

# Electromechanical Box Tripod Turnstile



## TTD-03.2

### Operation manual



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*Dear customers!*

*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 the TTD-03.2 electromechanical box tripod turnstile (hereinafter referred to as the “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:

- ACS — access control system;
- CLB — control circuit board (Control Logic Board).

## 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 30 persons/min.

## 2. OPERATION CONDITIONS

The turnstile, in accordance with the resistance to environmental exposure, is compliant with GOST 15150-69, category NF 4 (artificially controlled climate conditions).

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

## 3. TECHNICAL SPECIFICATIONS

|                                                                        |                                      |
|------------------------------------------------------------------------|--------------------------------------|
| Turnstile input DC voltage .....                                       | 12±1.8V                              |
| Turnstile power consumption .....                                      | not more than 8.5W                   |
| Turnstile housing overall dimensions (length x width x height) .....   | 980x664x1010mm                       |
| Remote control panel overall dimensions (length x width x height)..... | 127x84x30mm                          |
| Passageway width.....                                                  | 500mm                                |
| Net weight of the turnstile.....                                       | not more than 50kg                   |
| Net weight of the remote control panel .....                           | not more than 0.35kg                 |
| Remote control panel cable length.....                                 | no less than 6.6m                    |
| Barrier arm rotation force .....                                       | not more than 3.5kgf                 |
| Throughput of the turnstile in the free passage mode.....              | 60 persons/min.                      |
| Throughput of the turnstile in the single passage mode .....           | 30 persons/min.                      |
| Mean time to failure.....                                              | not less than 2,000,000              |
| Mean lifetime .....                                                    | 8 years                              |
| Electric shock protection class.....                                   | III according to GOST R IEC 335-1-94 |

## 4. DELIVERY SET

|                            |   |
|----------------------------|---|
| Turnstile housing .....    | 1 |
| Barrier arms .....         | 3 |
| Remote control panel ..... | 1 |

|                                    |   |
|------------------------------------|---|
| Mechanical release keys .....      | 2 |
| Turnstile housing cover keys ..... | 2 |
| Self-adhesive wires retainer ..... | 2 |
| Fixed brace rod 100mm .....        | 2 |
| Operation manual .....             | 1 |
| Certificate .....                  | 1 |

#### Packaging:

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

#### **Optional equipment is supplied on request:**

- Wireless remote control kit (consists of the receiver and 2 transmitters in the form of a tag with operation range up to 40m) ..... 1
- Siren (for alerts on unauthorized entry attempts) ..... 1
- Passive infrared sensor of intrusion detector ..... 1
- SORMAT PFG IR M 10-15 anchor bolts..... 4
- Turnstile power supply ..... 1
- Remote indicators (for passage direction indication) ..... 2
- Remote indicator power supply..... 1

## **5. BRIEF DESCRIPTION**

### **5.1. Main features**

5.1.1. The turnstile can be operated autonomously from the remote control panel or wireless remote control, as well as from ACS.

5.1.2. The turnstile housing is supplied with the safe voltage — not more than 13.8V (in case of the remote indicators application — not more than 42V).

5.1.3. The turnstile has low power consumption — not more than 8.5W.

5.1.4. At the power supply switching off the turnstile remains in the set position (closed, if it was closed at the moment of the power switching off, or open, if it was open at the moment of the power switching off).

5.1.5. The turnstile ensures automatic reset of the barrier arms to home position after each passage.

5.1.6. The smoothness of the turnstile operation is ensured by the damper.

5.1.7. The optic arm rotation sensors are built in the turnstile housing and ensure accurate count inputs to ACS.

5.1.8. The mechanical release lock is built in the turnstile housing and ensures the turnstile unblocking with a key in emergency cases (free rotation of barrier arms).

5.1.9. Several lined-up turnstiles form passageways without installation of extra guide barriers.

5.1.10. Mount options for intrusion detector and siren to control the passageway.

5.1.11. There are two variants of the turnstile control – pulse and potential.

5.1.12. The turnstile has galvanic decoupling of outputs.

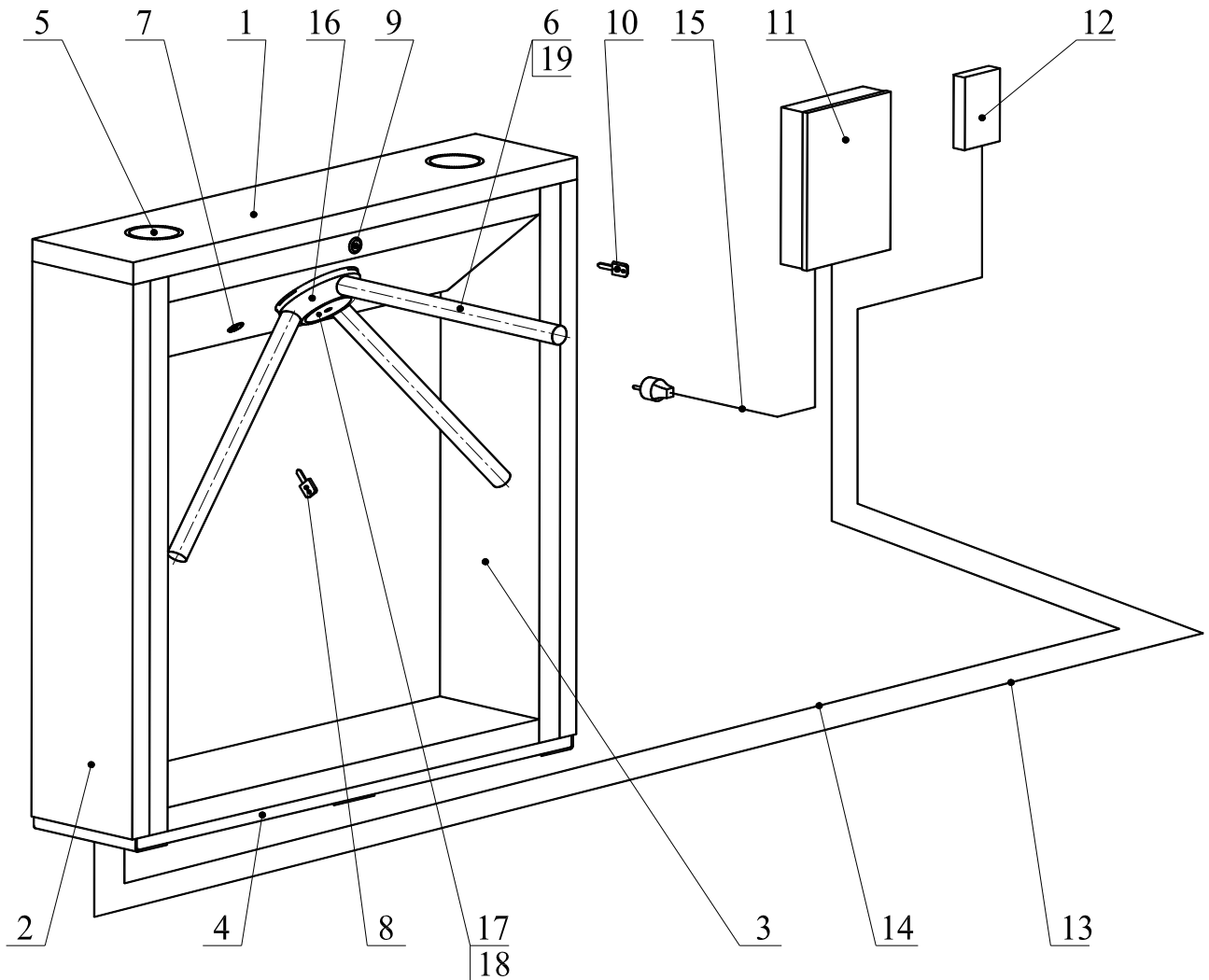
5.1.13. The turnstile has outputs for the remote indicators connection.

5.1.14. The turnstile has an input for the emergency unblocking device connection (for example, the fire alarm unit).

### **5.2. Design**

The turnstile overall view is shown in Fig. 1. Numbers in brackets correspond to Fig. 1 of this Manual.

The turnstile housing overall dimensions are shown in Fig. 2.



