTION .....	6
5.1	Main features .....	6
5.2	Design.....	6
5.3	Control over the turnstile .....	10
5.3.1	Control with the remote control panel .....	10
5.3.2	Operation from the ACS via the CU «ACS» connector .....	10
5.4	General requirements for indicators connection to the turnstile .....	12
5.5	Mechanical unblocking of the turnstile .....	13
6	MARKING AND PACKAGING.....	14
7	SAFETY REQUIREMENTS.....	14
7.1	Installation safety requirements .....	14
7.2	Operation safety requirements.....	14
8	INSTALLATION INSTRUCTIONS .....	15
8.1	General Recommendations .....	15
8.2	Tools and equipment required for installation .....	15
8.3	Installation procedure.....	15
9	OPERATION INSTRUCTIONS .....	18
9.1	Power-up .....	18
9.2	Operating modes .....	18
9.3	Operation from the built-in SPS .....	21
9.4	Operation from the external power supply .....	22
9.5	Troubleshooting .....	22
10	MAINTENANCE .....	23
11	TRANSPORTATION AND STORAGE .....	23
	Appendix 1 Processor module.....	24
	Appendix 2 Electrical connection layout .....	25
	Appendix 3 Guide barriers set versions for RTD-03S turnstile .....	26

## ***Dear customer!***

*We thank You for choosing the turnstile manufactured by PERCo.  
You have purchased the high quality product, which will be long lasting  
in operation provided that installation and operation rules are observed.*

The operation manual for RTD-03S waist-high rotor turnstile contains data that is necessary for the most full usage of operating advantages of the turnstile as well as chapters on packaging, installation and maintenance.

Only qualified personnel, following the instructions of this Manual, must carry out installation and maintenance.

Abbreviations and terms used in this Manual:

- ACS – access control system;
- CU – control unit;
- RC – remote control panel;
- SPS – standby power supply.

## **1 APPLICATION**

The turnstile is designed for managing pedestrian flows at entrance checkpoints of industrial facilities, banks, administrative buildings, retail outlets, railway terminals, airports, etc.

To ensure fast and convenient passage it is recommended to install one turnstile per every 500 people, working in the same shift, or on the basis of maximum working load 23 persons/min.

## **2 OPERATION CONDITIONS**

The turnstile post, in accordance with the resistance to environmental exposure, is compliant with GOST 15150-69, category U4 (operation in premises with climate control).

Operation of the turnstile post is allowed at ambient temperature between +1°C and +45°C and relative air humidity up to 98% at +35°C.

The control unit, in accordance with the resistance to environmental exposure, is compliant with GOST 15150-69, category NF4 (operation in premises with climate control).

Operation of the control unit is allowed at ambient temperature between +1°C and +40°C and relative air humidity up to 80% at +25°C.

### 3 TECHNICAL SPECIFICATIONS

AC operating voltage .....	220 ± 22 V AC / 50 ± 1 Hz
Power consumption .....	max 60 W
Turnstile post input DC voltage .....	max 36 V
External power supply input DC voltage .....	24÷27 V
Throughput in the single passage mode .....	23 persons/min
Throughput in the free passage mode .....	30 persons/min
Passageway width .....	600 mm
Operation time from the built-in SPS .....	min 1.5 hr
Number of passages when operating from the built-in SPS.....	min 1200 passages
Rotor rotation force (at the center of the barrier wing) .....	max 1.5 kgf
Mean time to failure .....	min 1000000 passages
Mean lifetime .....	min 8 years
Turnstile overall dimensions, see Fig. 1, (length × width × height) ....	1202×1202×1013 mm
Net weight of the turnstile post.....	max 43 kg
Control unit overall dimensions (length × width × height) .....	295×290×76 mm
Net weight of the control unit .....	max 8.7 kg
Remote control panel overall dimensions (length × width × height).....	121×80×20 mm
Net weight of the remote control panel .....	max 0.35 kg
Electric shock protection class:	
Control unit .....	I according to GOST R IEC 335-1-94
Turnstile post.....	III according to GOST R IEC 335-1-94
Ingress Protection Rating:	
Control unit .....	IP40 under EN 60525
Turnstile post.....	IP41 under EN 60525

## 4 DELIVERY SET

### 4.1 Standard delivery set

#### Basic equipment:

Turnstile post assembled .....	1
Barrier wing with fastenings.....	4
Filler panel.....	4
Control unit CU-05.2 with 1.5 m power cable. ....	1
Remote control panel with cable 6.6 m* long .....	1
Control cable (4 m*).....	1
Power cable (4 m*) .....	1
Mechanical release key .....	2

#### Operational documentation:

Assembly and Operation Manual .....	1
Certificate .....	1

#### Spare parts:

ACS connector DBH 15F cable socket (to connect the ACS) .....	1
H9 connector case (for DBH-15F) .....	1
XLR3 cable socket for external power supply connection .....	1
Fuse 1 A (5×20 mm).....	1
Fuse 2 A (5×20 mm).....	1

#### Installation tools:

Plastic dowel .....	3
Screw 4×20 .....	3
Hex-nut wrench S5.....	1

#### Package:

Box .....	1
-----------	---

### 4.2 Optional equipment supplied on request

Passive infrared sensor of intrusion detector .....	1
Siren (for alerts on unauthorized entry attempts).....	1
Anchor PFG IH 10 with M10 bolts.....	3
Hex-nut wrench S8 (for M10 bolts) .....	1
Guide barriers set (see Appendix 3 of RTD-03S Operation manual) .....	1
Wireless remote control kit.....	1



#### Note

Wireless remote control kit consists of a receiver and 2 transmitters (tags) with operation range up to 40 m.

\* Maximum allowable cable length is 30 m

## 5 BRIEF DESCRIPTION

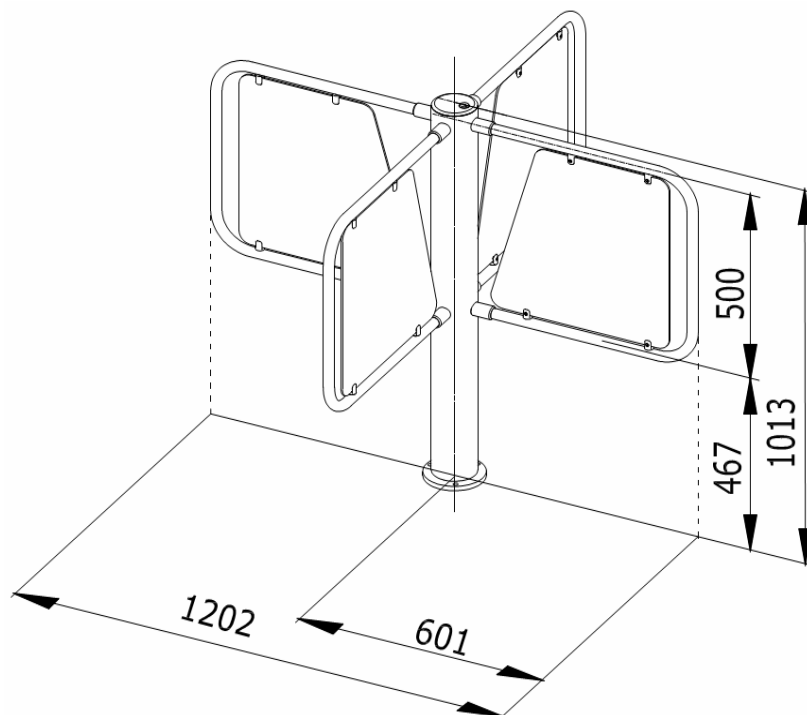
### 5.1 Main features

- The turnstile can be operated autonomously from the remote control panel or wireless remote control, as well as from the ACS.
- The turnstile post is supplied with the safe voltage – not more than 36 V.
- The turnstile has low power consumption – not more than 60 W.
- The built-in SPS, containing 2 sealed lead-acid 12 V batteries, ensures uninterrupted operation of the turnstile for up to 1.5 hours (1200 passages) at the AC mains failure. At the AC mains restoring the batteries are recharged automatically.
- The turnstile is a normally closed device (it remains in the “Closed” position at power switching off).
- The electric drive ensures automatic reset of the barrier wings to home position after each passage.
- The mechanical lock is built in the turnstile post and ensures the turnstile unblocking with a key in emergency cases (free rotation of the barrier wings).
- The barrier wing rotation sensors are built in the turnstile post base and ensure accurate count inputs to the ACS.
- There are two variants of the turnstile control from the ACS – pulse and potential.
- The external turnstile components, except for filler panels, are made of polished stainless steel.
- The filler panels are made of prestressed glass or polycarbonate plastic.

