Electromechanical Box Tripod Turnstile with Automatic Anti-Panic Arms and Capability of Additional Equipment Installation

**TTD-10A**

ASSEMBLY AND OPERATION MANUAL
Electromechanical Box Tripod
Turnstile with Automatic Anti-Panic Arms and Capability of Additional Equipment Installation

TTD-10A

Assembly and Operation Manual
Dear Customer,

Thank you for purchasing the PERCo turnstile. Please follow the instructions given in the Manual carefully, and this quality product will provide many years of trouble-free use.

Assembly and Operation Manual (hereinafter - the Manual) for the **TTD-10A electromechanical tripod turnstile with automatic anti-panic folding arms and capability of additional equipment installation** contains data that is necessary for the fullest use 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;
- RC-panel – remote control panel;
- WRC – wireless control panel;
- CLB – control logic board.

1 APPLICATION

The **TTD-10A electromechanical box tripod turnstile with automatic anti-panic folding arms and capability of additional equipment installation** (hereinafter - the turnstile) is designed for the organization of a two-way access point to the controlled area. A distinctive feature of this product is its modularity, which makes it possible to integrate a wide range of additional equipment into the turnstile: card capture reader, coin acceptor, proximity card readers, biometric readers, barcode readers, alcohol detector etc.

Housing of the turnstile is made of stainless steel. Outdoor application is allowed (in standard version).

To ensure fast and convenient passage it is recommended to install one turnstile per 500 people working the same shift, and on the basis of maximum working load 30 persons / min (see Chapter 3) for information on the throughput capacity of the turnstile.
2 OPERATION CONDITIONS

The turnstile with regard to resistance to environmental exposure complies with GOST15150-69, category N1 (for an outdoor application).

Operation of the turnstile is allowed at ambient air temperature from –20°C to +50°C (when used under the canopy – to + 55°C) and at relative air humidity of up to 90% at +30°C.

Attention!

The modification with card capture reader or coin acceptor can be operated indoors at ambient air temperature from +1°C to +55°C and at relative air humidity up to 95% at +25°C.

The RC-panel, included in the standard delivery set, with regard to resistance to environmental exposure complies with GOST15150-69, category NF4 (operation in premises with climate control).

Operation of the RC-panel is allowed at ambient air temperature from +1°C to +40°C and at relative air humidity of up to 80% at +25°C.

When installing other additional equipment, the installer must take into account the operating conditions of the installed equipment.

Figure 1. Overall dimensions of the TTD-10A turnstile
3 TECHNICAL SPECIFICATIONS

Operating voltage ........................................................................................................ 12±1.2VDC
Consumption current ................................................................................................... max. 7.0 A \(^1\)
Power consumption ................................................................................................. max. 84 W \(^2\)
Throughput rate in a single passage mode ..................................................... 30 persons/min
Throughput rate in a free passage mode .................................................... 60 persons/min
Passage width ......................................................................................................... 560 mm
Barrier arm rotation force .................................................................................... max. 3 kgf
RC-panel cable length \(^3\) ................................................................................... min. 6.6 m
Card container capacity \(^4\) .................................................................................. 350 card
Coin container capacity \(^5\) ................................................................................ not less than 2 000 coins
Ingress Protection Rating (EN 60529):
  standard version ..................................................................................................... IP55
  with built-in card capture reader ......................................................................... IP41
  with built-in coin acceptor .................................................................................. IP54
Electric shock protection class ........................................................................ III (IEC 61140)
Mean time to failure .................................................................................. min. 1,500,000 passages
Mean lifetime ........................................................................................................... 8 years
Overall dimensions (L × W × H)\(^6\) ......................................................... 1361×750×1024 mm
Net weight of the turnstile .................................................................................... max. 100 kg

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\(^1\) It is recommended to use 12 VDC (max. consumption current 8A) power supply with linear stabilization of voltage and pulsation amplitude at output not exceeding 50 mV.

\(^2\) The power consumption can rise to 84W within 5 sec. after power up or at taking off the Fire Alarm signal. In normal state the power consumption is no more than 40 W.

\(^3\) Max. allowed cable length – 40 m (supplied on request).

\(^4\) For turnstile version with built-in card capture reader.

\(^5\) For turnstile version with built-in coin acceptor.

\(^6\) Overall dimensions are shown in Fig.1.
4 DELIVERY SET

4.1 Standard delivery set

Box №1. Main housing TTD-10A
Turnstile main housing with hub and barrier arms .............................................................. 1
RC-panel with cable ............................................................................................................ 1
Installation tools:
  Self-adhesive cable tie mount ....................................................................................... 3
  Nylon cable tie 100 mm ................................................................................................. 6
  Self-adhesive PCB pillars FSS-5 .................................................................................... 4
Technical documentation:
  Certificate ...................................................................................................................... 1
  Assembly and operation manual ................................................................................... 1

Box №2. Side modules

TTD-10AB (standard version):
  Standard side module, right .......................................................................................... 1
  Standard side module, left ............................................................................................. 1

TTD-10AC (version with built-in card capture reader):
  Side module with built-in card capture reader, right .................................................... 1
  Standard side module, left ............................................................................................. 1

TTD-10AP (version with built-in coin acceptor):
  Side module with built-in coin acceptor, right ............................................................ 1
  Standard side module, left ............................................................................................. 1

Packing №3. Side cover
C-10 side cover............................................................................................................... 1

Packing №4. Side cover
C-10 side cover............................................................................................................... 1

Attention!

The side covers are a separate item in the price list and are purchased separately, the type of cover is chosen by the customer when ordering the turnstile. Types of side covers and their application are shown in Table 1. Design and dimensions of different types of covers - see Appendix 1.
### Table 1. Types and application of serially produced side covers for TTD-10A turnstiles

<table>
<thead>
<tr>
<th>Type</th>
<th>Design</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-10B</td>
<td>from stainless steel</td>
<td>without additional functions</td>
</tr>
<tr>
<td>C-10R</td>
<td>with a window from radio-transparent material</td>
<td>for built-in RFID reader installation</td>
</tr>
<tr>
<td>C-10A</td>
<td>with a bracket and a window from radio-transparent material</td>
<td>for alcohol detector and integrated RFID reader installation</td>
</tr>
<tr>
<td>C-10Q</td>
<td>with a window of transparent tinted glass</td>
<td>for integrated bar code reader installation</td>
</tr>
<tr>
<td>C-10F</td>
<td>with a bracket</td>
<td>for biometric reader installation</td>
</tr>
<tr>
<td>C-10C</td>
<td>with a slot for cards</td>
<td>for use with TTD-10AC turnstile with card capture reader</td>
</tr>
</tbody>
</table>

### 4.2 Optional equipment supplied on request

**Optional equipment ¹:**

- Power supply unit ², 12VDC/8A................................................................. 1
- WRC kit ³ .................................................................................................. 1
- Cable for connection the coin acceptor to the computer (WEL-R7U06) ............. 1

**Optional installation tools:**

- SORMAT anchor PFG IR 10-15 ........................................................................ 4

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¹ Technical specifications of optional devices are given in corresponding documentation to the same devices.