**Fig.1. TTD-03.2 box tripod turnstile. Overall view:**

1 — turnstile housing cover; 2 — outer panel; 3 — frame; 4 — base; 5 — indication module; 6 — barrier arm; 7 — mechanical release lock; 8 — mechanical release key; 9 — turnstile housing cover lock; 10 — turnstile housing cover key; 11 — turnstile power supply; 12 — remote control panel / wireless remote control kit / ACS controller; 13 — remote control panel / wireless remote control kit / ACS controller cable; 14 — power supply cable; 15 — AC mains cable; 16 — hub; 17 — cover; 18 — M4x25 screw; 19 — M8x30 bolt.

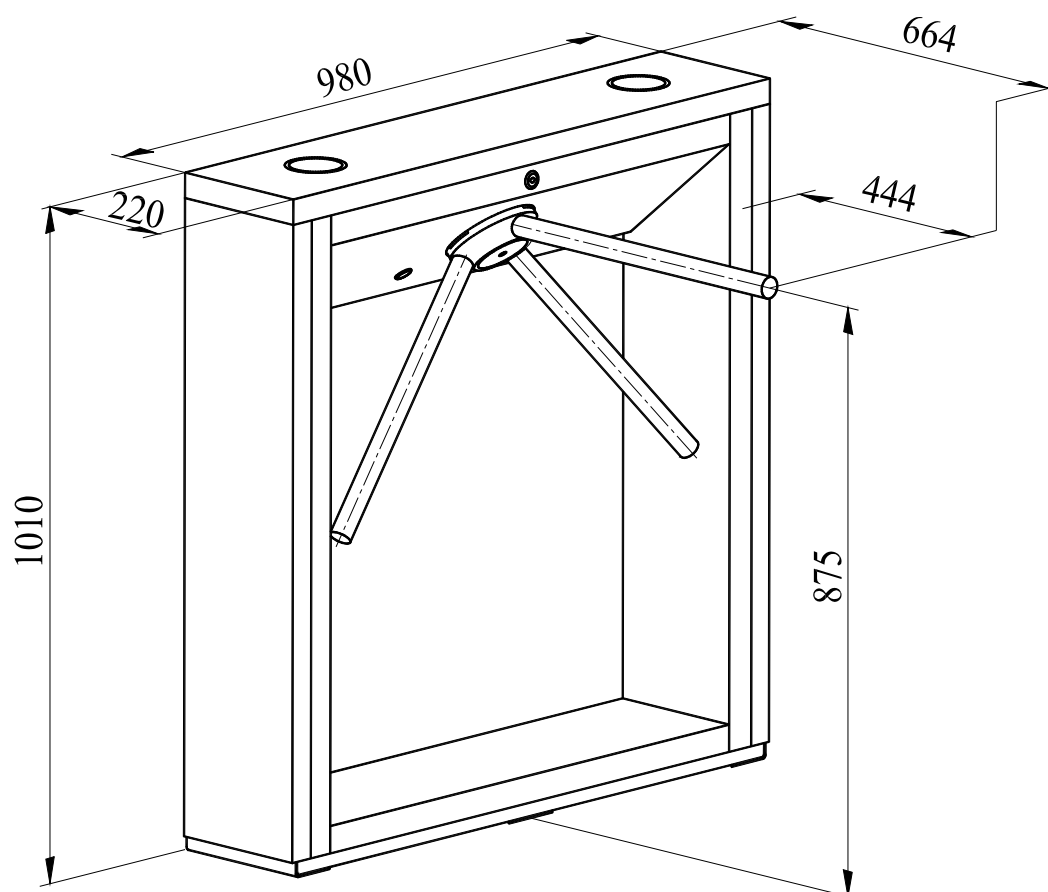
5.2.1. The turnstile consists of a turnstile housing, a turnstile housing cover (1), barrier arms (6) and optional equipment, which is not included in the delivery set.

The turnstile housing has the welded metal frame (3) and two outer panels (2). The frame is fixed on the frame base (4), which is fastened to the floor with four anchor bolts.

The turnstile housing has the welded metal frame (3) and two outer panels (2). The frame is fixed on the frame base (4), which is fastened to the floor with four anchor bolts.

On the frame (3) sidewall under the left-side outer panel (2) there is a CLB (Control Logic Board).

Inside the turnstile housing there is a resetting mechanism consisting of a resetting device (a pusher, springs and roller), a control mechanism with optical sensors of arm rotation and a locking device, and the mechanical release lock (7). Besides, on the resetting mechanism there is the rotation mechanism consisting of the damper, the rotation sensors disk and the hub (16) with three barrier arms (6).



**Fig. 2. TTD-03.2 box tripod turnstile housing. Overall dimensions**

The interior components of the housing can be accessed through the removable top cover (1).

During operation the turnstile cover is locked with the turnstile housing cover lock (9).

5.2.2. To indicate the turnstile state two indication modules (5) with pictograms are located on the turnstile housing cover (1).

5.2.3. The remote control panel / wireless remote control / ACS controller (12) and the turnstile power supply (11) are connected to the CLB with cables (13, 14) in accordance with the connection layout (See Fig. 4).

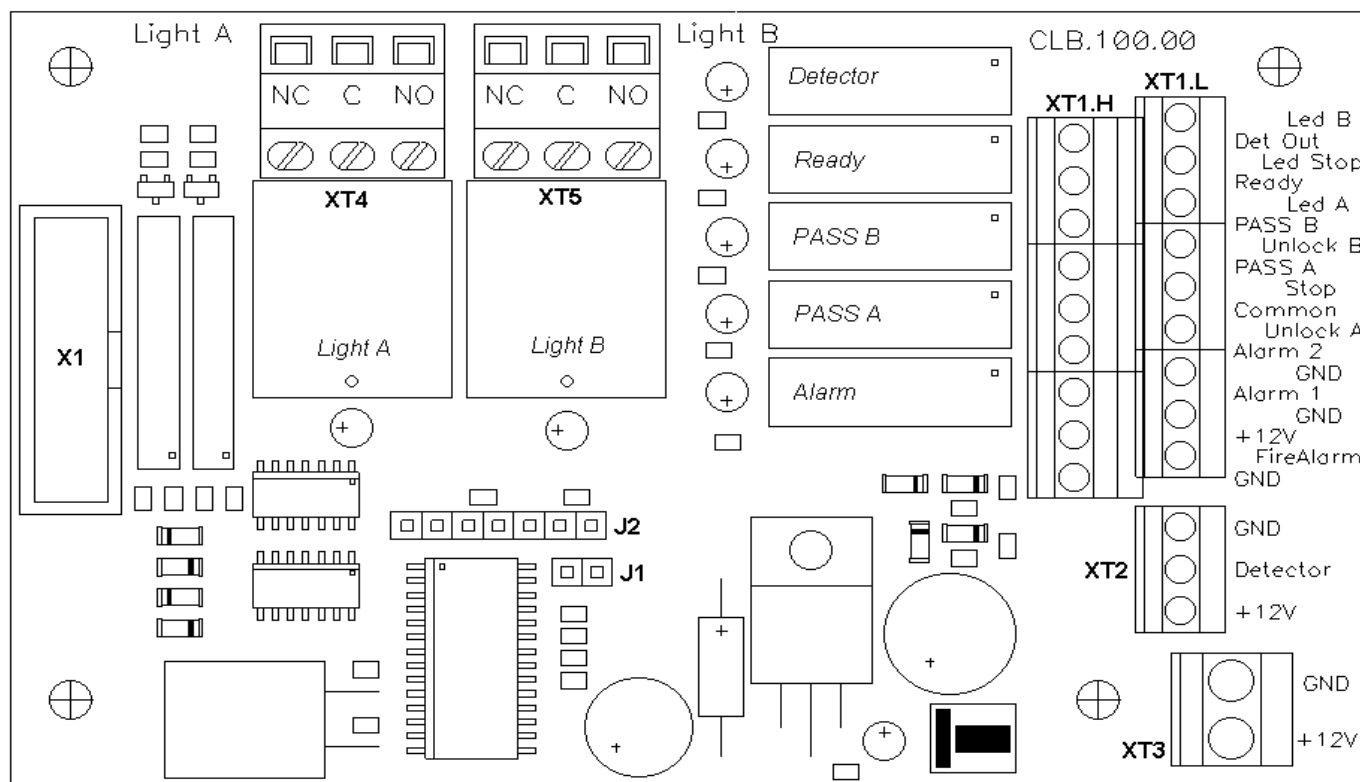
5.2.4. The remote control panel (RC) is designed in the form of a small desktop device with a shockproof ABS plastic case and is intended for setting and indication of the operating modes when the turnstile is operated manually. The RC is connected to the CLB with a multi-thread floppy tape (13) via the "XT1.L" connector block (See Fig. 3).