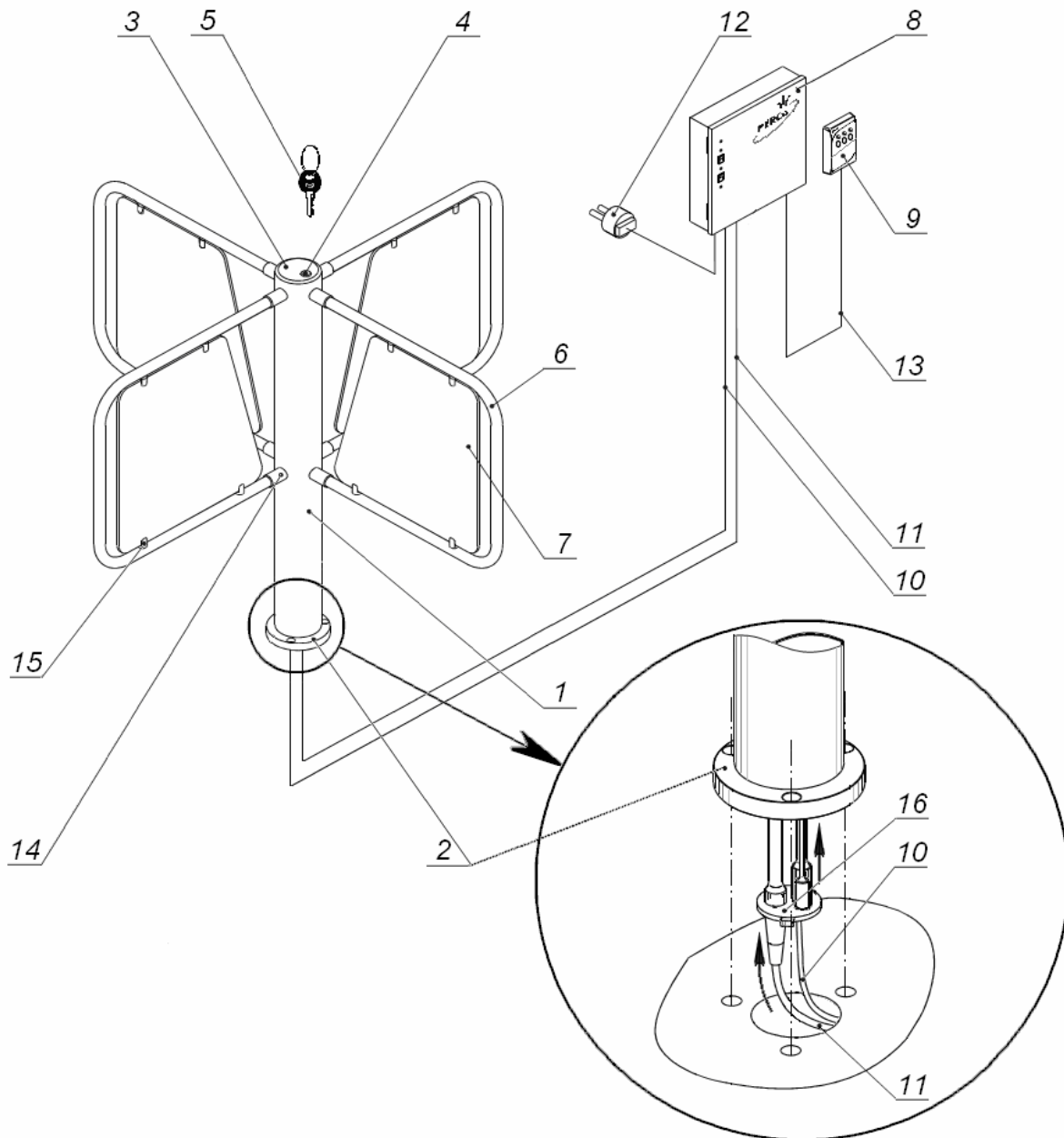
### 5.2 Design

The turnstile overall dimensions are given in Fig. 1.

The design of the turnstile is shown in Fig. 2. Numbers in brackets correspond to Fig. 2.



**Figure 1 Dimensions of the RTD-03S waist-high rotor turnstile**



**Figure 2 RTD-03S waist-high rotor turnstile overall view**

- 1 – rotary post; 2 – post with flange; 3 – cover; 4 – mechanical release lock;  
 5 – mechanical release key; 6 – barrier wing; 7 – filler panel; 8 – control unit;  
 9 – remote control panel; 10 – control cable; 11 – power cable;  
 12 – AC power cable; 13 – remote control cable; 14 – coupling fitting;  
 15 – filler panel fastening; 16 – cable connectors block

5.2.1 The turnstile consists of the turnstile post with barrier wings, the control unit (8) and the remote control panel (9), connected to the turnstile post with the power cable (11) and the control cable (10) via the cable connectors block (16).

The turnstile post is supplied assembled and consists of the post with flange (2) and the rotary post (1). Four barrier wings (6) are mounted on the rotary post (1). The filler panels (7) are set into the barrier wings (6) with the fastenings (15). On the rotary post (1) cover (3) there is the mechanical release lock (4).

The turnstile post with flange (2) is fastened to the floor with the M10x70 screws with recessed hexahedron.



In the turnstile post with flange (2) there are the electric drive, the locking devices, the optic barrier wing rotation sensors, the bearing units, the power module and the cable connectors block (16).

To form the passageway it is possible to use several variants of guide barriers set (see Appendix 3).

5.2.2 The remote control panel (RC) (9) is designed in the form of a small desktop device with a shockproof ABS plastic case and is intended for setting and indication of the operating modes when the turnstile is operated manually. The remote control panel (9) is connected to the processor module inside the control unit (8) with a multi-thread floppy tape (13) via a cable inlet on the lower panel of the control unit (Fig. 3 and Fig. 9).

There are three control buttons on the RC front panel, which are intended for setting the turnstile operating modes. The LED indicators are located above the buttons. The button in the middle (hereinafter – the **STOP** button) is intended to set the turnstile to the “Always locked” mode. The left and the right buttons are intended to unblock the turnstile for passage in the chosen direction. If the turnstile post installation is not standard (e.g. the operator’s terminal is placed at the backside of the turnstile post and not at the front side), the RC orientation towards the turnstile post can be changed (ref. Note 2 to Table 2).

The RC is equipped with a buzzer for audio signal generation.

5.2.3 The control unit (CU) (8) (see Fig. 2, 3) is intended for the turnstile units powering and control. It comes as a standalone unit in a metal case with the pull-resistant fasteners for wall mounting. The CU can also be desk-mounted.

The CU case contains the power transformer, the DC power supplies module, the processor module and two 12V SPS batteries.

The CU front panel (Fig. 3) contains:

- **"Power"** toggle switch (On/Off) — AC mains power-up;
- **"Battery"** toggle switch (External/Internal) — connection of the built-in SPS/external power supply;

and the following LED indicators:

- **"Power"** – AC mains on (green);
- **"24V"** – 24V DC power supply (green);
- **"Battery"** – the CU changeover to the built-in SPS (red);
- **"24V/2A"** – 24V/2A fuse failure (red).

The CU lower panel contains:

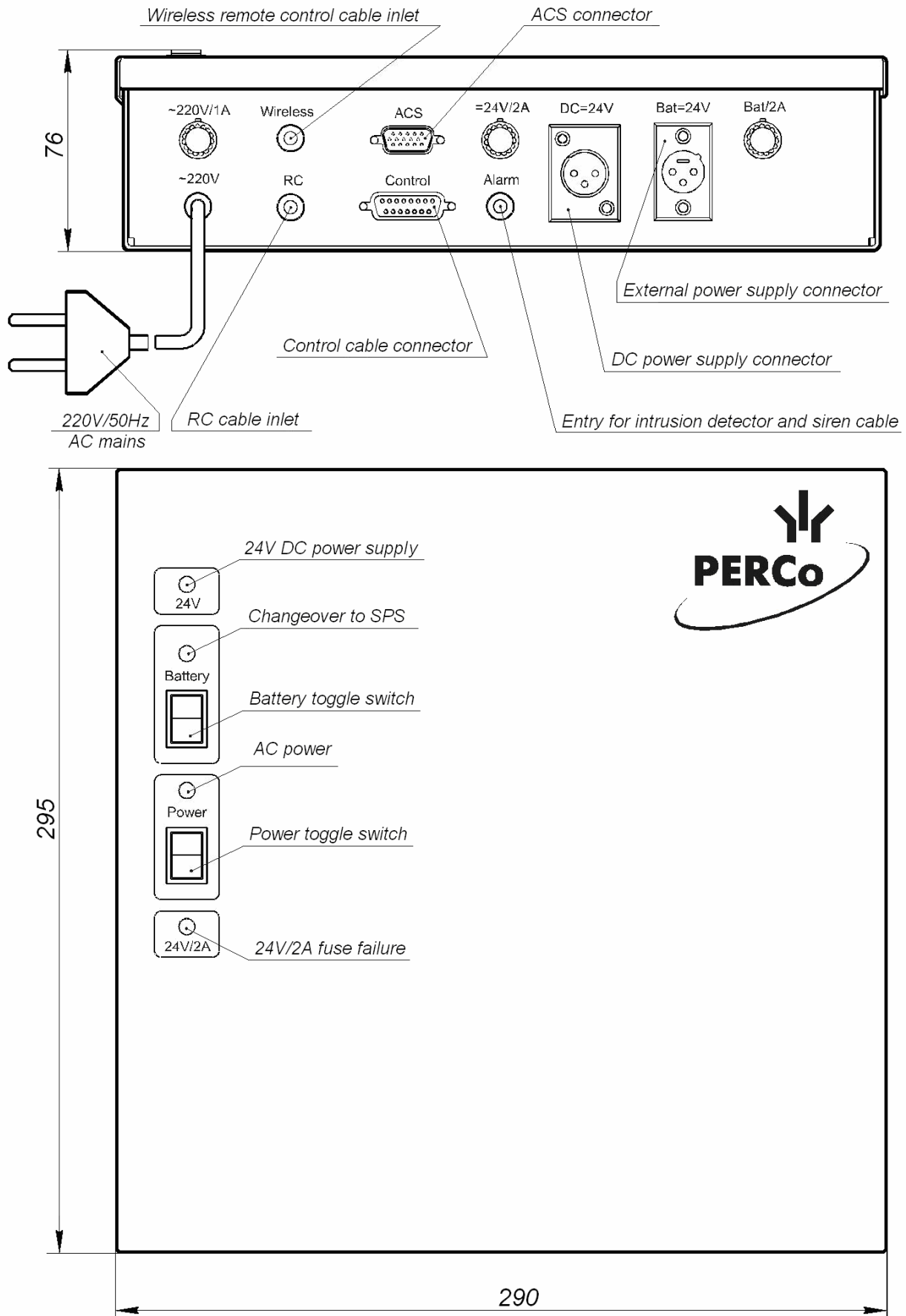
- fuse slot with the “~220V/1A” fuse;
- **“Bat/2A”** fuse slot\*;



**Warning!**

To avoid accidental power-up of SPS, “Bat/2A” fuse is not installed and is provided together with the set of spare parts.