² The power supply source must have load current min. 8A within 5 sec.

³ WRC kit consists of a receiver and transmitters (tags) with operation range up to 40 m.
5 PRODUCT DESCRIPTION

Figure 2. TTD-10A turnstile overall view
Legend of Fig.2:

1 – main housing;
2 – main cover;
3 – main cover indication block;
4 – cover lock;
5 – barrier arm;
6 – standard side module;
7 – side indication blocks of constant indication of the passage direction / prohibition;
8 – side cover\(^1\);
9 – power supply cable\(^2\);
10 – RC-panel with cable;
11 – emergency opening device (Fire Alarm)\(^2\) cable;
12 – additional devices cable;
13 – side module with built-in card capture reader;
14 – card container cover;
15 – lock of card container cover;
16 – side cover with slot for cards;
17 – side module with built-in coin acceptor;
18 – coin container cover;
19 – lock of coin acceptor cover;
20 – coin acceptor.

5.1 Main features

- The turnstile is designed either for indoor application or outdoor (see Section 2). Turnstile housing is produced from high quality stainless steel.
- The turnstile can be operated from the RC-panel or WRC as well as from an ACS.
- It is possible to install into the turnstile a wide range of additional equipment using special side turnstile modules (with built-in card capture reader or coin acceptor for corresponding turnstile versions) and special side covers to integrate into the turnstile: proximity card readers, biometric readers, bar code readers, alcohol detector etc.
- The turnstile in the version with the card capture reader is equipped with a mechanism for temporary access cards withdrawal when passing through the turnstile and a container for collecting them. The turnstile design allows you to change the location of the card capture reader to organize the passage with the withdrawal of access cards in the required direction.
- The turnstile in the version with the coin acceptor is equipped with a coin acceptance mechanism built in the side module and a container for collecting them. The turnstile design allows you to change the location of the coin acceptor to arrange payment for the passage in the required direction. The turnstile is equipped with automatic anti-panic folding arms. Automatically free of passageway is performed by bringing the barrier arm into vertical position at a power loss or by alarm signal. A purpose-designed «Fire alarm» control input is intended for opening the turnstile at the fire alarm command or from emergency opening button.

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\(^1\) The device and purpose of various types of side covers, see Table 1 and in the Appendix 1.

\(^2\) Not included in the standard delivery set.
The turnstile is equipped with automatic anti-panic folding arms. Automatically free of passageway is performed by bringing the barrier arm into vertical position at a power loss or by alarm signal. A purpose-designed «Fire alarm» control input is intended for opening the turnstile at the fire alarm command or from emergency opening button.

The turnstile houses LED indication display intended for status and passage direction indication. Besides, the turnstile has an extra indication of passage direction/ banned access on its side modules.

The turnstile has outputs for connection of remote indicators.

The turnstile has relay outputs for connection of an intrusion detector and a siren.

There are two modes for the turnstile control — a pulse control mode and a potential control mode.

After each passage the turnstile provides automatic complete rotation of the barrier arm to home position, i.e. automatic reset.

After the turn of barrier arm for more than 60° angle its reverse rotation is blocked.

Smoothness of reset and quiet operation are ensured by a damper.

The optical arm rotation sensors are built into the turnstile housing to ensure accurate count of inputs to an ACS.

The turnstile is supplied with safe voltage — maximum 14V.

Installed in a line several turnstile housings form a secured passage without installation of extra guide barriers.

5.2 Design

The design of the turnstile is shown in Fig. 2. Numbers in brackets correspond to Fig. 2. The overall dimensions of the turnstile housing are shown in Fig. 1.

The turnstile comprises a turnstile housing (1), hub with three barrier arms (5), main cover (2) with indication block (3) and lock (4), two side modules¹ with side indication blocks (7) (permanent indication of passage direction / banned access) and with side covers (8), and RC-panel (10). Fastening of barrier arms to the hub is hinged. The turnstile housing is fixed to floor with 4 anchor bolts through holes in the turnstile housing base.

5.2.1 Main housing

Internal elements of the turnstile housing are accessed through the removable main cover (2). Fastening of the cap to the housing is accomplished with the help of lock (4). During operation of the turnstile main cover has to be locked. Under the main cover there is a bracket with control panel CLB.140 (further — control panel) and remote connector blocks XTU1, XTU2, XTU3 (see Fig. 15). The indication block (3) is also integrated in the turnstile main cover and is connected to the control board with the cover indication cable via the connector block XTU3.

The rotation unit of barrier bars takes on the role of the turnstile actuation mechanism. Rotation unit consists of (see Fig. 24):

- control mechanism with optic sensors of barrier arms rotation angle, which helps to register the passage correctly;

¹ (6) – for standard version, (6) and (13) – for version with built-in card capture reader, (6) and (17) – for version with built-in coin acceptor (ref. Fig. 2).
rotation mechanism, which includes:

- barrier arms resetting unit (pusher, spring and roller), providing automatic reset of barrier arms to the home position after every passage;
- damper, providing smooth and soft-running work of rotary mechanism;
- locking device, preventing the possibility of an unauthorized passage;
- electromechanical device for emergency opening of the passageway.

To access the rotation unit of barrier arms, it is necessary to remove the main cover (3) and the bracket of control board.

### 5.2.2 Side modules

The customer has an opportunity to choose one of the turnstile options. Various versions, differing in the design of the side modules (6, 13, 17), i.e. presence / absence of the built-in card capture reader / coin acceptor, are shown in Fig.2. Side modules are rigidly fixed to the main housing (1). On top of the side modules are installed side covers (8), which can have a different functional application according to their type (see Table 1). Blocks of constant indication of the direction of passage / prohibition of passage are situated on the side modules of the turnstile (see Fig.4). Access to the four holes in the base of the housing for fixing the turnstile to the mounting surface is provided when removing the side modules.

#### Side module with built-in card capture reader

The side module (13) has a built-in card capture reader mechanism with the **PA-450** control board installed. In the side module under the cover (14), which is fixed in the locked position by the lock (15), there is a card collector with the function of signalization about its filling. The side module is equipped with a side cover (16) with a slot for capturing access cards (the possibility of replacing of this cover with a side cover of another type is not foreseen by the manufacturer). The receiving slot has a LED backlight. Use of the card capture reader is possible only in the ACS. The connection scheme is shown in Fig. 18.