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 middle button on the RC (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 housing installation is not standard (e.g. the operator's terminal is placed at the backside of the turnstile housing and not at the front side), the RC orientation towards the turnstile housing can be changed by changing places of the RC wires to the contacts "Unlock A" and "Unlock B" as well as contacts "Led A" and "Led B" accordingly (See Fig. 3, 4).

### 5.2.5. The CLB (see Fig. 3) contains:

- Control device connector — “X1” (Control) (using the turnstile cable for connection to the “X1” connector of the control device);
- Clamp for connection of the remote control panel / wireless remote control / ACS controller inputs and the emergency unblocking device — “XT1.L” (In);
- Clamp for connection of the siren and the ACS outputs, providing the turnstile status data to the ACS controller — “XT1.H” (Out);
- Intrusion detector clamp — “XT2” (Detector);
- Turnstile power supply clamp — “XT3” (+12VDC);
- Remote indicator clamps (open / closed, one indicator per each direction) — “XT4” and “XT5” (Light A and Light B accordingly);
- J1 connector for turnstile control selection (see below);
- J2 connector for programming.



**Fig. 3. Control Logic Board (CLB)**

## 6. CONTROL OF THE TURNSTILE

### 6.1. Control devices of the turnstile

6.1.1. Control of the turnstile can be achieved with the help of the following devices:

- Remote control panel;
- Wireless remote control;
- ACS controller.

The above devices can be connected to the turnstile as follows:

- All together simultaneously;
- One of devices separately;
- In any combination with each other.

**Note.** At the simultaneous (parallel) connection of the above devices to the turnstile the superposition of control signals may occur. In that case the turnstile response will conform to response to the obtained combination of input signals.

6.1.2. Connection of the stipulated in Clause 6.1.1 devices is made with cable (13) to the corresponding connector blocks "XT1.L" or "XT1.H" of the CLB (See Fig. 3) in accordance with the connection layout (See Fig. 4).

6.1.3. The remote control panel is connected to the contacts GND, Unlock A, Stop, Unlock B, Led A, Led Stop and Led B of the "XT1.L" connector block.

6.1.4. The wireless remote control is connected to the contacts GND, Unlock A, Stop and Unlock B of the "XT1.L" connector block. Power supply of the wireless remote control is connected to the contact +12V of the "XT1.H" connector block.

6.1.5. ACS controller outputs are connected to the contacts GND, Unlock A, Stop and Unlock B of the "XT1.L" connector block.

6.1.6. ACS controller inputs are connected to the contacts Common, PASS A, PASS B, Ready and Det Out of the "XT1.H" connector block.

6.1.7. Pin assignments of those connector boards are given on the CLB and on the label on the turnstile frame sidewall under the left-side outer panel (2) (See Fig. 3).

## 6.2. Input and output signals and their parameters when operating the turnstile

6.2.1. The turnstile is operated by input of a low-level signal to the "XT1.L" connector block contacts "Unlock A", "Unlock B" and "Stop" relatively to the "GND" contact. As the control element there can be used a normally open relay contact or a circuit with open collector output at that. At the emergency unblocking device input the turnstile control is carried out by elimination of a low-level signal from the "Fire Alarm" contact relatively to the "GND" contact. As the control element there can be used a normally closed relay contact or a circuit with open collector output at that.

The control element shall provide the following characteristics:

- voltage at open contact —  $5 \pm 0.25\text{V}$ ;
- voltage at closed low - level contact (at the CLB input) — not more than 0.8V;
- minimum current — not more than 2mA;
- closed contact resistance — not more than 300 Ohm.

6.2.2. The relays "PASS A" (contacts PASS A and Common), "PASS B" (contacts PASS B and Common), "Ready" (contacts Ready and Common), "Detector" (contacts Det Out and Common) and "Alarm" (contacts Alarm 1 и Alarm 2) have normally open contacts. The "Common" contact, at that, is not connected to the CLB power supply negative terminal. In the initial state (inactive, when the power is on) the relays contacts "PASS A", "PASS B", "Ready" and "Detector" are closed (voltage is supplied to the relay coil), the relay contacts "Alarm" are broken (voltage is not supplied to the relay coil). The CLB relays operation / release is indicated by lighting / switching off of 7 red test indicators, located near the corresponding relays ("Light A", "Light B", "PASS A", "PASS B", "Ready", "Detector" and "Alarm") (See Fig. 3).

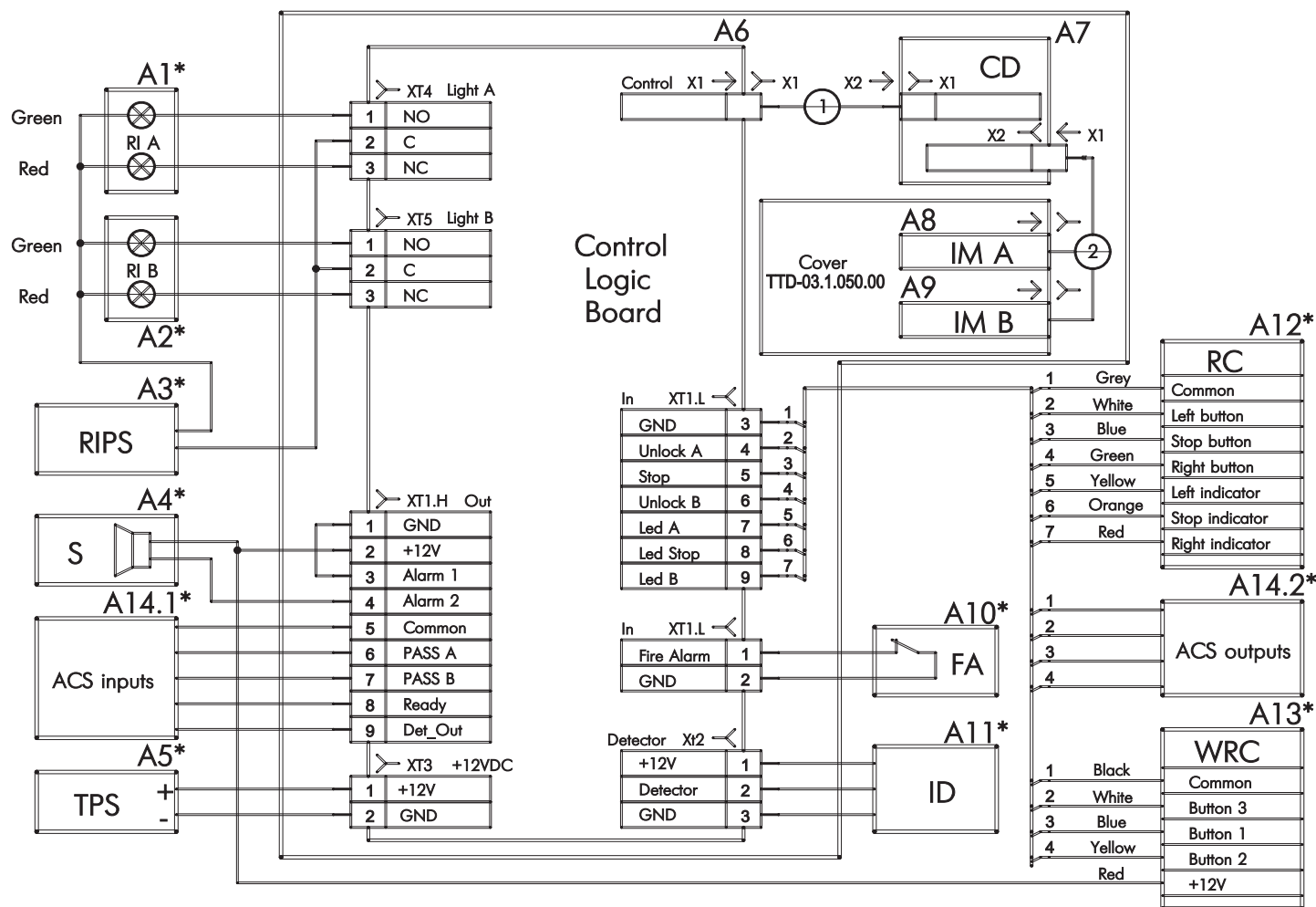
The output cascades for PASS A, PASS B, Ready, Det Out and Alarm are the contacts with the following signal characteristics:

- Maximum AC commutation voltage .....42 V;
- Maximum switched current.....0,25 A;
- Closed contact resistance ..... no more than 0,15 Ohm.