- fuse slot with the “=24V/2A” fuse;
- RC cable inlet – **“RC”**;
- Wireless remote control cable inlet – **“Wireless”**;
- ACS connector – **“ACS”**;
- Control cable connector – **“Control”**;
- Power cable connector – **“DC=24V”**;
- External DC power supply connector – **“Bat = 24V”**;
- AC power cable input – **“~220V”**;
- Entry for intrusion detector and siren cables – **“Alarm”**.



**Figure 3 Control unit**

Connections for intrusion detector and siren are given in Fig. 9 (Appendix 1).

### 5.3 Control over the turnstile

The turnstile can be operated:

- from the RC;
- from the tag of the wireless remote control kit;
- from the ACS.

#### 5.3.1 Control with the remote control panel

The following operating modes can be set from the RC (see Table 2):

- always locked;
- single passage in the set direction;
- bidirectional single passage;
- free passage in the set direction;
- free passage in the set direction and single passage in the opposite direction;
- always free.

The turnstile control with the tag of the wireless remote control kit is similar to the control with the RC. Instruction for connection and operation of the wireless remote control kit is included in its delivery set. Connection layout for the wireless remote control is given in Figure 9 Appendix 1.

#### 5.3.2 Operation from the ACS via the CU «ACS» connector

The ACS is connected to the CU «ACS» terminal with a cable (see Fig. 3). The «ACS» connector pins assignment is shown in Fig. 4. The ACS connector (DBH15-F cable socket) is included in the set of spare parts.

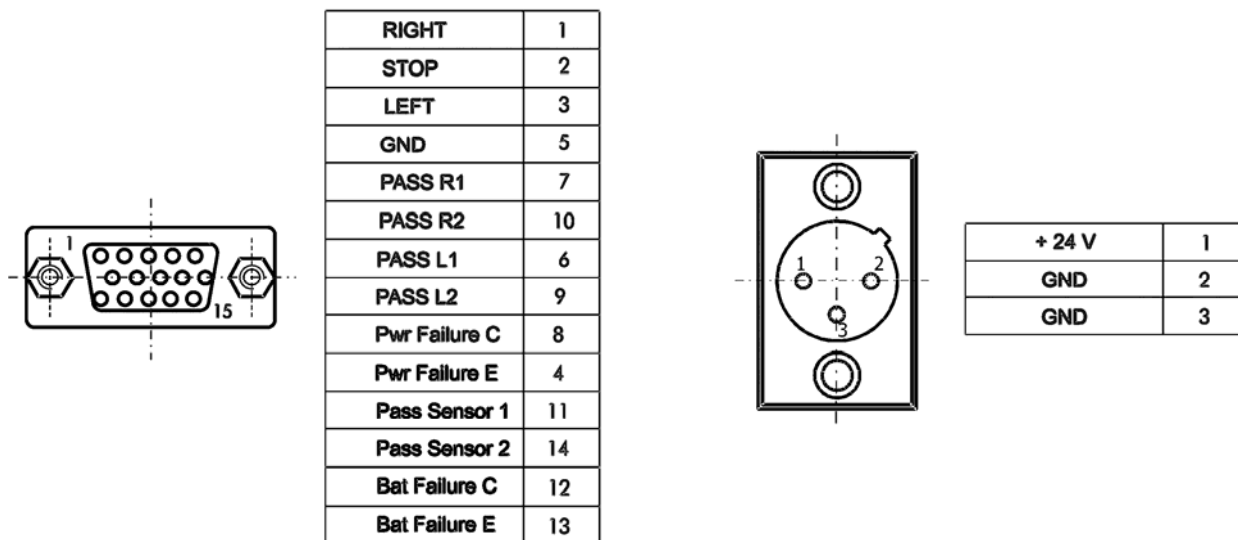


Figure 4 Control unit connectors

There are 2 variants of the turnstile control:

- **Pulse control** — the turnstile is operated by input of a low-level signal or by closing the contacts «**RIGHT**», «**STOP**», «**LEFT**» and «**GND**» (**GROUND**) of the ACS connector. The control signal duration is not less than 100 ms;;
- **Potential control** — the turnstile is operated by input of a low-level signal or by closing the contacts «**RIGHT**», «**LEFT**» and «**GND**» (**GROUND**). The set passage mode can be cancelled by removal of a low-level signal or by breaking the contacts «**RIGHT**», «**LEFT**» and «**GND**» (**GROUND**) of the «**ACS**» connector. The «**STOP**» contact of the «**ACS**» connector is not used.

The control variant is set by the jumper on the X5 connector of the processor module (see Fig. 9 Appendix 1). If the jumper is fixed – pulse control, the jumper is not fixed – potential control.

The control unit is supplied with pulse control mode preset (the jumper of the X5 connector is set).

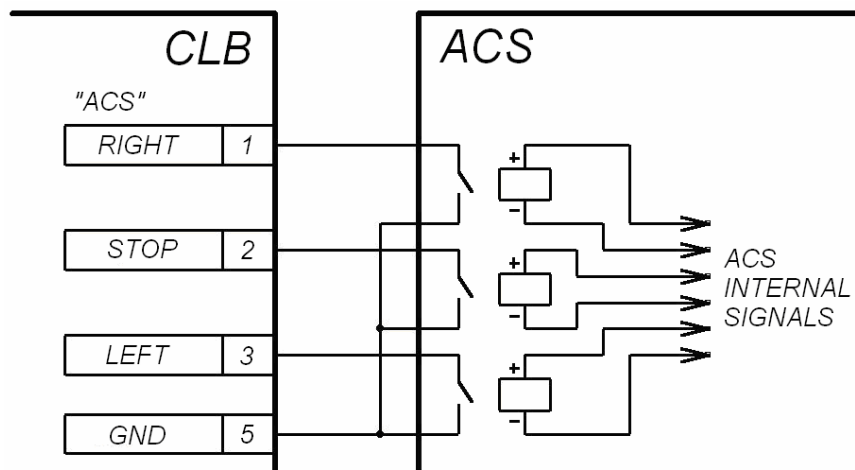
As the control element in the ACS (see Fig. 5) there can be used a normally open relay contact or a circuit with open collector output with the following signal characteristics:

- voltage at open contact..... $5 \pm 0,5$  V;
- voltage at closed low-level contact.....max 0,8V;
- current via closed contact .....max 1,5 mA.

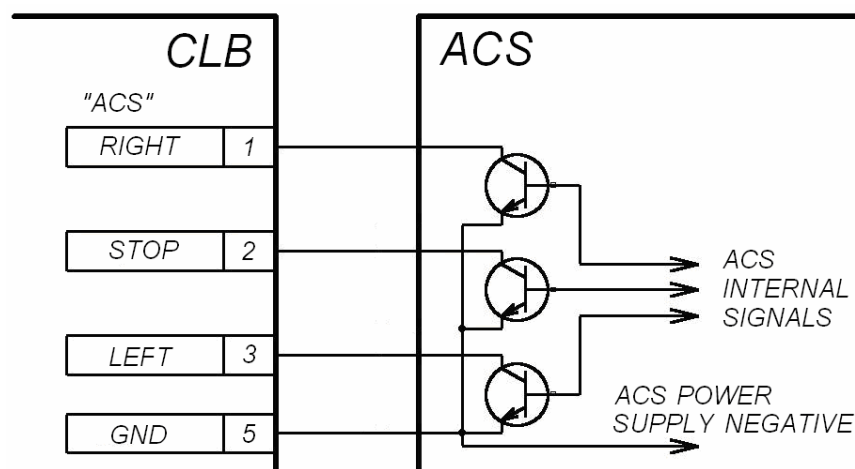
The optic barrier wing rotation sensors, placed inside the turnstile post, track passages through the turnstile. The passage direction is determined according to sequence of the sensors operated.

When turning the barrier wing, the closed contacts «**Pass R1**», «**Pass R2**» or «**Pass L1**», «**Pass L2**» of the CU «**ACS**» connector are broken. The signal duration depends on the rotation speed of the barrier wings. There are several additional signals put out at the CU «**ACS**» connector:

- «**Pwr failure**» – AC mains failure (contacts «**Pwr failure C**» and «**Pwr failure E**» — collector (+) and emitter (-) of the galvanic decoupling circuit correspondingly).



a) Control elements of an external device a normally open relay contact



6) Control elements of an external device a circuit with open-collector output

Figure 5 Control elements in the ACS

At the AC mains failure the transistor is closed;

- **«Bat failure C»** – built-in SPS failure (contacts **“Pwr failure C”** and **“Pwr failure E”** – collector (+) and emitter (-) of the galvanic decoupling circuit correspondingly).