#### Side module with built-in coin acceptor

A coin acceptor (20) of the **UCA2** type manufactured by **ICT** company is built-in in the side module (17). The coin acceptor is designed to receive coins (tokens) for payment of the passage without an opportunity to give change. The installation of the sorting device is not provided. Using the built-in sensors, the coin acceptor determines the denomination and / or the authenticity of the coin (token). Also, to monitor the number of passages, a pulse counter **Yenox H2-7EA2** is installed in the side module. The coin acceptor and the pulse counter must be used in accordance with the manufacturer's documentation. In the side module under the side cover (18), fixed in the closed position by the lock (19), there is a container (coin collector) with the function of signalization about its filling. For convenience of connection, the outputs and inputs of the coin acceptor are connected to the remote terminal strip **XTU4**. The scheme of the internal connections of the side module with a coin acceptor is shown in Fig. 20. It is possible to use the turnstile and coin changer without using the ACS. The connection scheme is shown in Fig. 19.
5.2.3 Indication blocks

Main cover indication block (8) are located in the main housing main cover (9) and inform about the current status and a set mode of the turnstile work (see Fig. 2, 3). The indication block has 3 mnemonic indicators:

- indicator of authorized passage (green arrow)
- indicator of passage denial (red cross)
- indicator of authorized passage in counter direction (green arrow)

Figure 3. Mnemonic indicators of the main cover indication block

Side indication block (7) is designed for showing passage direction through the turnstile. It displays the constant indication (white arrow or red cross):

- indicator of passage denial (red cross)
- indicator, showing the direction of passage (white arrow)

Figure 4. Mnemonic indicators of the side indication block

The type of the permanent indication (arrow or cross) is selected when installing the turnstile with the CROSS / ARROW jumper (see Fig.5), located in the side indication block of the side module next to the indication cable connector.

To access the CROSS / ARROW jumper, remove the side module (see Fig.15), and in the side modules with the containers (with built-in card capture reader or coin acceptor) open the cover of the container with the key.

With the initial settings, the jumper is installed in an ARROW position, which corresponds to the white arrow display.
5.2.4 RC-panel

The RC-panel (10) is designed as a small desktop device with a shock-proof ABS plastic case and is intended for setting and indicating operating modes when the turnstile is operated manually. The RC-panel overall view is shown in Fig. 6.

![Figure 6. RC-panel overall view](image)

1, 2, 3 – buttons LEFT, RIGHT, STOP for setting the passage mode;
4, 5 – green indicators «Left», «Right»;
6 – red indicator «Stop», 7 – RC cable
There are three control buttons on the RC front panel intended for setting the turnstile operating modes. The LED indicators are located above the buttons. The middle button on the RC-panel (hereinafter — the STOP button) is intended to set the turnstile to the "Always locked" mode. The left (LEFT) and the right (RIGHT) buttons are intended to unlock the turnstile for passage in the chosen direction. Control commands and corresponding indication on RC-panel for impulse and potential modes are indicated in Table 6 and 7.

5.2.5 Control Logic Board

Turnstile control board (see Fig. 7) and remote connector blocks XTU1, XTU2, XTU3 are fixed on the bracket, located inside the main housing. To access the board, it is necessary to remove the turnstile main cover, following the instructions of Section 6.

![Control Logic Board (CLB)](image)

On control board there is a microcontroller, which processes incoming control commands (inputs Unlock A, Stop, Unlock B and Fire Alarm), traces the condition of barrier arms optical sensors and basing on received data generates commands on control unit of the turnstile. Besides, microcontroller generates signals on outputs: for indication on RC-panel (outputs Led A, Led Stop and Led B), for outer indication (outputs Light A, Light B), for passing in a corresponding direction (PASS A and PASS B), for turnstile readiness to run the command (Ready), for alarm (Alarm), to retransmit the signal of intrusion detector condition (Det Out).

The CLB (Fig. 7) includes:

- **X1 (LED), X2 (SENS), X3 (MOTOR)** connectors to connect the indication blocks, optical arm rotation sensors and control mechanism with a locking device.

- **XT1.L (In)** – connector block to connect the RC-panel / WRC / ACS-controller inputs as well as an emergency opening device (Fire Alarm) and intrusion detector (see Clauses 5.3.1, 5.3.2, 5.4.1).

- **XT1.H (Out)** – connector block to connect a siren and ACS outputs, providing the turnstile status data to the ACS-controller (see Clause 5.4.1).

- **XT3 (+12VDC)** – connector block to connect the turnstile power supply.
- **XT4 (Light A)** and **XT5 (Light B)** – connector blocks to connect “open/closed” remote indicators, one indicator per each direction (see Clause 5.4.3).
- **XT6 (AntiPanic)** – connector block to connect the electromagnet of automatic anti-panic opening device.
- **J1** – connector to select the turnstile control mode, the jumper is fixed — the pulse control mode, the jumper is not fixed — the potential control mode. The jumper is fixed at the factory before the delivery (see Clause 5.2.7).
- **J2** – connector for programming.
- **Power** – power LED indicator on the control board.

For convenience, connection contacts of turnstile power supply and turnstile control units are set on the bracket on connector blocks **XTU1** and **XTU2**. Connection is conducted out in accordance to the connection diagram of the turnstile and optional equipment (see Fig. 16, 17, 18). Electric power supply is carried out through the power cable (9).

**Table 2. Contacts of the connector blocks**

<table>
<thead>
<tr>
<th>№</th>
<th>Item</th>
<th>Function of the contact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Connector blocks of the CLB.140</td>
<td></td>
</tr>
<tr>
<td></td>
<td>XT1L (In)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>+12V</td>
<td>Output of power supply for ID</td>
</tr>
<tr>
<td>2</td>
<td>Detector</td>
<td>Input for connections ID</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Common contact for connections ID</td>
</tr>
<tr>
<td>4</td>
<td>Fire Alarm</td>
<td>Input for emergency opening device</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Common contact</td>
</tr>
<tr>
<td>6</td>
<td>Unlock A</td>
<td>Inputs for turnstile control</td>
</tr>
<tr>
<td>7</td>
<td>Unlock B</td>
<td>Indication outputs of RC-panel</td>
</tr>
<tr>
<td>8</td>
<td>Led A</td>
<td>Indication outputs of RC-panel</td>
</tr>
<tr>
<td>9</td>
<td>Led B</td>
<td>Indication outputs of RC-panel</td>
</tr>
<tr>
<td></td>
<td>XT1H (Out)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>GND</td>
<td>Output of power supply for additional devices</td>
</tr>
<tr>
<td>2</td>
<td>+12V</td>
<td>Output of power supply for additional devices</td>
</tr>
<tr>
<td>3</td>
<td>Alarm 1</td>
<td>Outputs for connections siren</td>
</tr>
<tr>
<td>4</td>
<td>Alarm 2</td>
<td>Outputs for connections siren</td>
</tr>
<tr>
<td>5</td>
<td>Common</td>
<td>Common contact for PASS A, PASS B signals</td>
</tr>
<tr>
<td>6</td>
<td>Pass A</td>
<td>PASS A relay contact (passage in direction A)</td>
</tr>
<tr>
<td>7</td>
<td>Pass B</td>
<td>PASS A relay contact (passage in direction B)</td>
</tr>
<tr>
<td>8</td>
<td>Ready</td>
<td>Relay output READY (turnstile readiness)</td>
</tr>
<tr>
<td>9</td>
<td>Det Out</td>
<td>Relay output DET OUT (retransmission of intrusion detector condition)</td>
</tr>
<tr>
<td></td>
<td>XT3 (+12VDC)</td>
<td>Connection of power cable (from <strong>XTU1</strong>, cable №1)</td>
</tr>
<tr>
<td></td>
<td>XT4 (Light A)</td>
<td>Light A relay contacts – connection of remote indicator for direction A</td>
</tr>
<tr>
<td></td>
<td>XT5 (Light B)</td>
<td>Light B relay contacts – connection of remote indicator for direction B</td>
</tr>
</tbody>
</table>