## 6.3. Operation with the remote control panel

6.3.1. When buttons (the STOP button and the two other buttons corresponding to the passage direction) on the remote control panel are pressed the closing of the relevant contact Stop, Unlock A or Unlock B to the contact GND (i.e. forming of the low-level signal relatively to contact GND) occurs.

6.3.2. The microcontroller set on the CLB, processes the received information and gives the command for the control mechanism, which unblocks or blocks the relevant passage direction or both directions.



| LEGEND   | ITEM                                           | Q-ty | NOTE   |
|----------|------------------------------------------------|------|--------|
| A1*, A2* | Remote indicators                              | 2    |        |
| A3*      | Remote indicator power supply                  | 1    |        |
| A4*      | Siren 12 V DC                                  | 1    |        |
| A5*      | Turnstile power supply                         | 1    |        |
| A6       | CLB                                            | 1    |        |
| A7       | Control mechanism                              | 1    |        |
| A8, A9   | Indication modules                             | 2    |        |
| A10*     | Alarm device giving the command for unblocking | 1    |        |
| A11*     | Intrusion detector                             | 1    | CLIP-4 |
| A12      | Remote control panel                           | 1    |        |
| A13*     | Wireless remote control kit                    | 1    | MSRF-4 |
| A14*     | Access control system                          | 1    |        |
| 1        | Turnstile cable                                | 1    |        |
| 2        | Indication cable                               | 1    |        |

\* Supplied on request

IM A, IM B — remote indicator (for directions A/B);  
ID — Intrusion detector;  
RIPS — Remote indicator power supply;  
TPS — Turnstile power supply;  
CD — Control device;  
IM A, IM B — Indication module (for directions A/B);  
RC — remote control panel;  
WRC — Wireless remote control kit;  
S — siren;  
ACS — Access control system.

**Fig. 4. Connection layout**

## 6.4. Operation with the wireless remote control

6.4.1. Operation of the turnstile with the wireless remote control is similar to that with the remote control panel.

6.4.2. The buttons on the wireless remote control tag act the same way as those on the remote control panel.

6.4.3. The operation manual for the wireless remote control is supplied within the delivery set of that item.

## 6.5. Operation with an ACS controller

6.5.1. When operating in the scope of an ACS commands to the CLB come from the ACS controller.

6.5.2. Operation of the turnstile with an ACS controller is similar to that with the remote control panel and lies in forming of low-level signal on the contacts Stop, Unlock A and Unlock B relatively to the contact GND.

6.5.3. The passage through the turnstile is registered by the optical sensors of arm rotation. The passage direction is determined according to sequence of sensors operation.

At passage in one direction (from the moment of arms turning at 67° and to the moment of their reset to home position) the output contacts "PASS A" and "Common" are broken, and at passage in the opposite direction the output contacts "PASS B" and "Common" are broken.

## 6.6. Additional devices connectable to the turnstile

6.6.1. The following additional devices can be connected to the turnstile:

- Intruder detector and siren;
- Alarm device giving command for unblocking;
- Remote indicators.

6.6.2. The intrusion detector is connected to the "XT2" connector block, and the siren is connected to the "XT1.H" connector block of the CLB according to the connections layout (See Fig. 3, 4). There should be normally closed contacts on the intruder detector.

**Note! Only the manufacturer should carry out the installation of the intrusion detector on the turnstile housing.**

If the turnstile is blocked ("Always locked" mode for pulse control or "Direction closed" (both directions) for potential control, see Tables 2 and 3 in Clause 10 of the present Manual) and a signal comes from the intrusion detector, the "Alarm" signal is generated. The "Alarm" signal is disabled after 5 sec. or by performing any received command. When the turnstile is unblocked in the chosen or both directions and within 3 sec after the "Always locked"/ "Direction closed" mode is set, the signal from the intrusion detector is ignored.

The intrusion detector status signal is constantly transmitted to the "Det Out" and "Common" contacts of the CLB "XT1.H" connector block (See Fig. 3).

6.6.3. The alarm device for emergency unblocking is connected to the "XT1.L" connector board of the CLB in accordance with the connection layout (See Fig. 3 и 4).

Please see Clauses 6.8.4 and 6.8.5 for the operation of the alarm device giving command for unblocking.

6.6.4. The remote indicators can be connected to the connector blocks "XT4" (Light A) and "XT5" (Light B). At that the output "Light A" (Light B) is active, if the "Green arrow" pictogram on the indication module (5) lights, and is not active, if the "Red cross" pictogram on the indication module (5) lights. The "Green arrow" and the "Red cross" pictograms correspond to the set passage direction.

The CLB output cascades for the signals "Light A" and "Light B" are the relay brake-make contacts with the following signal characteristics:

- maximum DC voltage — 30 V;
- maximum AC voltage — 42V;
- maximum AC/DC current — 3A;
- closed contact resistance — not more than 0.15Ohm.

## 6.7. Mechanical unblocking of the turnstile

6.7.1. Possibility to unblock the turnstile manually is specially provided for unblocking of the turnstile in the emergency mode at the power supply failure.

6.7.2. To unblock the turnstile it is necessary to insert the key (8) into the mechanical release lock (7) and turn it clockwise up to the stop (the lock cylinder moves out of the case). The barrier arms can be freely turned in both directions.

## 6.8. Control modes of the turnstile

6.8.1. There can be two **control modes** of the turnstile— **pulse** and **potential**. Those control modes determine available **operating modes** of the turnstile (See Tables 2 and 3 in Clause 10).

6.8.2. The control mode variant is set by the jumper on the J1 connector (for the J1 connector — see Fig. 3 or the label on the turnstile frame sidewall under the left-side outer panel (2)): the jumper is fixed — pulse control, the jumper is not fixed — potential control. The jumper is fixed at the factory before the delivery.

6.8.3. Control of the turnstile is effected by input of the controlling signal to the turnstile in both control modes. The passage waiting time in the pulse control mode is 5 seconds at that and it does not depend on the controlling signal (pulse) duration. In the potential control mode the passage waiting time is equal to the duration of controlling signal.

6.8.4. The pulse control mode is intended for the turnstile control from the remote control panel, the wireless remote control and ACS controller, which outputs support the pulse control mode.

Standard control inputs: Unlock A, Unlock B, Stop.

Special control inputs: Fire Alarm.

See Table 2 for the turnstile operating modes at this control mode.

The minimum input signal duration, when the operating mode can be changed, shall be not less than 100msec. The passage waiting time is 5 sec. and does not depend on the input signal duration.

At the low-level signal elimination from the “Fire Alarm” input, both directions are open. All the other control commands are ignored. At the low-level signal input to the “Fire Alarm” input the turnstile turns to the “Always locked” mode. If the “Fire Alarm” input is not used, a jumper shall be set between the contacts “Fire Alarm” and “GND”. The jumper is fixed at the factory before the delivery.

6.8.5. The potential control is intended for the turnstile control from the wireless remote control and the ACS controller, which outputs support the potential control mode (for example, lock controllers).

Standard control inputs: Unlock A, Unlock B

Special control inputs: Stop, Fire Alarm.

See Table 2 for the turnstile operating modes at this control mode.

The minimum input signal duration, when the operating mode can be changed, shall be not less than 100msec. The passage waiting time is equal to the input signal duration (if a low-level signal is presented at the set direction input after the passage in the set direction is effected, the turnstile remains open in the set direction).

At the low-level signal input to the “Stop” input, both directions are closed regardless the signal strength at the inputs “Unlock A” and “Unlock B”. At the low-level signal elimination from the “Stop” input, the directions are set to the mode according to the signal strength at the inputs “Unlock A” and “Unlock B”.

At the low-level signal elimination from the “Fire Alarm” input, both directions are open. All the other control commands are ignored. At the low-level signal input to the “Fire Alarm” input, the directions are set to the mode according to the signal strength at the inputs “Unlock A”, “Unlock B” and “Stop”. If the “Fire Alarm” input is not used, a jumper shall be set between the contacts “Fire Alarm” and “GND”. This jumper is fixed at the factory before the delivery.

## **6.9. Operation contingencies and response**

6.9.1. The turnstile is capable to provide information on the following operation contingencies:

- unauthorized access;
- passage delay for more than 30 sec;
- one or both optical sensors of arm rotation out of order.