At the built-in SPS failure (the battery discharge up to 22.5V) the transistor is closed;

- **«Pass Sensor»** – the data of the infrared intrusion detector. This data is transmitted to the ACS from the intrusion detector (if installed). Relay output (contacts **Pass Sensor 1** and **Pass Sensor 2**).

The CU output cascades, generating the signals **«Pass R»**, **«Pass L»**, **«Pass Sensor»**, **«Pwr failure»** and **«Bat failure»**, have the galvanic decoupling.

To generate the signals **«Pass R»**, **«Pass L»** and **«Pass Sensor»** the CU output cascades have the relay output circuits with the following signal characteristics:

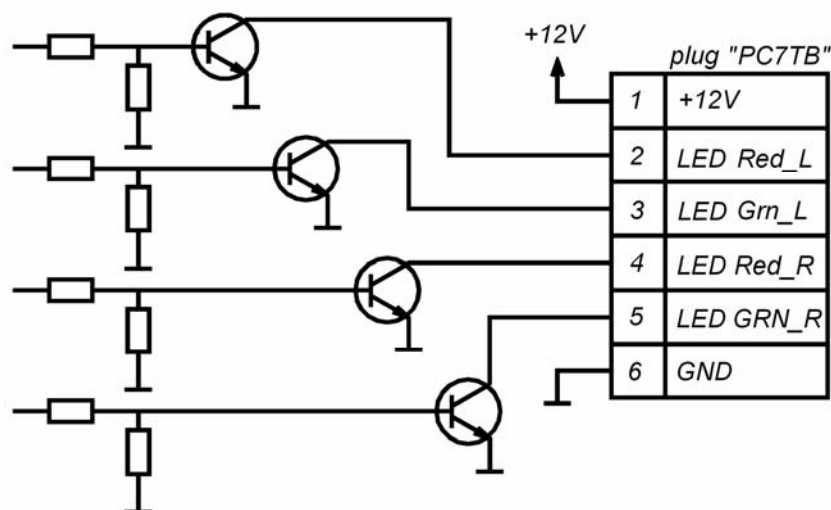
the maximum voltage .....max 50 V  
the maximum current.....max 200 mA

To generate the signals **«Pwr failure»** and **«Bat failure»** the CU output cascades have the optoelectronic decouplings with the following signal characteristics:

output transistor type..... n-p-n  
insulation voltage .....5,3 kV  
the maximum collector-emitter voltage.....max 25V  
the maximum current.....max 50 mA

## 5.4 General requirements for indicators connection to the turnstile

For indication control is used a transistor circuit with open collector (see Fig. 6).



**Figure 6** Indication control circuit

The connector (the RC7TV plug) pins assignment for indicators connection on the cable connectors block:

- **“+12V”** — supply voltage;
- **“LED Red\_L”** — is activated at ban on passage to the left (the output transistor is open, the corresponding connector's pin is connected to the **“GND”**);
- **“LED Grn\_L”** — is activated at permission on passage to the left;
- **“LED Red\_R”** — is activated at ban on passage to the right;
- **“LED Grn\_R”** — is activated at permission on passage to the right;
- **“GND”** — “Common”.

The indication control circuit has the following characteristics:

- the maximum current via the contacts “+12V” and “GND” .....200 mA;
- the maximum current via the contacts “LED Red\_L”, “LED Grn\_L”, “LED Red\_R” and “LED Grn\_R” .....100 mA;
- the maximum voltage applied to the contacts “LED Red\_L”, “LED Grn\_L”, “LED Red\_R” and “LED Grn\_R” relatively to the “GND” ..... 40 V.

## 5.5 Mechanical unblocking of the turnstile

Possibility to unblock the turnstile manually is specially provided for unblocking the turnstile in the emergency mode at all the power supplies failure — AC mains switching off and the complete discharge of the built-in SPS battery (or at the failure of any other applied external power supplies).

To unblock the turnstile it is necessary to insert the key (5) into the lock (4) on the turnstile post cover (3) and turn it at 90° clockwise. The barrier wings can be freely turned in both directions at that.

To dismantle the barrier wing in emergency cases, loose the M10 bolts, fixing the barrier wing (6), through the coupling fittings (14) holes with the S5 hex-nut wrench and remove the barrier wing together with the filler panel (7) out of the coupling fittings (14).

Deactivating mechanical unblocking of the turnstile in the following order: install barrier wings to the starting position, turn the mechanical release key in the reverse direction, make sure that the turnstile is locked, and the barrier wings do not rotate in any direction.



### **Note!**

For urgent evacuation of people from business facilities in case of fire, natural calamities and other emergencies, the additional emergency exit should be provided.

## 6 MARKING AND PACKAGING

The turnstile has the following marking:

- on the turnstile post – a label located on the underside of the flange;
- on the control unit – a label located on the rear panel of the control unit.

The turnstile in the delivery set (see Chapter 4) is packed into the shipping box, which keeps it undamaged during the transportation and storage.

The shipping box dimensions are (length × width × height)..... 108×66×26 mm

The shipping box has the serial number marking and the additional marking in accordance with the design documentation and the delivery set.

## 7 SAFETY REQUIREMENTS

### 7.1 Installation safety requirements

Installation should be performed by qualified personnel only, in strict accordance with the Manual and general electrical safety requirements for electrical and installation work.



#### **Attention!**

- Only serviceable tools should be used.
- All the connections should be performed only after the CU is disconnected from the power supply.
- Cables should be laid in accordance with electrical safety requirements.
- The turnstile is heavy, hold it to prevent the fall!

### 7.2 Operation safety requirements

Observe general safety requirements for use of electrical equipment.



#### **Don'ts!**

- Do not use the turnstile under conditions that do not comply with the requirements of Chapter 2 of this Manual;
- Do not mount the control unit on the current-conducting surfaces or install in wet premises;
- Do not open the CU cover prior to the power supply switching off;
- Do not replace the fuses prior to the CU power supply switching off.

The turnstile operates within voltage range from 198V AC to 242V AC only. In case of the voltage jump, exceeding the operating voltages, use a voltage stabilizer.

## 8 INSTALLATION INSTRUCTIONS

### 8.1 General Recommendations

**It is recommended:**

- to mount the turnstile on steady and level concrete (grade 400 or higher, strength group V22.5), stone or similar foundations at least 150mm thick;
- to level the foundation so that the anchoring points of the turnstile post lie in the same plane;
- to apply reinforcing elements (300×300×300mm) for installation on less steady foundation;
- to mark the mounting holes according to the enclosed installation instructions (see Fig.7);
- to control the vertical position of the turnstile post during installation.

### 8.2 Tools and equipment required for installation

- 1.2–1.5 kW hammer drill;
- Ø14 mm hard-alloyed drill for anchor bolts;
- Ø 5 hard-alloyed drill for CU;
- Wall chaser for laying the cable;
- Phillips head screwdriver №2;
- flat blade screwdriver;
- Knife assembly;
- Allen key S=5,
- Allen key S=8;
- Plumb-line and level;
- Measuring tape 2m

### 8.3 Installation procedure



**Note!**

The manufacturer shall not be liable for any damage caused in the result of improper installation and declines any claims arising thereof in case if the installation is not in compliance with the instructions provided in this Manual.

Recommendations for preparation of mounting holes for installation of the turnstile and railing posts are given for the "SORMAT" anchor bolts for steady concretes (see Table 1).

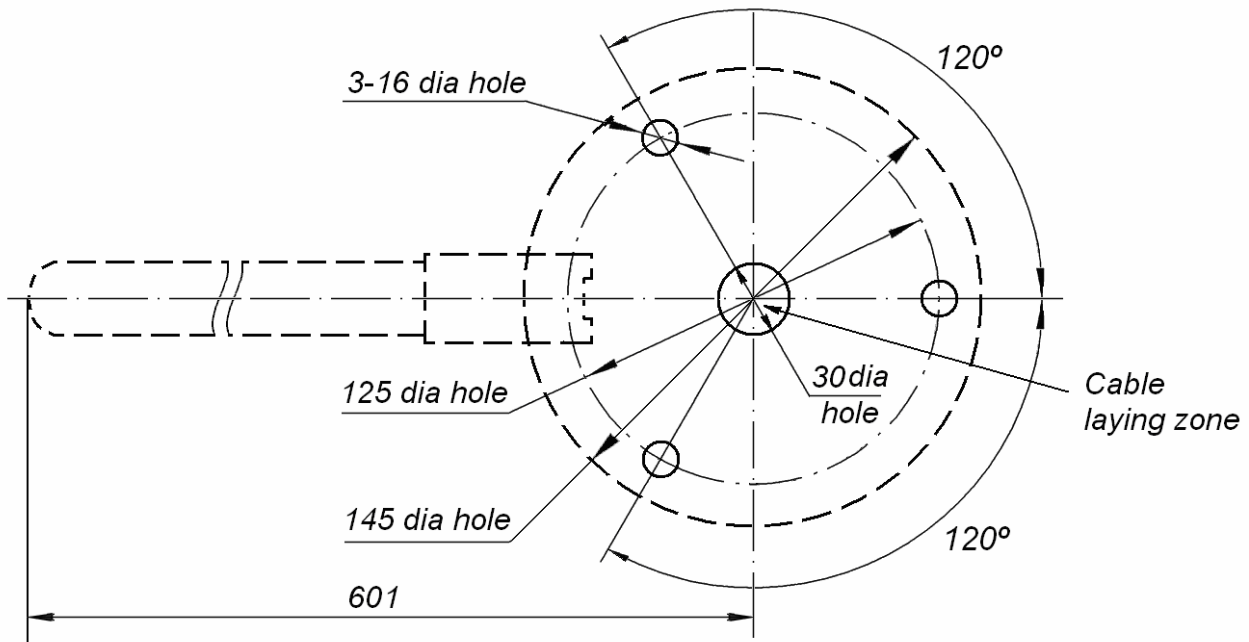
**Table 1**

Anchor bolt size, mm	Drill diameter, mm	Drilling depth, mm
PFG IH 10	16	60

The turnstile should be mounted by at least two persons including qualified assembler and electrician.