15
<table>
<thead>
<tr>
<th>№</th>
<th>Item</th>
<th>Function of the contact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Out connector block XTU1</strong></td>
</tr>
<tr>
<td>1</td>
<td>+12V</td>
<td>Connection of external power supply 12VDC</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Splitter of external power supply 12VDC for additional devices</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Out connector block XTU2</strong></td>
</tr>
<tr>
<td>3</td>
<td>Fire Alarm</td>
<td>Input for emergency opening device</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>Common</td>
</tr>
<tr>
<td>5</td>
<td>Unlock A</td>
<td>Inputs for turnstile control</td>
</tr>
<tr>
<td>6</td>
<td>Stop</td>
<td>Indication outputs of RC-panel</td>
</tr>
<tr>
<td>7</td>
<td>Unlock B</td>
<td>Common contact for PASS A, PASS B signals</td>
</tr>
<tr>
<td>8</td>
<td>Led A</td>
<td>Indication outputs of RC-panel</td>
</tr>
<tr>
<td>9</td>
<td>Led B</td>
<td>Indication outputs of RC-panel</td>
</tr>
<tr>
<td>10</td>
<td>Pass A</td>
<td>PASS A relay contact (passage in direction A)</td>
</tr>
<tr>
<td>11</td>
<td>Pass B</td>
<td>PASS A relay contact (passage in direction B)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Out connector block XTU3</strong></td>
</tr>
<tr>
<td>1</td>
<td>+12V</td>
<td>Connection of indication cable from main cover (cable №4)</td>
</tr>
<tr>
<td>2</td>
<td>R</td>
<td>Connection of indication cable from right side module (cable №5.2)</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Connection of indication cable from left side module (cable №5.1)</td>
</tr>
<tr>
<td>4</td>
<td>L</td>
<td>Connection of indication cable from right side module (cable №5.2)</td>
</tr>
<tr>
<td>5</td>
<td>+7V</td>
<td>Connection of indication cable from left side module (cable №5.1)</td>
</tr>
</tbody>
</table>

### 5.2.6 Parameters of control signals

The turnstile is operated by input of a low-level signal to the XS1 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 the turnstile control is carried out by removing 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 (Fig. 8 and 9).

Emergency unblocking of the turnstile is carried out by removing of a low-level relatively to the “GND” contact signal from the “Fire Alarm” contact. As a control element there can be used a normally closed relay contact or a circuit with open collector output at that. All turnstile control commands coming to other outputs are ignored (see Clause 5.3.2). During the low signal injection on Fire Alarm output directions switch to the mode according to signal levels on inputs Unlock A, Unlock B and Stop.

Activation of intrusion detector is controlled by removing of a low-level relatively to the “GND” contact signal from the “Detector” contact. As a control element there can be used a normally closed relay contact or a circuit with open collector output at that.

**Note:**

For generation of high-level signal at all input contacts (“Unlock A”, “Stop”, Unlock B”, “Fire Alarm” and “Detector”) 2kOhm resistors connected to the power supply bus “+ 5 V” are used.
The control element must provide the following signal characteristics:
the relay contact as the control element:
  minimum switched current ..........................................................  no more than 2 mA
  closed contact resistance (with the resistance of the connected cable) ........................  no more than 300 Ohm
the circuit with open-collector output as the control element:
  voltage at the closed contact (low - level signal at the CLB input) ............................................  no more than 0.8 V

5.2.7 Control modes of the turnstile
There can be two control modes of the turnstile: pulse and potential. In both modes turnstile control is conducted by command issuing (namely by combination of control signals) on operational control inputs: Unlock A, Stop and Unlock B and special control input Fire Alarm. Depending on a chosen mode the procedure of command issuing changes (see table 6 and 7).

The control mode is set by removal / installation of the jumper on a J1 connector on control board. The J1 connector location is shown in Fig. 7. An installed jumper corresponds to the pulse control mode. In order to switch to potential mode, uninstall the jumper. The change of control mode will take place after switching on the turnstile.

Warning!
Installation and removal of the jumper is to be done only when the turnstile is switched off.
By removal of low-level signal from special control input *Fire Alarm*, turnstile switches to *Fire Alarm*, mode and therewith all incoming commands of turnstile control are ignored (see Clause 5.3.2). During low-level signal issuing at the input *Fire Alarm* command «Passage Denial» is sent and turnstile rotary mechanism is blocked.

**Pulse control mode**

The mode is used to control the turnstile with RC-panel, WRC and CLB, outputs of which support pulse control mode.

Duration of control signal during command issuing on operational control inputs should be not less than 100mc. The passage waiting time is 5 seconds and it doesn’t depend on duration of control signal (impulse).

Description of turnstile work in pulse control mode is described in Table 6. Procedure of command issuing is described in Appendix 2.

**Potential control mode**

The mode is used to control the turnstile with CLB, outputs of which support potential control mode.

Duration of control signal during command issuing on operational control inputs should be not less than 100mc.

The passage waiting time equals the duration of control signal: if by the moment of the passage in authorized direction at the entrance of this direction there is a low-level signal, then the turnstile will stay open in this direction.

At the low-level signal inputting to the “Stop” input, both directions will lock for the time of the signal duration regardless of the signal strength at the inputs “Unlock A” and “Unlock B”. By the removal of a low-level signal from the “Stop” input, the directions will set to the modes according to the signal strength at the inputs “Unlock A” and “Unlock B”.

Description of turnstile work in potential control mode is described in Table 7. Procedure of command issuing is described in Appendix 3.

**Note:**

To organize single passages in potential control mode it is advisable to remove low-level control signal from control input Unlock A / Unlock B during activation of relay output PASS A / PASS B of corresponding direction.

**5.2.8 Algorithm of the control mechanism**

Procedure of turnstile work in the pulse control mode in case of a single passage in one of directions:

1. From control unit (RC-panel, WRC, ACS) on control board inputs comes a command (combination of control commands) for execution of a single passage in one of directions.

2. Microcontroller, fixed on the control board, processes the received signal combination and forms a command to the turnstile control unit to unblock the rotary mechanism. Turnstiles hold time counting starts in the blocked mode.

3. Control mechanism unlocks the rotary mechanism for the rotation in a chosen direction. Passage in this direction becomes possible.

4. After the passage is complete, barrier arms rotation angle is monitored by microcontroller with optical sensors of control mechanism. With rotation angle of more than 67° the act of passage is registered. One of relay outputs PASS A or PASS B,
according to the direction of the passage, becomes active. Microcontroller forms the instruction to the control mechanism for blocking the turnstile rotation mechanism.