A special signal “Ready” is formed in each of the above cases.

6.9.2. In case of unauthorized access signal “Ready” is formed as follows. At arm rotation at 8° one of the optical sensors (See Fig. 9) the output contacts Ready and Common are broken (beginning of the signal). When the barrier arms reset into initial state the both the optical sensors are normalized and the output contacts Ready and Common are closed (finish of the signal).

6.9.3. In case of delay of an authorized passage for more than 30 seconds the signal “Ready” is formed as follows. If within 30 seconds from the moment of passage commencing, which is determined by the arm rotation at not less than 8° (i.e. activation of one of the optical sensors), the reset of barrier arms to the initial state does not happen, the output contacts Ready and Common break (beginning of the signal). When the barrier arms reset into initial state the both the optical sensors are normalized and the output contacts Ready and Common are closed (finish of the signal).

6.9.4. When one or both of the optical sensors are out of order the output contacts “Ready” and Common are broken (beginning of the signal “Ready”). After elimination of the fault the closed state of contacts “Ready” and “Common” is renewed.

## **7. MARKING AND PACKAGING**

The turnstile has the following marking:

- on the turnstile housing — a label located inside on the rear panel of the turnstile housing. To get access to the label, remove the turnstile housing cover (1) by unlocking the turnstile housing cover lock (9) with the key (10) and turning it clockwise up to the stop (the lock cylinder moves out of the case). Shift the cover to the right up to the stop (slight push is allowed). Lift the cover and carefully remove it. Be careful! The indication modules (5), located on the turnstile housing cover, are connected to the control device with cables, which shall be disconnected. Place the turnstile housing cover on the steady and level surface.
- a label corresponding to Fig. 3. To get access to the label, remove the turnstile housing cover (1). Unscrew two M6 screws, fixing the upper parts of the left-side outer panel (2). Lift the outer panel and carefully remove it.

The outer panel and the turnstile housing cover mounting is carried out in the reverse order.

The turnstile in the delivery set (See Chapter 4) is packed into 1 shipping containers, which keep it undamaged during the transportation and storage.

Box overall dimensions (length x width x height) — 1136x376x1090mm

## **8. SAFETY REQUIREMENTS**

### **8.1. Installation safety requirements**

- The installation should be carried out only by the qualified personnel after the careful study of this Manual.
- Use only the serviceable tools for installation.
- All the connectors should be connected up when the power supply is switched off from the AC mains.
- Observe general electrical safety rules when laying out the cables.
- Safety requirements on the power supply installation see the Power supply certificate.

## 8.2. Operation safety requirements

- Observe general electrical safety rules when operating the turnstile.
- Do not use the turnstile under conditions that do not comply with the requirements of Chapter 2 of this Manual.
- Do not use the turnstile at supply voltage that does not comply with the requirements of Chapter 3 of this Manual.
- Safety requirements on the power supply operation see the Power supply certificate.

## 9. INSTALLATION INSTRUCTIONS

### 9.1. 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 lie in the same plane;
- to apply reinforcing elements (400x400x400mm) for installation on less steady foundation;
- to mark the mounting holes according to Fig. 6;
- to control the vertical position of the turnstile during installation;
- when creating the passage area through the turnstile take into account that the resetting device operates as follows:
  - at the barrier arm turning at the angle of more than  $60\pm 5^\circ$  the reset to home position is effected in the direction of movement;
  - at the barrier arm turning at the angle less than  $60\pm 5^\circ$  the reset to home position is effected in the counter to the movement direction (reset to home position).
- to carry out installation by means of not less than two people which possess qualifications of skilled electrician and installer.

To ensure accurate passage tracking, when the turnstile is operated from the ACS, it is recommended to create the passage area in such a way that the barrier arms turning in the direction of movement must be at the angle not less than  $70^\circ$  (See Fig. 5).

### 9.2. Installation tools

- 1.2÷1.5kW perforator;
- $\varnothing 16$ mm hard-alloyed drills for anchor bolts;
- Bail for electric raceway;
- Cross-head screwdriver No. 2;
- Flat slot screwdriver No. 5 (150mm);
- Horn-type and socket wrenches S17, S13, S10, S8, S7;
- Plumb line and level;
- Measuring tape (2 m);
- Slide caliper.

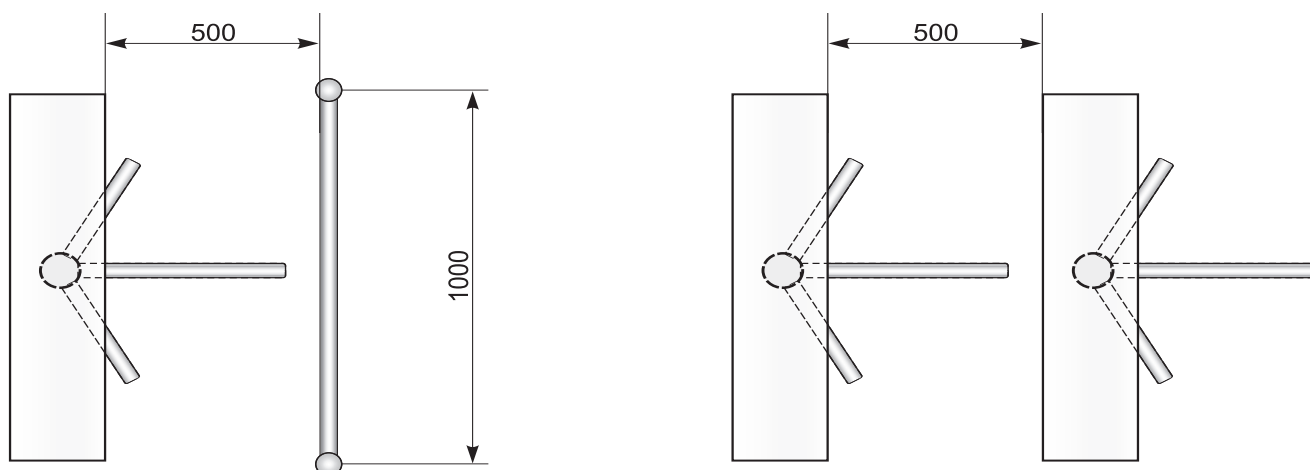
**Note.** Other metering and installation tools are allowed to be applied.

### 9.3. Cable lengths

The maximum allowed length of the remote control panel / wireless remote control kit / ACS controller cable is not more than 50m.

The maximum allowed length of the turnstile power supply cable depends on the cable cross-section and shall be:

- for cable with  $0.2\text{mm}^2$  cross section (AWG 24) — not more than 10m;
- for cable with  $0.75\text{mm}^2$  cross section (AWG 18) — not more than 25m;
- for cable with  $1.5\text{mm}^2$  cross section (AWG 16) — not more than 50m.



**Fig. 5. Recommendations on creation of the passage area**

#### 9.4. 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.**

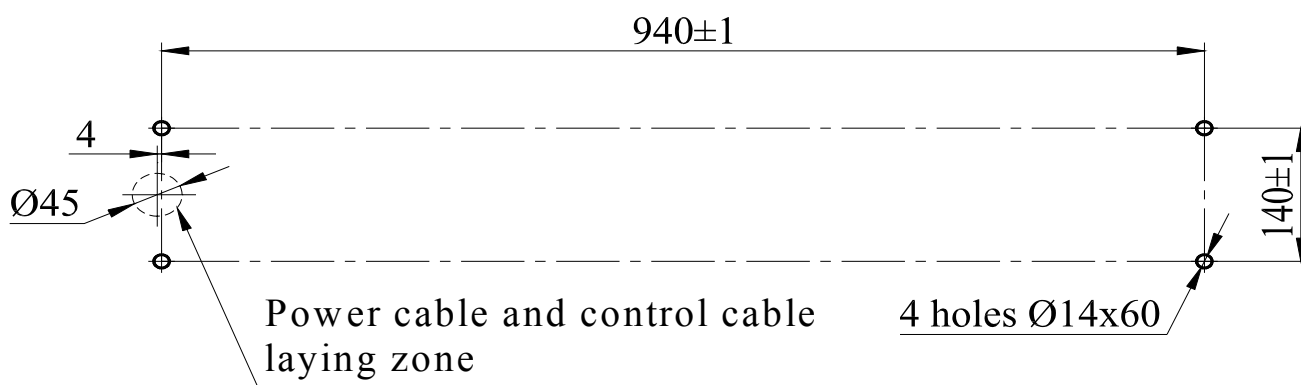
All the positions are set in accordance with Figure1.