1. Unpack the turnstile, check the completeness as per Chapter 4 of this Manual.
2. Mark out the holes for the anchor bolts for the turnstile post installation and electric raceways for the control cable (10) and the power cable (11) as shown in Fig. 7 and according to your checkpoint layout.



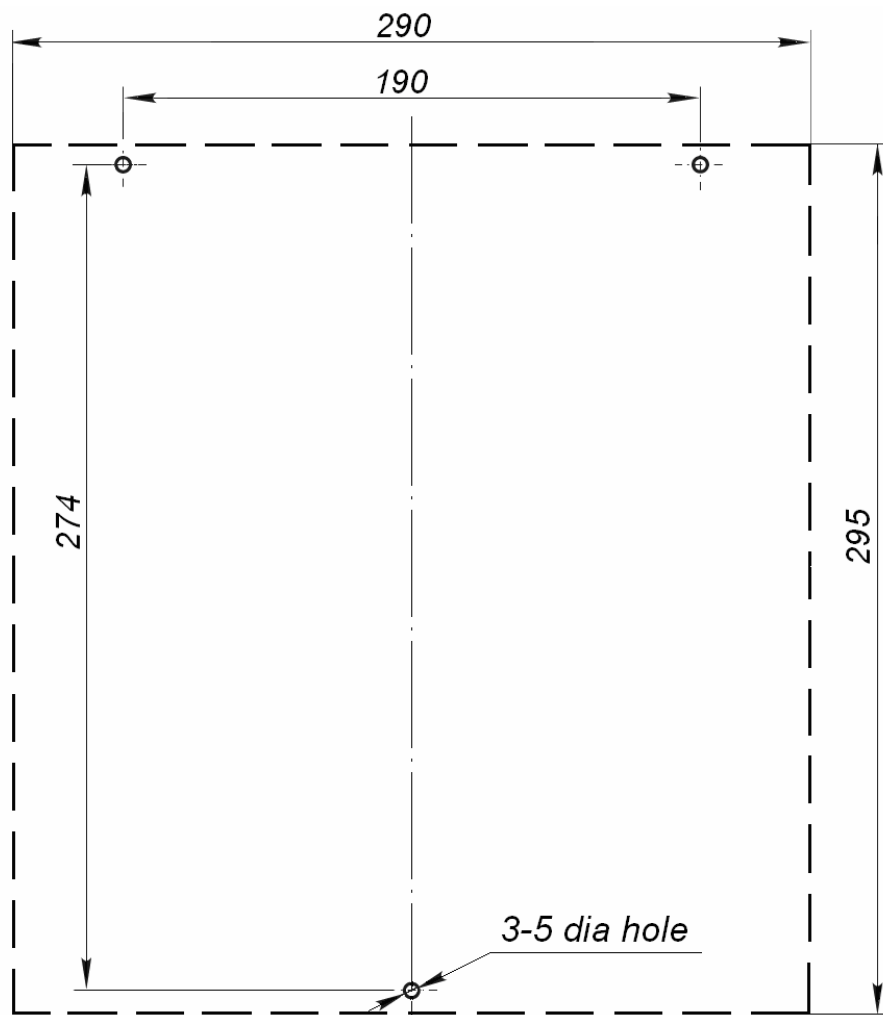


**Figure 7 Marking layout for RTD-03S installation  
(dotted line shows the dimensions of the turnstile  
and the position of one of its wings)**

3. Drill the holes for the cables and PFG IH 10 anchor bolts for the turnstile post mounting (3 holes Ø16×60mm) in the floor. Insert the anchor bolts sleeves into the holes so that they do not stick out above the floor surface.
4. Lay out the control cable (10) and the power cable (11) from the control unit (8) via electric raceways to the turnstile post.
5. Unpack the turnstile post from the shipping box and carefully place it on the prepared steady surface. Take the cable connectors block (16) out of the turnstile post with flange (2) (see Fig. 2). Connect the control cable (10) and the power cable (11) to the corresponding connectors of the cable connectors block (16), located inside the turnstile post with flange (2) according to the connections scheme (see Fig. 10 Appendix 2). After you carry out the connections, install the cable connectors block (16) into the turnstile post with flange (2) at height suitable for further installation. Place the turnstile post in the upright position.
6. Mount the turnstile post flange on the anchor bolts sleeves. The turnstile post should be mounted strictly upright. The turnstile post adjustment is recommended to perform by installing the different-size gaskets under the turnstile post flange. Note, the turnstile post is heavy, hold it to prevent the fall. Fasten the turnstile post with three screws M10×70 with recessed hexahedron.
7. Take the barrier wings (6) out of the shipping box. Set the filler panels (7) into the fastenings (15), aligning them in height and observing gap uniformity, and fix them with the fastenings screws. Mount the barrier wings into the coupling fittings (14) of the rotary post (1). Tighten the barrier wings (6) mounting screws through the coupling fittings (14) holes. Check the strong fastening of the barrier wings (6) and the filler panels (7).
8. Check free rotation of the rotary post (1). Unblock the rotary post with the mechanical release key (5) (see Clause 5.5). The rotary post (1) with barrier wings (6) should be turned by hand easily without jamming. The rotation force at the

center of the barrier wing (6) should be not more than 1.5 kgf. The rotation force can be measured by a dynamometer or a domestic spring balance. Block the turnstile with the key (5) after the check.

9. Mark out the holes for wall mounting of the control unit (8) as shown in Fig. 8. Drill the holes and insert the plastic dowels, included in the installation kit. Insert the top screws, suspend the control unit and fix it with the bottom screw to prevent the accidental pull off. Fix the control unit (8) considering that the convenient access to the toggle switches, fuses and indicators is provided (Fig. 3). The control unit (8) should be mounted on the wall upright with the connectors down. The AC power cable (12) should easily touch the mains plug.
10. Connect the cables 10, 11, 13 to the control unit (8) as follows (see Fig. 3):
  - control cable (10) to the **“Control”** connector;
  - power cable (11) to the **“DC=24V”** connector;
  - put remote control cable (13) through its cable inlet inside the control unit and connect it to the X3 and X4 connectors on the processor module as per Fig. 9 of Appendix 1 and Fig 10 Appendix 2.
11. Set the CU **“Power”** toggle switch and the CU **“Battery”** toggle switch to the **“O”** position. When connecting the indicators observe the requirements in Clause 5.4.



**Figure 8 Hole pattern for CU mounting**

## 9 OPERATION INSTRUCTIONS



### **Warning!**

It is prohibited:

- To use abrasive or chemically active substances for cleaning the external surfaces;
- To move through the gate passage area any objects with dimensions exceeding the width of the passageway;
- To jerk or hit the swing panel and the gate post so as to prevent their mechanical deformation.

### 9.1 Power-up



### **Warning!**

Observe general electrical safety requirements during the turnstile operation.

- Check the accuracy of all the connections and the AC power cable operability;
- Prior to the turnstile power-up, set the «**Power**» toggle switch and the «**Battery**» toggle switch to the “O” position;
- Install the «**Bat/2A**» fuse, which is provided together with the set of spare parts, into the fuse slot on the CU lower panel;
- Connect the AC power cable (12) of the CU (8) to the 220V / 50Hz AC outlet;
- Check the rotation in either direction is blocked with the mechanical release key;
- Clear the passage area;



### **Warning!**

Do not connect the control unit to the mains with the voltage and frequency rating other than specified in Chapter 3 of this Manual.

- Set the «Power» toggle switch and the «Battery» toggle switch to the “I” position. At the same time the indicators «Power» and «24V» on the CU (8) will light up, a two-tone audio signal will be generated. The indicator above the STOP button on the RC (9) will light up.

See instructions below:

- Any operating mode is set by pushing the buttons of the RC or the tag of the wireless remote control kit.
- After pushing the STOP button the turnstile is set in the “Always locked” mode, and the barrier wings return to the reset state.

### 9.2 Operating modes

After its power-up the reset state of the turnstile is the “Closed” position (the mechanical lock is locked up with a key).

The following operating modes with the corresponding indication, which can be set from the RC, are shown in Table 2.