5. After the passage is complete, i.e. when barrier arms are reset to the closed position (120° rotation), turnstile rotation mechanism is blocked. Relay output PASS A / PASS B becomes normal.

6. If barrier arms rotation hasn’t started, then the command for blocking rotation mechanism is formed as hold time passes in unblocked mode (5 seconds from receiving the instruction by default).

7. Turnstile is ready for next passage.

5.2.9 Control of the built-in card capture reader mechanism

The algorithm of the card capture reader mechanism:

1. In the standby mode, the receiving slot of the card capture reader is permanently illuminated by the built-in LED indicator. The access card identificator, inserted into the receiving slot, is read by the integrated reader and sent for analysis to the external ACS controller.

2. If the presented card is a permanent employee card and does not require the withdrawal, the ACS controller allows the passage through the turnstile in the given direction (gives the appropriate signal to the turnstile control mechanism). The shutter, blocking access to the card collector, remains closed, preventing the accidental withdrawal of the card. The illumination of the card slot remains constant.

3. If the presented card is a temporary visitor card and requires the withdrawal, the ACS controller gives the control signal to the control board input of the card capture reader "Withdraw the card" (contact 3, see Fig. 10). The illumination of the card slot will start flashing with a frequency of 2 times per second, indicating that the card is to be withdrawn.

4. If, after the arrival of this signal, the optical sensor in the card capture reader records the presence of the card in the receiving slot, the electromagnet of the card capture reader opens the shutter which blocks the access to the card collector and the card falls into the card collector – the card is withdrawn. If there is no card in the receiving slot, the electromagnet will not work and the access to the card collector will remain blocked.

5. When the card falls into the card collector, the second optical sensor records the withdrawal of the card. In this case, the card reader closes the shutter, the illumination of the card slot again becomes permanent. Simultaneously from the output of the control board "Card withdrawn" (contact 5, Fig. 10) a control signal is sent, which is a confirmation of the passage for the ACS controller. After this signal, the ACS controller allows the passage in the given direction (gives the corresponding signal to the turnstile control mechanism) and after the passage through the turnstile removes the signal "Remove the card". By removing the "Remove the card" signal, the card reader removes the "Card withdrawn" signal.

6. The third optical sensor of the card capture reader tracks the fact of filling of the card collector. When it is full, the card capture reader sends an "Alarm" signal (contact 6, Fig. 10), to the ACS controller, the illumination of the receiving slot of the card capture reader goes into the flashing mode with a frequency of 1 time in 2 seconds, thereby warning about the need to free the collector from the withdrawn cards. If the collector is

---

1 Modification with side module with card capture reader
not emptied, then after receiving 10 more cards, the work of the card capture reader is blocked, the illumination of the receiving slot is extinguished. The unlocking of the card capture reader is automatically after the card collector is emptied (the algorithm of removal and installation of the card collector is given in Clause 9.5). Also, the "Alarm" signal is sent to the ACS controller in case of malfunction of the card capture reader mechanism (the illumination of the receiving slot is extinguished).

**Parameters of control signals:**

The *Capture card* input is controlled by an output of a dry contact type or open collector of the ACS controller. The input is a normally open, i.e. when a control signal is sent the ACS controller closes the input to the *GND* contact (contact 4).

The input parameters:
- Voltage at the opened contact relatively to the *GND* ......................... 5±0.5 V
- Voltage at the closed contact relatively to the *GND* ......................... max. 0.8 V
- Current through the closed contact ........................................... not exceeding 1.5 mA

The outputs *Card captured* and *Fault* – dry contact. Each of these inputs is one of 2 relay contacts. Other relay contacts are banded and connected to a *COM* output (contact 7). The outputs are normally open, i.e. when a signal is sent the corresponding output closes with the *COM* contact.

The output parameters:
- Maximum voltage between a corresponding output and the *COM* contact ....... 42 V
- Maximum switched current ............................................................ 200 mA

![Figure 10. PA-450 control board of the card capture reader](image-url)
5.2.10 Control of the built-in card coin acceptor mechanism

A coin acceptor ICT UCA2, a pulse counter Yenox H2-7EA2 and a container with a filling sensor assembly (coin acceptor) are integrated in the side module with a built-in coin acceptor. For the coordination of signals with the majority of ACS in the internal connections scheme, pull-up and limiting resistors are used.

The coin acceptor is a complex technical device, the use of the coin acceptor and the impulse counter is allowed only in accordance with the documentation of the manufacturer.

Upon delivery, the coin acceptor is programmed to accept standard Russian coins. Using a cable (RS-232 interface) and the manufacturer’s software, the coin acceptor can be programmed to receive a certain amount of money with coins of different denominations and to output one or more pulses to the turnstile CLB control board. See Appendix 4. The duration and pulse level are set by switches on the coin acceptor. To allow access, for the turnstile control board it is sufficient to receive a single low-level pulse with a duration of at least 0.25 seconds at the corresponding input.

The power supply of the side module devices with the coin acceptor is provided from the turnstile power supply in parallel with the main housing of the turnstile with a voltage of 12VDC. The internal connections of the side module with the coin acceptor are shown in Fig. 20.

The coin acceptor is connected to the ACS in compliance with the requirements of the coin acceptor manufacturer documentation and ACS controller.

It is possible to use the coin acceptor without using the ACS and additional devices. Fig. 19 shows the connection scheme of the side module devices and the main housing. Parallel connection of the remote control, radio control and coin acceptor to the control inputs of the main housing is allowed.

The coin acceptor has a blocking coin acceptance input (INHIBIT). Acceptance of coins is blocked by a low-level signal at this input.

The pulse counter counts the low-level pulses arriving at its input (channel A), i.e. number of passages. The pulse counter has a reset button.

When the coin acceptor is full, a high-level signal is generated at the output of its filling sensor assembly, which is used to inform about the necessity to empty the coin acceptor.

The algorithm of the coin acceptor mechanism in case of the complex use without ACS (Fig. 19):

1. When the specified amount is received, the coin acceptor issues a passage enable command - a low level signal - to the Unlock A input of the turnstile control board. In this case the turnstile is unlocked in this direction and gives to the coin acceptor the command from the output Light A to block the acceptance of coins for the duration of the passage.

2. After the passage, the blocking signal is taken off and from the PASS A output a low-level signal to the pulse counter is sent.

3. When the coin acceptor is full, the filling sensor assembly issues a high-level signal to the Detector input of the turnstile control board, upon receipt of which the turnstile sends a low-level signal to the Alarm output (the command of the blocking of coin acceptance).

---

1 Modification with coin acceptor.
2 To accept coins (tokens), different from the standard Russian coins, it is necessary to reprogram the coin acceptor with the help of a special programming tool.
When the coin acceptor is emptied, the high-level signal from the Detector input is taken off, accepting of coins is resumed.

### 5.3 Control devices of the turnstile

The turnstile can be operated from the following control devices:
- the RC-panel;
- the WRC;
- the ACS-controller.

The above devices can be connected to the turnstile as follows:
- any device separately;
- in any combination with each other;
- all devices simultaneously (in parallel).