Recommendations on making holes are given with regard to use of «SORMAT» anchors for strong concrete floors (See Table 1).

Table 1

| Type of anchor | Drill diameter, mm | Drilling depth, mm |
|----------------|--------------------|--------------------|
| PFG IR 10-15   | 16                 | 60                 |

9.4.1. Unpack the turnstile; check the completeness of the delivery set as per Chapter 3 of the Certificate. 9.4.2. Drill the holes for anchor bolt sleeves and electric raceway for cables in the floor (see Fig. 6).



**Fig. 6. Hole pattern for the turnstile housing mounting**

9.4.3. If cables (13) and (14) are to be laid under the floor surface get ready the cable duct leading to the connection area of those cables on the turnstile housing (See Fig. 6).

9.4.4. Make holes for the anchor bolts to fix the turnstile housing as per Clause 9.4.2.

9.4.5. Insert the sleeves for the anchor bolts into the holes so that they do not stick out above the floor surface.

9.4.6. To get an access to the mounting holes of the turnstile housing base (4) remove the turnstile housing cover (1) and both outer panels (2) (see Chapter 6). Thus you get an access to the mounting holes of the turnstile housing base (4).

9.4.7. Mount the turnstile housing above the anchor bolt sleeves and fix it with the M10 anchor bolts with the help of S17 box spanner. The final fixation of the turnstile housing should be done after the cables (13, 14) are laid.

9.4.8. The CLB connections are carried out according to the connection layout (see Fig. 4). The turnstile housing cable layout is shown in Fig. 7.

9.4.9. Install the turnstile power supply (11) on its place (installation procedure for the turnstile power supply is given in the Power supply certificate).

9.4.10. Connect the power cable (14) from the turnstile power supply (11) to the CLB "XT3" connector block. Connect the remote control panel (12) cable (13) to the CLB "XT1.L" connector block. Connect all the other devices cables to the corresponding CLB clamps (see Fig. 3, 4). When connecting an alarm device for emergency unblocking, take off the jumper between contacts Fire-Alarm and GND of the "XT1.L" connector block (In).

9.4.11. If the turnstile is intended for use in the potential control mode take off jumper from connector J1 (See Fig. 3).

9.4.12. Check serviceability and accuracy of all the electrical connections. Fasten all the cables using self - adhesive wires retainers and fixed brace rods, included in the delivery set. After all the cables connections and the turnstile housing fastening to the floor mount the outer panels (2) back into their places in the reverse order.

9.4.13. To install the turnstile housing cover (1) put it so that the middle bar on the cover lower part is situated from the cover lock side (9). Connect indication cables to the indication module connectors (5), then gently put the turnstile housing cover (1) onto the frame (3). The transverse angles on the cover should be located as close as possible to the corresponding bolt leads in the frame (3). To put the cover (1) into operating position move it from right to left up to the stop and press it. Then fix the cover with the turnstile housing cover lock (9). The turnstile housing cover lock (9) can be locked without a key just by pressing the pin cylinder up to the stop.

9.4.14. To mount the barrier arms into the run position remove the cover (17) from the hub (16), unscrewing the screw (18). Unscrew the fixing bolt (19) on the barrier arm (6). Fit the barrier arm into the mounting hole on the hub (16) and fasten it with the bolt (19). Put a spring washer under the bolt head. The bolts must be tightened so as to provide reliable fixation of the barrier arms without a gap.

Repeat the above — described procedure for fitting up the remaining barrier arms. Put the cover (17) onto the hub (16) and fix it with the screw (18).

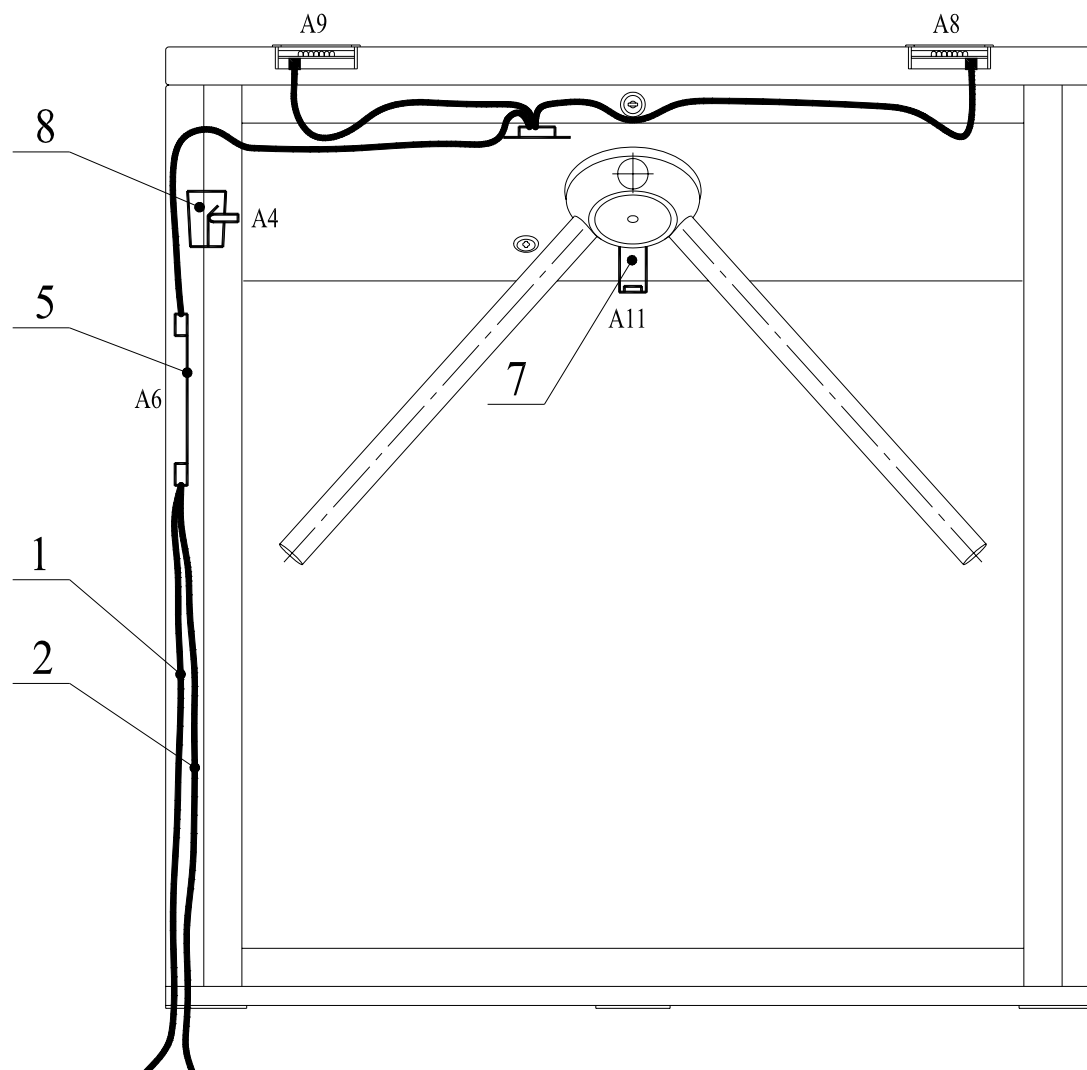
The turnstile housing installation is completed.

9.4.15. Check the fixation of the turnstile housing, of the barrier arms and of the electric connections.

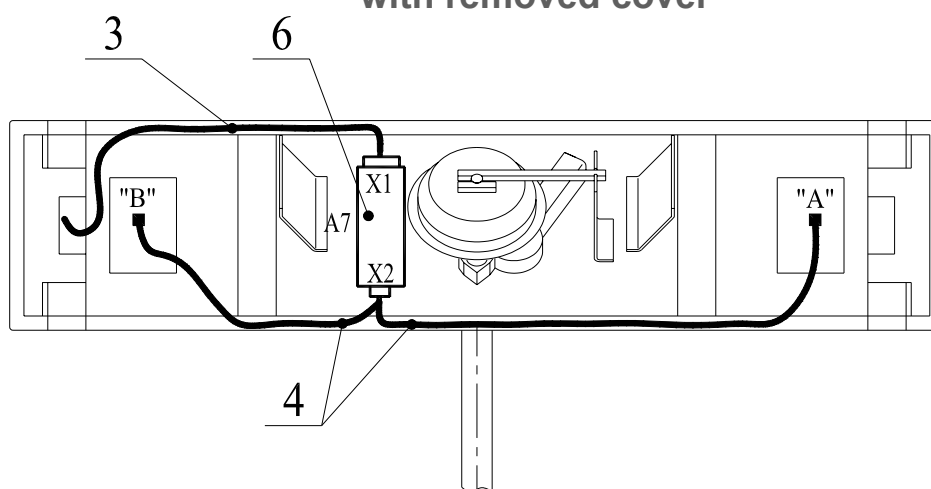
9.4.16. Run a test switch on of the turnstile as specified in Chapter 10. Check operation of the intrusion detector and the siren (if included in the delivery set).