Features:

- Installation of any type mode by pressing the buttons on the remote control (or a wireless remote control) in an appropriate combination;
- pressing STOP turnstile switches to “Closed”, and the automatically reset the barrier wing to the reset state;

- In the “Single passage” mode (in the chosen or both directions) the locking device, corresponding to the chosen direction, is unblocked. The turnstile remains in the “Open position” for a time period, which is called the passage waiting time and is 5 sec. preset;
- For passage one should turn the barrier wing at 15° in the passage direction. The electric drive will automatically reset the barrier wing to the reset state in the passage direction;
- In the “Single passage” mode if the passage is not effected within the passage waiting time, the turnstile will close automatically and the “Always locked” mode will be set;
- At setting the “Single passage mode” in one direction and then in the other direction, the countdown of the passage waiting time is effected for each direction independently;
- In the “Bidirectional single passage” after the passage is effected in one of the directions, the electric drive will automatically reset the barrier wing to the reset state. The turnstile is ready for passage in the other direction and the passage waiting time is counted for the other direction afresh at that;
- In the “Single passage” mode at completing the barrier wing rotation cycle to the reset state, the other mode setting, except for the “Always locked” mode, will be blocked. A command for the new passage mode, entered by the RC, will be enquired in the command queue of the turnstile;
- After the barrier wing is reset to the reset state, the command from the command queue will be performed automatically;
- In the “Always free” mode (in the chosen or both directions) the electric drive will automatically reset the barrier wing to the reset state, like in the “Single passage” mode. The passage waiting time is not counted at that;
- It is possible to change the “Free passage in the set direction” to the “Free passage in the set direction and single passage in the opposite direction” mode. In the “Free passage in the set direction” mode push the button, corresponding to the other passage direction, on the RC (or the tag of the wireless remote control kit). After the passage is effected, the turnstile turns to the previous mode;
- At completing the barrier wing rotation cycle, if forced blocking of the barrier wings is applied, the turnstile stops rotation during 3 sec and then resets the barrier wings in the same direction;
- If forced blocking of the barrier wings is applied for the second time, the turnstile turns to the emergency mode with intermittent indication on the RC and an intermittent audio signal. The emergency mode duration is 10 sec, after that the electric drive resets the barrier wings to the reset state;
- If the turnstile is set in the “Single passage” mode (in the chosen or both directions), it turns to the “Always locked” mode after the emergency mode;
- To cancel the emergency mode, push the STOP button on the RC (or the tag of the wireless remote control kit);
- If the turnstile is set in the “Free passage” mode (in the chosen or both directions), it turns to the earlier preset mode after the emergency mode.

**Table 2 Turnstile operating mode**

<b>№</b>	<b>Turnstile operating mode</b>	<b>Your actions</b>	<b>Indication on the RC</b>	<b>Indication outputs status</b>	<b>Turnstile status</b>
1	Always locked (Closed for entry and exit)	Press the <b>STOP</b> button on the RC	The red indicator above the <b>STOP</b> button is on	<b>“LED Red_L”</b> and <b>“LED Red_R”</b> outputs are active	The barrier wings are in the reset state. The barrier wings rotation is blocked in either direction
2	Single passage in the set direction (open for passage of one person in the chosen direction)	Press the button corresponding to the chosen passage direction	The green indicator above the button of the chosen passage direction and the red indicator above the <b>STOP</b> button are on	<b>“LED Grn_L”</b> or <b>“LED Grn_R”</b> output is active depending on the set direction	The barrier wings rotation in the set direction is allowed
3	Bidirectional single passage (open for one-by-one person passage in each direction)	Press both passage buttons simultaneously (left and right side buttons on the RC)	The two green indicators (left and right) and the red indicator above the <b>STOP</b> button are on	<b>“LED Grn_L”</b> and <b>“LED Grn_R”</b> outputs are active	The barrier wings rotation in one direction and then in the other direction is allowed
4	Free passage in the set direction (open for free passage in the chosen direction)	Press the <b>STOP</b> button and the button corresponding to the chosen passage direction simultaneously	The green indicator above the button of the chosen passage direction is on	<b>“LED Grn_L”</b> or <b>“LED Grn_R”</b> output is active depending on the set direction	The barrier wings rotation in the set direction is allowed without any limitations
5	Free passage in the set direction and single passage in the opposite direction (open for free passage in the chosen direction and for a person's passage in the opposite direction)	Carry out actions stated in Chapters 2 and 4 of the present table in any order	The two green indicators above either passage direction and the red indicator above the <b>STOP</b> button are on	<b>“LED Grn_L”</b> and <b>“LED Grn_R”</b> outputs are active	The barrier wings rotation on the free passage direction without any limitations and a single rotation in the opposite direction are allowed
6	Always free (open for entry and exit)	Press all the three buttons on the RC simultaneously	The two green indicators (left and right) are on	<b>“LED Grn_L”</b> and <b>“LED Grn_R”</b> outputs are active	The barrier wings rotation in any direction is allowed without any limitations

**Note 1**

If it is necessary to free the passageway for more than one hour, turn off the power and unlock the turnstile with the key override in order to avoid overheating of the magnet winding (ref. sect. 5.5).

**Note 2**

Proceed as follows to change the RC orientation towards the turnstile post:

- Set the «Power» and «Battery» switchers on the control unit (8) in the «0» position (Fig. 3);
- Disconnect the power cable (12) from the mains;
- Swap positions of the following RC cables inside the control unit, on the connectors X3 and X4 of the processor module (Fig. 9 Appendix 1 and Fig. 10 Appendix 2) white with green and yellow with red cable, that is connect the cables as follows:
  - a) white— to contact 3 on the X3;
  - b) green – to contact 1 on the X3;
  - b) yellow – to contact 3 on the X4;
  - r) red — to contact 1 on the X4;
- check all the cable connections are correct;
- turn the power on as per section 9.1;
- check the operation as per section 9.2.

### 9.3 Operation from the built-in SPS

In case of the AC mains failure the turnstile remains operative and turns to the built-in SPS (the “**Battery**” toggle switch is in the “**I**” position). When operating from the SPS the “**Battery**” indicator on the CU is on and the “**Power**” indicator is off. The “**Pwr failure**” signal, notifying of the AC mains failure, is transmitted to the CU “**ACS**” connector. In about 5 seconds there will be intermittent indication (with blinking interval of 1 second) on the RC.

At the SPS battery discharge up to  $22 \pm 0,5V$ , in addition to the intermittent indication, an audio signal with 30 seconds interval, warning about the discharge, will be generated by the RC. This signal, consisting of six short signals, is generated only in the “**Always locked**” mode every 30 seconds. The “**Bat failure**” signal will be formed at the CU “**ACS**” connector.

At the SPS battery discharge up to  $20.8 \pm 0.5V$  the gate will turn to the “**Always locked**” mode. The passage modes setting by the RC or ACS is blocked. The indicator above the “**STOP**” button will start blinking with interval of 2 seconds. At the further battery discharge the CU will automatically switch off.

When the AC mains is restored, the turnstile turns to the AC mains (the “**Power**” toggle switch is in the “**I**” position). The built-in SPS battery will recharge automatically, if the «**Battery**» toggle switch is in the “**I**” position.

Operation time with the built-in SPS is 1.5 hours or 1,200 passages provided that the battery is fully charged.

**Note!**

The CU SPS contains a lead-acid battery, which is not recommended to be stored for a long time without recharge. For recharge during the storage period the CU must be switched on for 24 hours every 8 months (every 2 months when storing at ambient temperature above  $+30^{\circ}C$ ).

The sequence of actions is given in Clause 9.1. It is allowed not to connect the gate post or the RC to the CU during discharge.

## 9.4 Operation from the external power supply

The external power supply is connected via the “**Bat=24V**” connector, located on the CU lower panel. Pin assignments for external power supply connector are shown in Fig. 4.

The external power supply connector (XLR3 cable plug) is included in the set of spare parts.

To connect the external power supply:

- Turn the toggle switches “**Power**” and “**Battery**” to the “**O**” position;
- Remove the “**Bat/2A**” fuse on the CU lower panel;
- Connect the external power supply and turn the “**Battery**” toggle switch to the “**I**” position.

Operation from the external power supply is similar to the operation with the built-in SPS as given in Clause 9.3 of the Manual.

## 9.5 Troubleshooting

Possible faults, which can be cleared by the users themselves, are listed in Table 3.

**Table 3 Potential problems and their remedies**

No	Fault	Possible cause	Remedy
1	The turnstile does not work after its power-up (the “ <b>Power</b> ” toggle switch is in the “ <b>I</b> ” position, the “ <b>Battery</b> ” toggle switch is in the “ <b>O</b> ” position). The indicators on the CU front panel and RC are off.	The “ <b>220V/1A</b> ” fuse is burnt out	Turn the “ <b>Power</b> ” toggle switch to the “ <b>O</b> ” position. Disconnect the CU from the AC mains and replace the fuse on its lower panel (see Fig. 3)
2	The CU indicators “ <b>Power</b> ” and “ <b>24V/2A</b> ” are on but the “ <b>24V</b> ” indicator on the CU and RC is off.	The “ <b>=24V/2A</b> ” fuse is burnt out likely due to external short circuit (for example, in power cable connectors)	Turn the “ <b>Power</b> ” toggle switch to the “ <b>O</b> ” position. Disconnect the CU from the AC mains, clear the circuit and replace the fuse on the lower panel of the CU
3	In the case of the AC mains failure and when the CU is powered up from the built-in SPS (the “ <b>Battery</b> ” toggle switch is in the “ <b>I</b> ” position), the turnstile does not work, the indicators on the CU front panel and RC are off	The “ <b>Bat/2A</b> ” fuse is burnt out	Turn the “ <b>Battery</b> ” toggle switch in the “ <b>O</b> ” position. Disconnect the CU from the AC mains and eliminate the short circuit. Replace the fuse on the CU lower panel
4	In the case of the AC mains failure and when the CU is powered up with the external SPS via the “ <b>Bat=24V</b> ” connector (the “ <b>Battery</b> ” toggle switch is in the “ <b>I</b> ” position, the “ <b>Bat/2A</b> ” fuse is not installed), the turnstile does not work, the indicators on the CU front panel are off	The external SPS failure	Turn the “ <b>Battery</b> ” toggle switch in the “ <b>O</b> ” position. Disconnect the CU from the external SPS. Replace the external power supply.

All other faults shall be cleared by the manufacturer or the manufacturer’s representative.

## **10 MAINTENANCE**

The turnstile maintenance during the whole operating period is performed by the manufacturer or the manufacturer's representative.