**Note:**

At the parallel connection of the above devices to the turnstile the superposition of the control signals from them may occur. In that case the turnstile response will conform to response to the obtained combination of input signals. (App. 2 and 3).

#### 5.3.1 Connection of the RC-panel

The RC-panel is connected to the contacts **GND, Unlock A, Stop, Unlock B, Led A, Led Stop** and **Led B** of the **XTU2**. The RC-panel is connected to the contacts **GND, Unlock A, Stop, Unlock B, Led A, Led Stop** and **Led B** of the Fig 17, 18, 19).

Standard orientation of RC-panel in regard to the housing is shown in Fig 11.

![Figure 11. Standard RC-panel orientation regarding turnstile](image)

**Table 3.** RC-cable connection to the **XTU2** connector block contacts for standard and reverse RC-panel orientation

<table>
<thead>
<tr>
<th>№</th>
<th>Contact</th>
<th>Standard</th>
<th>Reverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>GND</td>
<td>black</td>
<td>black</td>
</tr>
<tr>
<td>6</td>
<td>Unlock A</td>
<td>white</td>
<td>green</td>
</tr>
<tr>
<td>7</td>
<td>Stop</td>
<td>blue</td>
<td>blue</td>
</tr>
<tr>
<td>8</td>
<td>Unlock B</td>
<td>green</td>
<td>white</td>
</tr>
<tr>
<td>9</td>
<td>Led A</td>
<td>yellow</td>
<td>red</td>
</tr>
<tr>
<td>10</td>
<td>Led Stop</td>
<td>orange</td>
<td>orange</td>
</tr>
<tr>
<td>11</td>
<td>Led B</td>
<td>red</td>
<td>yellow</td>
</tr>
</tbody>
</table>
If working space of the operator is located on the opposite side of the housing, then for convenience of operation it is necessary to swap RC-panel cables, connected to contacts Unlock A and Unlock B, as well as Led A and Led B correspondingly (see Table 3).

**Note:**
The WRC is connected to the contacts GND, Unlock A, Stop and Unlock B of the XTU2 connector block. Power supply of the WRC is connected to the contact +12V of the XTU2 connector block.

### 5.3.2 Emergency opening device Fire Alarm

The emergency opening device is connected to the contacts “Fire Alarm” and “GND” of the XTU2 connector block in accordance with the connection layout (see Fig. 16). If the “Fire Alarm” input is not used, it is necessary to set a jumper between the contacts “Fire Alarm” and “GND”. This jumper is preset at the factory.

During release of control signal on Fire Alarm input, turnstile switches to the emergency Fire Alarm passageway opening. In this mode all incoming turnstile control signals are disregarded. Turnstile rotation mechanism is blocked for rotation in both directions. Central barrier arm falls down automatically by gravity and takes a vertical position which opens the passageway. The following indication in both directions is displayed simultaneously on main cover indication block: alternate switching on of green (for 1.25 sec) and red (for 0.25 sec) turnstile indicators.

If signal Fire Alarm comes on the turnstile during the passage, then on indication blocks appears an indication of Fire Alarm mode, but rotation mechanism blocking and passage emergency opening will take place only after resetting of barrier arm to its home position.

After release of control signal Fire Alarm on main cover indication block appears red indicator of passage denial and turnstile switches to the sleep mode with a dropped barrier. To proceed with the work, a barrier arm has to be manually set in horizontal position, where it fixes.

### 5.3.3 Control of the turnstile in ACS

Turnstile can be used as optional equipment while working as a part of ACS. In the turnstile it is possible to install built-in proximity card readers inside the side modules when using special side covers (see Table 1).

The ACS-controller outputs are connected to the contacts GND, Unlock A, Stop and Unlock B of the XTU2 connector block. The ACS-controller inputs are connected to the contacts Common, PASS A, PASS B of the XTU2 connector block and to the contacts Ready and Det Out of the XT1.H connector block. Pin assignments of the connector blocks are given in Fig. 17, 18).

### 5.4 Additional devices connectable to the turnstile

#### 5.4.1 Relay outputs

Connection of control board to relay outputs is done through corresponding contacts of connector block XT1.H. The following relay outputs are installed:
- **ALARM:** contacts Alarm 1 and Alarm 2 (see Clause 5.4.2),
- **PASS A:** contacts Pass A and Common (see Clause 5.2.8),
- **PASS B:** contacts Pass B and Common (see Clause 5.2.8),
- **READY:** contacts Ready and Common (see Clause 5.5),
- **DETECTOR:** contacts Det Out and Common (see Clause 5.4.2).

Contacts Pass A, Pass B and Common are also located on XTU2 connector block.
Relays have normally open contacts. Therewith common for those relays contact *Common* is not connected with the negative of turnstile power supply (galvanically isolated). In initial (standard) condition with a switched on power supply relay contacts *PASS A*, *PASS B*, *READY* and *DETECTOR* are closed (relay coil gets energized), and relay contacts *ALARM* are opened (relay coil gets deenergized).

Relay winding energizing can be identified by lighting up of corresponding red LED, installed on control board near the corresponding relay (see Fig. 7).

The output cascades for *PASS A*, *PASS B*, *Ready*, *Det Out* and *Alarm* are the contacts with the following signal characteristics (Fig. 12):
- maximum commutation voltage ...................................................... 42 VDC
- maximum switched current .......................................................... 0.25 A
- closed contact resistance ........................................................... no more than 0.15 Ohm

![Figure 12. Output cascades for PASS A, PASS B, Ready, Det Out and Alarm](image)

### 5.4.2 Intrusion detector and siren

**Warning!**

Installation of intrusion detector inside the turnstile housing is not anticipated.

Intrusion detector is connected to contacts *Detector*, *GND* and +12V of connector block *XT1.L* of control board. Characteristics of input signals are indicated in Clause 5.2.6. Current condition of intrusion detector is transmitted on relay output *DETECTOR* (contacts *Det Out* and *Common* of connector block *XT1.H*).

Siren is connected to contacts *Alarm 1*, *Alarm 2* and *GND* and +12V of connector block *XT1.H*. Characteristics of relay output signals *ALARM* are indicated in Clause 5.4.1.

Output activation *ALARM* takes place, if activation of input *Detector* takes place with a blocked rotating mechanism of the turnstile (command «Passage denial» or «Both directions closed» is issued), i.e. control signal comes from the intrusion detector. Output *ALARM* gets stabilized in 5 seconds after activation or in case of any incoming control command.

**Note:**

Control signal from intrusion detector doesn’t lead to *ALARM* output activation, if the rotating mechanism of the turnstile is blocked in one of directions or was blocked less than 3 seconds ago.
5.4.3 Remote indicators

Remote indication blocks for corresponding passage directions is connected to outputs Light A and Light B. Outputs are provided with the complete group of contacts: normally opened NO, normally closed NC and common C. Connection to the outputs is done correspondingly through connector blocks XT4 and XT5.