After the power-up wait until the moment of the test indicator (inside the intrusion detector) going off (from 10 to 50 seconds, the turnstile should be in the "Always locked" mode (at the pulse control mode) or in the "Both directions closed" (at the potential control mode)). Put your hand before the intrusion detector. The continuous signal will sound when the intrusion detector activates. To eliminate that sound signal press any button on the remote control panel. The sound will stop without pressing the button in  $5 \pm 0.5$  seconds.

9.4.17. Once the checking is completed, the turnstile is ready for operation.



Turnstile housing  
with removed cover



**Fig. 7. Cables layout inside the turnstile housing:**

1 — power supply cable; 2 — remote control panel / wireless remote control kit / ACS controller cable; 3 — turnstile cable; 4 — indication cable; 5 — CLB; 6 — control mechanism; 7 — intrusion detector; 8 — siren. See Figure 4 for positions A7 – A9, A11.

## 10. OPERATION INSTRUCTIONS

### 10.1. Power-up

**WARNING!** Observe general electrical safety requirements during the turnstile operation

Check the accuracy of all the connections and the power supply cable operability (See Clause 9.4.10 of this Manual).

Connect the AC power cable (15) of the turnstile power supply (11) to the AC outlet with the voltage and frequency rating according to the Power supply certificate.

**WARNING! Do not connect the turnstile power supply to the mains with the voltage and frequency rating other than specified in the Power supply certificate.**

Switch on the turnstile power supply (11). At the same time the pictogram “Red cross” on the indication modules (5) of the turnstile housing and the indicator above the STOP button on the RC (12) light up.

### 10.2. Operating modes at pulse control mode

See Table 2 for the operating modes set with the remote control panel. Please note the following:

- Setting the operating modes for each direction is independent: setting the operating mode for one direction does not change the operating mode set earlier for the opposite one.

- The “Single passage in the set direction” mode can be changed to the “Always free” mode for the same direction, or to the “Always locked” mode.

- The “Free passage in the set direction” mode can be changed to the “Always locked” mode only.

At the turnstile power supply switching on the turnstile initial state is closed (the mechanical release lock (7) is locked with the key (8)).

In the “Single passage in the set direction” mode the turnstile will close automatically after a person’s passage in the set direction. The turnstile will also close automatically, if the passage is not affected within 5 sec. In the “Bidirectional single passage” mode after the passage in one direction the countdown of the passage waiting time (5 sec) for the opposite direction is recommenced.

**Note.** Pressing the button on the remote control panel corresponds to the low-level signal supply to the contacts (Unlock A, Unlock B и Stop) of the “XT1.L” connector block relatively to the contact GND.

#### **WARNING! IT IS PROHIBITED:**

- to use abrasive or chemically active substances for cleaning the external surfaces;
- to move through the turnstile passage area any objects with dimensions exceeding the width of the passageway;
- to jerk or hit barrier arms, turnstile housing and indication modules so as to prevent their mechanical deformation.

Table 2

## Pulse control mode (the jumper is set on the connector J1)

| No | THE TURNSTILE OPERATING MODES                                                                                                                                                       | ACTIONS TO DO                                                                                            | INDICATION ON THE RC                                                       | INDICATION ON THE TURNSTILE HOUSING DISPLAY                                                                             | RESPONSE TO THE BARRIER ARM TURNING                                                                                                                                                                                                                              |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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                       | The two “Red cross” pictograms (left and right) are on                                                                  |                                                                                                                                                                                                                                                                  |
| 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 is on | The “Green arrow” pictogram, showing the passage direction, and the “Red cross” pictogram from the opposite side are on | Turnstile is blocked                                                                                                                                                                                                                                             |
| 3  | Bidirectional single passage (open for one-by-one person passage in each direction)                                                                                                 | Press both the left and right side buttons on the RC simultaneously                                      | The two green indicators (left and right) are on                           | The two “Green arrow” pictograms (left and right) are on                                                                | Turnstile is blocked for passage in the set direction                                                                                                                                                                                                            |
| 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 | The “Green arrow” pictogram, showing the passage direction, and the “Red cross” pictogram from the opposite side are on | Turnstile remains open in the set direction                                                                                                                                                                                                                      |
| 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 (left and right) are on                           | The two “Green arrow” pictograms (left and right) are on                                                                | After the passage in the free passage direction the turnstile remains open in both directions. After the passage in the single passage direction the turnstile remains open in the free passage direction but it is gets blocked in the single passage direction |
| 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                           | The two “Green arrow” pictograms (left and right) are on                                                                | Turnstile remains open                                                                                                                                                                                                                                           |

### 10.3. Operating modes at potential control mode

– See Table 3 for the operating modes set with the remote control panel. Setting the operating modes for each direction is independent, i.e. setting the operating mode for one direction does not change the operating mode set earlier for the opposite one.

Table 3

#### Potential control mode (the jumper is taken off from the connector J1)

| No | THE TURNSTILE OPERATING MODES                                                                  | ACTIONS TO DO                                                                                                        | INDICATION ON THE RC                                                       | INDICATION ON THE TURNSTILE HOUSING DISPLAY                                                                             | RESPONSE TO THE BARRIER ARM TURNING                                                                                                                           |
|----|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Both directions are closed (the turnstile is blocked both for entry and exit)                  | The buttons corresponding to the passage directions are not pressed                                                  | The red indicator above the <b>STOP</b> button is on                       | The two “Red cross” pictograms (left and right) are on                                                                  |                                                                                                                                                               |
| 2  | One of the passage directions is open (the turnstile is open for passage in the set direction) | Press the RC button corresponding to the chosen passage direction, keep the button pressed                           | The green indicator above the button of the chosen passage direction is on | The “Green arrow” pictogram, showing the passage direction, and the “Red cross” pictogram from the opposite side are on | If the button corresponding to the set passage direction is kept pressed by the moment of passing through the turnstile, it remains open in the set direction |
| 3  | Both passage directions are open (the turnstile is open for passage in both directions)        | Press the two RC buttons corresponding to both passage directions (left and right buttons), keep the buttons pressed | The two green indicators (left and right) are on                           | The two “Green arrow” pictograms (left and right) are on                                                                | If the button corresponding to the set passage direction is kept pressed by the moment of passing through the turnstile, it remains open in the set direction |

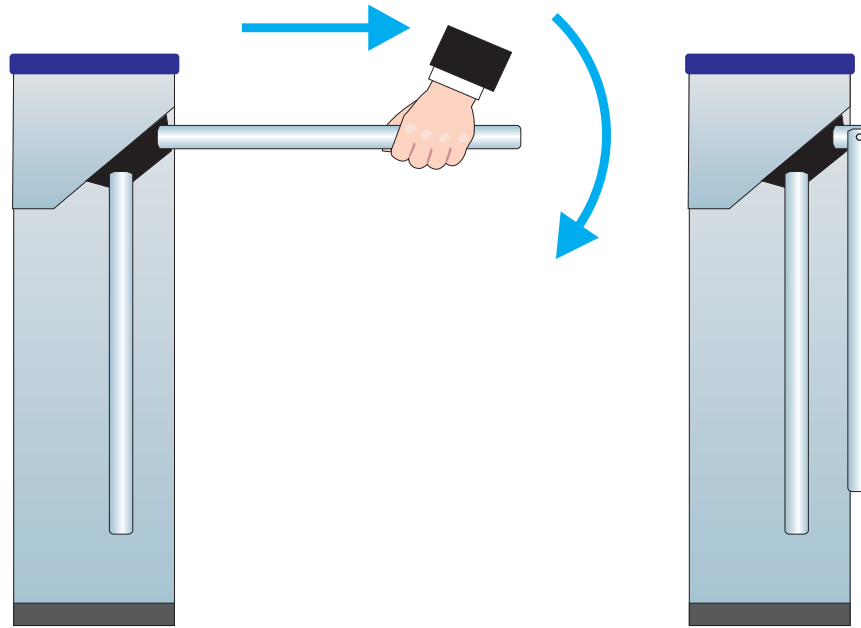
**Note.** Pressing the button on the remote control panel corresponds to the low-level signal supply to the contacts (Unlock A, Unlock B и Stop) of the “XT1.L” connector block relatively to the contact GND.