For cleaning the turnstile post and the barrier wings it is recommended to use liquid purifiers, containing liquid ammonia. For cleaning the filler panels it is recommended to use purified turpentine (for polycarbonate plastic) or liquid purifiers, containing liquid ammonia (for prestressed glass).

## **11 TRANSPORTATION AND STORAGE**

The turnstile in the original package can be delivered by any means of transportation.

During the transportation boxes can be stacked in 3 rows.

The storage of the turnstile is allowed indoors at ambient temperature between  $-40^{\circ}\text{C}$  and  $+45^{\circ}\text{C}$  and at relative air humidity up to 70% at  $+27^{\circ}\text{C}$ .

After the transportation at temperatures below zero or at high air humidity the turnstile must be kept unpacked for not less than 24 hours indoors within normal climate conditions prior to putting it in operation.



## Appendix 1 Processor module

The CU contains the processor module that performs the turnstile control. When operating with the ACS the pulse or potential control of the turnstile can be set by the jumper on the X5 connector.

The processor module also contains the connectors for the intrusion detector (X11) and the siren (X10). The RC is connected to the X3 and X4 connectors.

The jumper position and corresponding control mode, the X10 and X11 connectors location as well as pins assignment for connection of the wireless remote control, the siren and the intrusion detector are shown in Fig. 9.

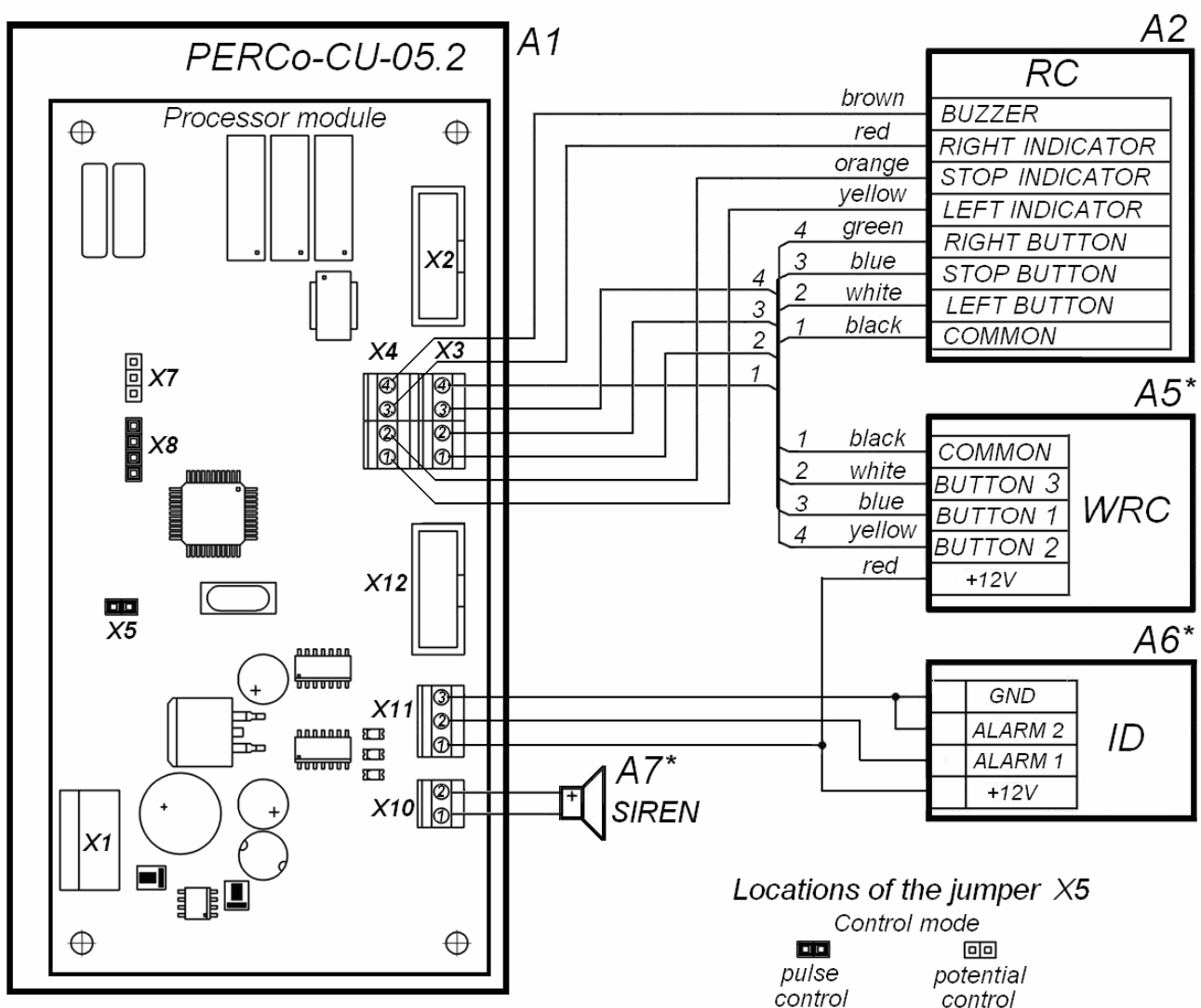


Figure 9 Processor module

## Appendix 2 Electrical connection layout

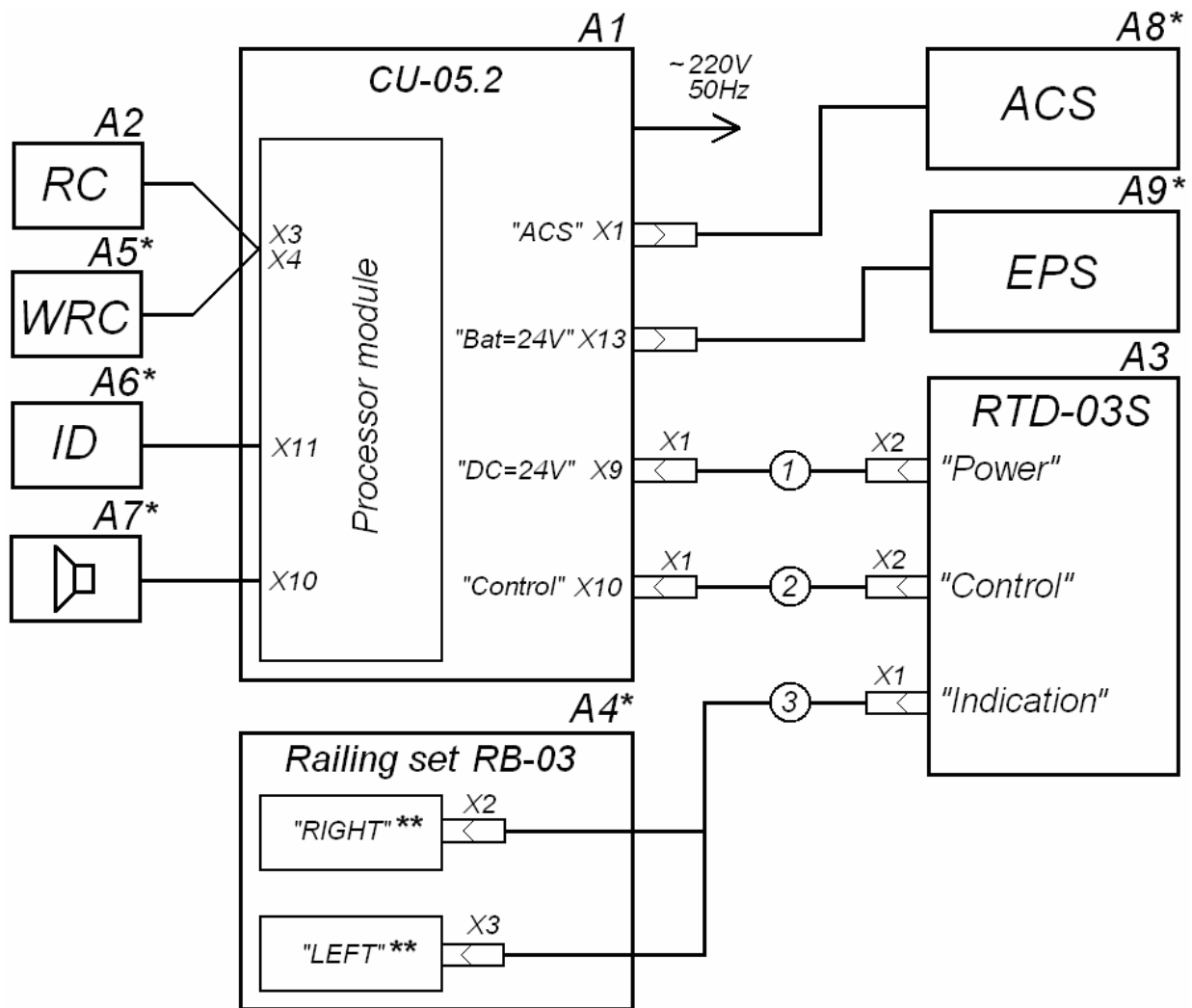


Figure 10 RTD-03S rotor turnstile. Electrical connection layout

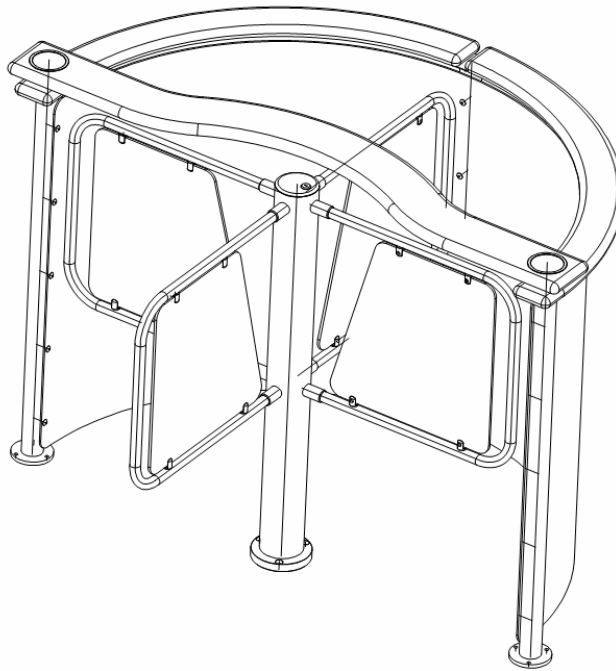
Legend	Item	Qty.	Comments
A1	Control unit	1	
A2	Remote control panel	1	
A3	Turnstile post	1	
A4*	Railing set	1	
A5*	Wireless remote control	1	
A6*	Intrusion detector	1	
A7*	Siren	1	
A8*	ACS	1	
A9*	External power supply	1	24VDC
1	Power cable	1	
2	Control cable	1	
3	Indicator cable	1	