If the passage in direction A/B is permitted, relay of corresponding passage direction Light A/Light B gets activated (its winding gets energized), if the passage is denied – it gets stabilized. Relay winding energizing can be identified by lighting up of corresponding red LED, installed on control board near the corresponding relay.

Output cascades for the “Light A” and the “Light B” relays are nonbridging relay contacts (Fig. 13) with the following signal characteristics:
- maximum switched voltage .......................................................... 30 VDC
- maximum switched voltage .......................................................... 42 VAC
- maximum switched AC/DC .......................................................... 3 A
- closed contact resistance ......................................................... no more than 0.15 Ohm

Figure 13. Output cascades for Light A and Light B

5.5 Operation contingencies and response

Turnstile anticipates an alarm function of standard mode violation in case of unauthorized passage and in case of late barrier arms resetting to the home (closed) position. Barrier arms turn is controlled by activation of rotation unit light sensor. Sensor gets activated with barrier arms turn angle wider than 8 degrees from the home (closed) position.

- Unauthorized access is a rotation of barrier arms without a command to unblock the rotation unit.
- Barrier arms return to initial position is considered to be delayed if the passage zone is opened for more than 30 seconds.

In each of indicated cases the activation of switch READY takes place (switch coil is deenergized), therewith the output contacts Ready and Common get opened (ref. Clause 5.4.1). When barrier arms reset to home position, normalization of switch READY takes place (switch coil is energized), the output contacts “Ready” and “Common” get closed.

Note:

If the optical sensor of barrier arms rotation unit breaks down, the activation of switch READY takes place as well until the fault is repaired.
6 MARKING AND PACKAGING

The turnstile has a marking sticker on the internal side of the turnstile main cover and a label – inside, on the rear side of the main turnstile housing. The label contains trademark, contact information of the manufacturer, production date, power-supply voltage, power consumption. To get access to the marking sticker and the label, open the main cover.

The sticker is located on the inner surface of the main cover (2). The sticker contains a scheme of internal connections (main housing) of the turnstile, similar to that shown in Fig. 16.

To do so proceed as follows:

1. Switch off power supply of the turnstile.
2. Insert the key into the main cover lock (4) and open the lock.
3. Holding the front edge of the main cover (2) carefully lift it and turning it remove it from the turnstile housing. Be careful – do not damage the indication cable! When removing the cover, it must be disconnected from the main cover indication block (3).
4. Place the main cover on a flat steady surface.

Installation of the main cover back into its operation position is carried out in reverse order. After mounting the main cover close the lock. Turn on the turnstile power supply and move the upper barrier arm into the working position.

The turnstile in the standard delivery set is packed in two transport boxes and two packages (totally - 4 places), protecting the components of the product from damage during transportation and storage.

Box №1 overall dimensions (length × height × width) ........................................ 146×110×40 cm
Box №1 weight (gross) .................................................................................. not more than 100 kg
Box №2 overall dimensions (length × height × width) ........................................ 114×30×40 cm
Box №2 weight (gross) .................................................................................. not more than 35 kg
7 SAFETY REQUIREMENTS

7.1 Installation safety requirements

The installation should be carried out only by the qualified personnel after careful study of this Manual.

**Warning!**
- All the cables should be connected up when the power supply is switched off from the AC mains.
- Only serviceable tools should be used for installation.
- Observe general electrical safety rules when laying out the cables.
- Before the turnstile first power on make sure its installation and connection have been made accordingly.

Power supply unit installation must be made in accordance with the safety rules stipulated in its certificate.

7.2 Operation safety requirements

Observe general electrical safety rules when operating the turnstile.

**Warning!**
- 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 unit operation are shown in their certificates.
8 INSTALLATION INSTRUCTIONS

Follow the safety requirements during the installation (see Clause 7.1).

8.1 Installation details

Proper installation is critical to performance and serviceability of the turnstile. We strongly advise to study this section before installation work, and follow the instructions to the latter.

It is recommended:

- to mount the turnstile on steady and level concrete (grade 400 or higher, strength class B22.5), stone or similar foundations at least 150 mm thick;
- to level the foundation so that the anchoring points of the turnstile lie in the same plane (check it with a level);
- to apply reinforcing elements (400×400×200 mm) for installation on less steady foundation;
- to mark the mounting holes according to Fig. 21;
- to control vertical alignment of the turnstile with a level during installation;
- to do installation of the turnstile by at least 2 skilled installers;
- when arranging a passage area through the turnstile please take into account that the resetting mechanism operates as follows:
  - at the barrier arm turning at the angle of more than 67° the reset is effected in the direction of movement;
  - at the barrier arm turning at the angle less than 67° the reset is effected counter the movement direction (reset to home position).

Note:

The angle gradient, at which the barrier arm reset commences, may vary in the range of ± 5°. To ensure accurate passage tracking, when the turnstile is operated from an ACS, it is recommended to arrange the passage area in such a way that the barrier arms should turn in the direction of movement at the angle no less than 70° (Fig. 14).

![Figure 14. Installation recommendations](image-url)
By organization of the passage zone it is essential to anticipate an extra emergency exit. For example, “anti-panic” hinged section of *BH-02* railing (ref. Clause 9.4) can serve as such an exit.

![Diagram](image)

**Figure 15. Cable layout inside the housing**

1 – CLB; 2 – side module; 3 – side indication block; 4 – remote connector blocks *XTU*; 5 – power cable; 6 – cable from the RC-panel (WRC); 7, 8 – side module indication cables; 9 – ACS installation zone; 10 – indication cables connectors; 11 – screws fixing the side module
8.2 Installation tools

- 1.2÷1.5 kW hammer drill;
- Ø16 mm hard-alloyed drill bits;
- Floor chaser for electric raceway;
- Flat slot screwdriver №2;
- Flat slot screwdriver №5 (150 mm);
- Cross-head screwdriver №2;
- Horn-type and socket wrenches: S17, S13, S10, S8, S7, S5,5;
- Level;
- Measuring tape (2 m);
- Slide caliper.

Note:
It is allowed to use other testing equipment and measuring tools provided the equipment in use ensures the required parameters and measurement accuracy.

8.3 Length of cables

Cables, used for installation, are listed in table 4.