### 10.4. Actions in emergency

For urgent evacuation of people from business facilities in case of fire, natural calamities and other emergencies, the additional emergency exit should be provided. The anti-panic barrier section of rotary type can be used as an emergency exit.

The additional emergency exit can be provided by the turnstiles equipped with anti - panic drop arms. The anti - panic drop arms allow to set the passageway free without any special keys or tools. To drop the anti - panic arm down just pull out the arm towards its axis direction, until the rotation mechanism is free, and then turn down (See Fig. 8).

When using the standard barrier arms, it is possible to provide free passage through the turnstile by unblocking it with the mechanical release key. The sequence of actions is described in Clause 6.7.



**Fig. 8. Anti-panic drop arms application**

## 10.5. Troubleshooting

Possible faults, which can be cleared by the users themselves, are listed in Table 4.

Table 4

**Possible faults and remedy**

| FAULT                                                                                                                          | POSSIBLE CAUSE                                                | REMEDY                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| At the power-up the turnstile won't work, and there is no light indication on the turnstile housing and the RC                 | No supply voltage to the CLB                                  | Switch off the turnstile power supply from the AC mains, open the turnstile housing cover, and remove the outer panel. Check the power cable serviceability and reliability of its connection to the CLB "XT3" connector block                                                                              |
| The turnstile is not controlled in one of the directions, and there is light indication on the turnstile housing and on the RC | The CLB does not receive a control signal from this direction | Switch off the turnstile power supply from the AC mains, open the turnstile housing cover, and remove the outer panel. Check the remote control panel / wireless remote control kit / ACS controller cable serviceability and reliability of its connection to the CLB "XT1.L" and "XT1.H" connector blocks |

In the event of any other malfunctions contact the Manufacturer's representative.

## 11. MAINTENANCE

The turnstile maintenance is required once a year or in case of some technical failures. The maintenance should be carried out only by qualified mechanic. Prior to the turnstile maintenance disconnect the turnstile power supply from the AC mains.

Remove the turnstile housing cover (1):

- unlock the turnstile housing cover lock (9) with the key and turn it clockwise up to the stop (the lock cylinder moves out of the case);
- shift the turnstile housing cover to the right up to the stop (slight push is allowed).

Lift the cover and turn it over to gain the access to the indication modules connectors;

- disconnect indication cables connectors from the corresponding indication modules;
- place the turnstile housing cover on the level and steady surface;
- unscrew the M6 screws, fixing both outer panels (2) upper parts, and then remove the outer panels by lifting them up.

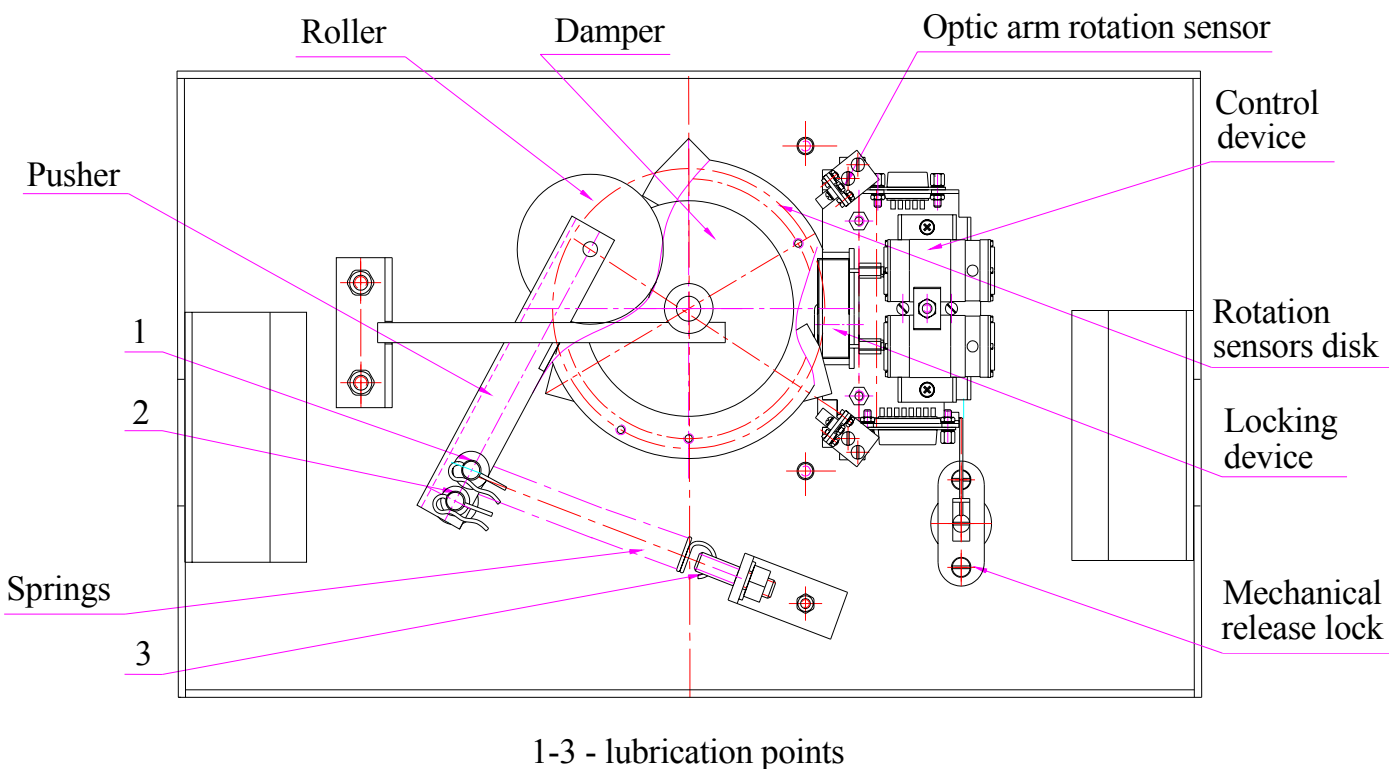
Check visually the resetting device (the pusher, the springs and the roller), the optic arm rotation sensors and the damper (see Fig. 10). Remove dust from the rotation sensors disk, located in the spacing of the optic arm rotation sensors, with alcohol - gasoline blend applied with a cloth. Avoid the ingress of dust on the operational spacing of the both optic arm rotation sensors.

Lubricate the friction units of the resetting device with the machine oil:

- four bushes of the resetting device (two — on the rotation axis of the pusher, two — on the fastening axis of the springs);
- holes in the fastening parts of the springs;
- lock cylinder of the mechanical release lock (7) through the keyhole;
- lock cylinder of the turnstile housing cover lock (9) through the keyhole.

Avoid the ingress of lubrication on the rotation sensors disk and the pusher's roller surfaces.

Check the reliability of the cables connection to the CLB clamps, if necessary, tighten the cables fixing screws.



**Fig. 9. Location of the interior components of the turnstile housing**

Check the reliability of the barrier arms (6) fastening and, if necessary, tighten the bolts (19) of the barrier arms. To tighten the fixing bolts:

- remove the cover (17) from the hub (16) of the turnstile housing, unscrewing the screw (18);
- tighten the bolts (19) of the barrier arms (6) with the S13 socket wrench;
- put the cover (17) onto the hub (16) and fix it with the screw (18).

Check the reliability of the turnstile housing fastening to the floor and, if necessary, tighten the base (4) fixing bolts with the S17 socket wrench.

At the end of the maintenance works:

- mount the outer panels (2) of the turnstile back into their places;
- mount the turnstile housing cover (1) in the reverse order as described above.

The housing cover mounting does not need much effort.

In case of any defects revealed during visual check please apply to PERCo Technical Support Department.

## **12. TRANSPORTATION AND STORAGE**

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

The storage of the turnstile is allowed indoors at ambient temperature between – 40°C and + 40°C and at relative air humidity up to 98% at +25°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.

It is not allowed to stack boxes while in transit.