\* – optional

\*\* – position relative to the turnstile post from the passageway

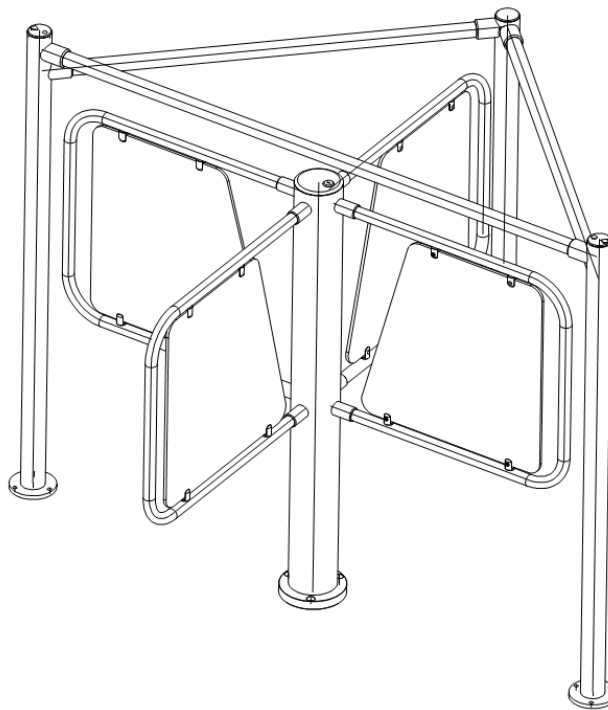
## **Appendix 3 Guide barriers set versions for RTD-03S turnstile**

### **RB-03TP guide barriers set**



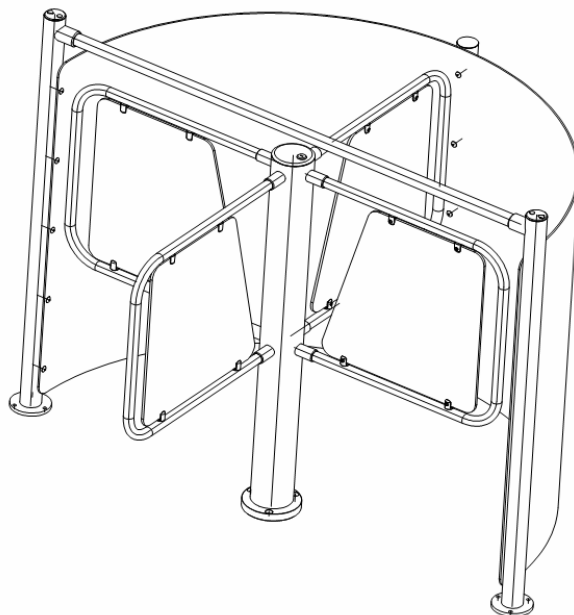
Guide barriers set posts — polished tubular stainless steel dia 50 mm; rails — beechwood (ashwood); filler panels — tinted polycarbonate plastic; mnemonic indication units.

### **RB-03S guide barriers set**



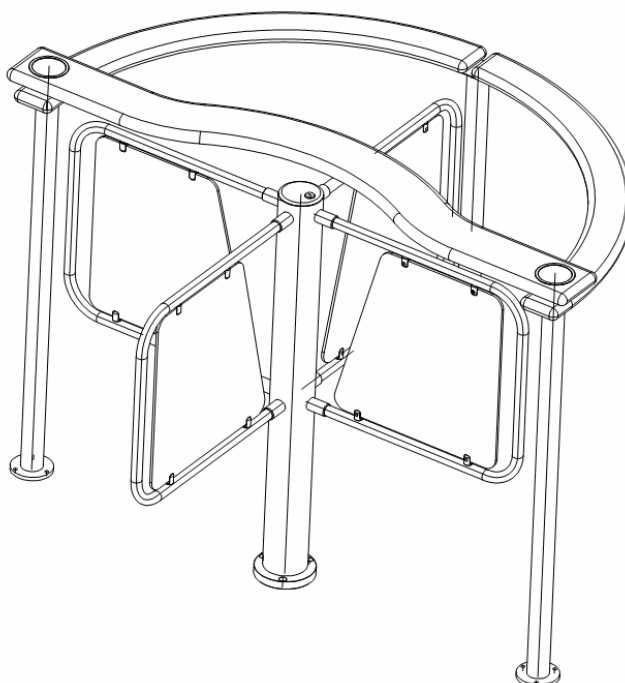
Guide barriers set posts — polished tubular stainless steel dia 50 mm; rails — polished tubular stainless steel Ø32 mm; symbol indication units.

### RB-03SP guide barriers set



Guide barriers set posts – polished tubular stainless steel dia 50 mm; rails – polished tubular stainless steel dia 32 mm; filler panels – tinted polycarbonate plastic; symbol indication units.

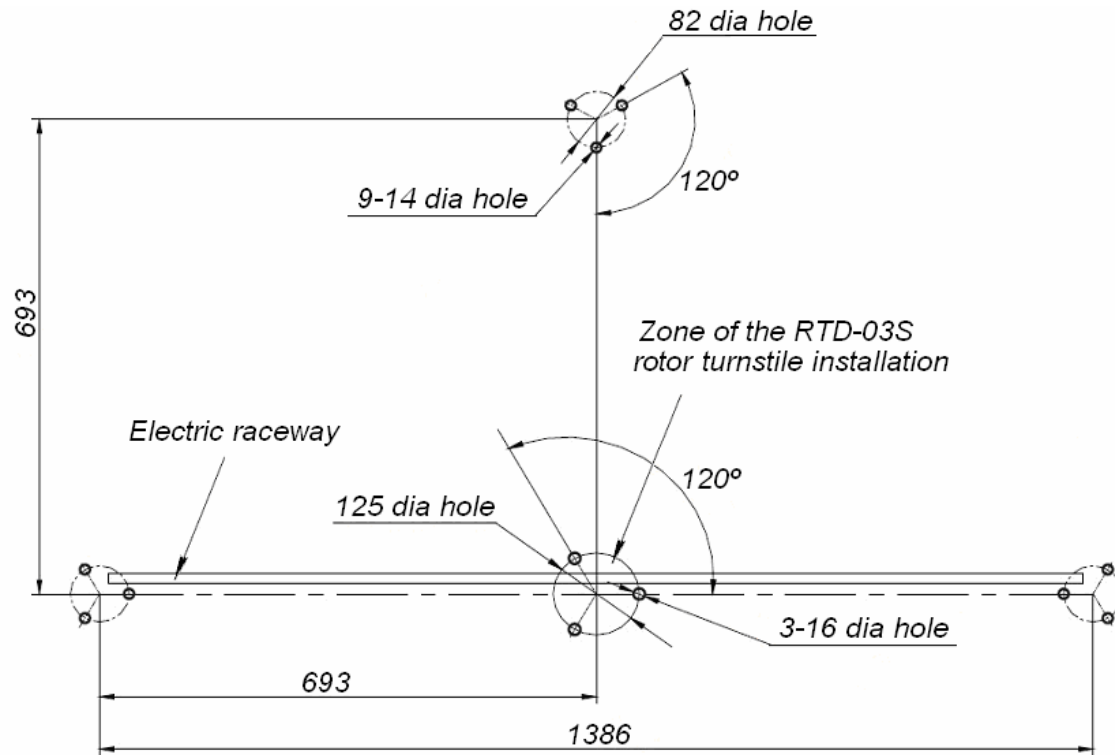
### RB-03T guide barriers set



Guide barriers set posts — polished tubular stainless steel dia 50 mm; rails — beechwood (ashwood); mnemonic indication units.

### Marking layout for installation of turnstile with guide barriers set:

(electric raceway to the control unit is laid from the turnstile post center in the direction of the control unit according to the layout).



**Figure 11 Marking for mounting of the Railing set posts**









# **PERCo**

Polytechnicheskaya str., 4, block 2  
194021, Saint Petersburg  
Russia

Tel: +7 812 247 04 64

**E-mail: [export@perco.com](mailto:export@perco.com)  
[support@perco.com](mailto:support@perco.com)**

**[www.perco.com](http://www.perco.com)**



[www.perco.com](http://www.perco.com)