Table 4. Cables used during the installation

<table>
<thead>
<tr>
<th>№</th>
<th>Equipment connected to the turnstile controller</th>
<th>Maximum cable length, m</th>
<th>Cable type</th>
<th>Minimum cross-section, mm</th>
<th>Example of the cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power supply</td>
<td>10</td>
<td>Twin wire</td>
<td>1.5</td>
<td>AWG 18; HO3VV-F 2×1.5 bi-colored</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>Twin wire</td>
<td>2.5</td>
<td>AWG 13; HO5VV-F 2×2.5 bi-colored</td>
</tr>
<tr>
<td>2</td>
<td>Fire Alarm</td>
<td>30</td>
<td>Twin wire</td>
<td>0.2</td>
<td>RAMCRO SS22AF-T 2×0.22 CQR-2</td>
</tr>
<tr>
<td></td>
<td>Additional equipment, connected to inputs or outputs of CLB</td>
<td>40</td>
<td>8 triad cable</td>
<td>0.2</td>
<td>CQR CABS8 8×0.22c</td>
</tr>
<tr>
<td>3</td>
<td>RC-panel</td>
<td>40</td>
<td>6 triad cable</td>
<td>0.2</td>
<td>CQR CABS6 6×0.22c</td>
</tr>
</tbody>
</table>
8.4 Connection layouts of the turnstile and optional equipment

Figure 16. Scheme of internal connections (main housing)
Figure 17. Connection layout of the turnstile (standard version) and additional equipment

1 Elements of the scheme are listed in Table 5. Elements, marked with a star sign (*) are not included in standard delivery set.
Figure 18. Connection layout of the turnstile (version with a card capture reader) and additional equipment

Elements of the scheme are listed in Table 5. Elements, marked with a star sign (*) are not included in standard delivery set.
Figure 19. Connection layout of the turnstile (version with a coin acceptor) and additional equipment

1 Variant without connection to the ACS controller (connection to ACS is similar to Fig.17). Connecting remote indicators, ID and siren in this version is not possible. Elements of the scheme are listed in Table 5. Elements, marked with a star sign (*) are not included in standard delivery set.
Table 5. Elements of the connection layouts

<table>
<thead>
<tr>
<th>Legend</th>
<th>Name</th>
<th>Q-ty</th>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Main housing</td>
<td>1</td>
<td>17, 18, 19, 20</td>
</tr>
<tr>
<td>A2</td>
<td>Main cover</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>A2.1</td>
<td>Main cover indication block</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>A3</td>
<td>Bracket with CLB and remote connector blocks</td>
<td>1</td>
<td>17, 18, 19, 20</td>
</tr>
<tr>
<td>A4</td>
<td>Control logic board <strong>CLB.140</strong></td>
<td>1</td>
<td>17, 18, 19, 20</td>
</tr>
<tr>
<td>A5</td>
<td>Control mechanism</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>A5.1</td>
<td>Rotation sensor unit</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>A5.2</td>
<td>Electromotors</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>A5.3</td>
<td>Electromagnet</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>A6</td>
<td>Side module TTD10A.250.00 (standard right)</td>
<td>1</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>A7</td>
<td>Side module TTD10A.250.00-01 (standard left)</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>A8</td>
<td>Side module TTD10A.370.00 (with card capture reader)</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>A9</td>
<td>Side module TTD10A.380.00 (with coin acceptor)</td>
<td>1</td>
<td>20, 21</td>
</tr>
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<td>A10.1</td>
<td>Side indication block, left version</td>
<td>1</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>A10.2</td>
<td>Side indication block, right version</td>
<td>1</td>
<td>18, 19, 20</td>
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<td>Name</td>
<td>Q-ty</td>
<td>Figure</td>
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<td>Card capture reader</td>
<td>1</td>
<td>19</td>
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<tr>
<td>A12</td>
<td>Coin acceptor ICT UCA2</td>
<td>1</td>
<td>21</td>
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<tr>
<td>A13</td>
<td>Sensor of container filling</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>A14</td>
<td>Counter of passes Yenox H2-7EA2</td>
<td>1</td>
<td>21</td>
</tr>
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<td>A15</td>
<td>RC-panel</td>
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<td>18, 19, 20</td>
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<td>Emergency opening device \textit{(Fire Alarm)}</td>
<td>1</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>A17\textsuperscript{1}</td>
<td>Turnstile power supply DC 12V</td>
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<td>18, 19, 20</td>
</tr>
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<td>A18\textsuperscript{1}</td>
<td>Siren DC12V</td>
<td>1</td>
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</tr>
<tr>
<td>A19\textsuperscript{1}</td>
<td>Intrusion detector</td>
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<td>18, 19</td>
</tr>
<tr>
<td>A20\textsuperscript{1}</td>
<td>ACS-controller</td>
<td>1</td>
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</tr>
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<td>A21\textsuperscript{1}</td>
<td>WRC device</td>
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<td>Remote indicators</td>
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<td>A23\textsuperscript{1}</td>
<td>Remote indicator power supply</td>
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<td>Remote connector block \textit{Klemsan} 1/4</td>
<td>1</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>XTU2</td>
<td>Remote connector block \textit{Klemsan} 1/12</td>
<td>1</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>XTU3</td>
<td>Remote connector block \textit{Klemsan} 1/12</td>
<td>1</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>XTU4</td>
<td>Remote connector block \textit{Klemsan} 1/12</td>
<td>1</td>
<td>20, 21</td>
</tr>
<tr>
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<td>Internal turnstile power cable</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>Internal turnstile control cable</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>Internal cable to indication connector</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>Main cover indication cable</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>5.1, 5.2</td>
<td>Indication cables from the main housing to the side modules</td>
<td>2</td>
<td>17, 18, 19, 20</td>
</tr>
<tr>
<td>6.1, 6.2</td>
<td>Indication cables from the side modules</td>
<td>2</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>7</td>
<td>Wire jumper. Installed when the emergency opening device (A16) is not connected, installed on default.</td>
<td>1</td>
<td>17, 18, 19, 20</td>
</tr>
<tr>
<td>8</td>
<td>Wire jumper. Installed when the intrusion detector (A19) is not connected, installed on default.</td>
<td>1</td>
<td>17, 18, 19</td>
</tr>
<tr>
<td>9</td>
<td>Wire-splitter of terminal block \textit{XTU3}</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>10</td>
<td>Wire-splitter of terminal block \textit{XTU4}</td>
<td>1</td>
<td>21</td>
</tr>
</tbody>
</table>

\textsuperscript{1} Not included in standard delivery set.
8.5 Installation procedure

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

Content of installation procedures is presented per feedback in Clause 8.1. Equipment’s and tools, required for installation, are listed in Clause 8.2. Cable types, used during installation, are listed in Clause 8.3. Connection layouts of the turnstile and optional equipment are presented in Clause 8.4. Item numbers are listed in accordance to Fig. 2.

During turnstile installation keep to the following procedure:

1. Install the turnstile power supply unit in its place (See power supply unit certificate for installation procedure of the power supply unit).
2. Drill the holes for anchor bolt sleeves to fix the turnstile housing (Ref. Fig. 21).

3. If you lay the cables under the floor surface, prepare the electric raceway to the cables laying zone of the turnstile housing. The cables layout inside the turnstile housing is shown in Fig. 15.

Caution!

- It is necessary to leave a reserve of length, enough for hinged joint removal and for the access to the barrier arms rotation unit, of those cables that are connected to the remote connector block and control board.
- Fix the housing after laying the cables in the electric raceway and inside the turnstile housing. Be careful and prevent the turnstile from falling before it is fixed.

4. Insert the sleeves for the anchor bolts into the holes so that they do not stick out above the floor surface.
5. Unpack main housing of the turnstile (box №1). Remove the turnstile housing main cover (2), ref. Section 6.
6. Set up the housing on anchor bolt sleeves and fix it with the M10 bolts through the holes in the housing base.
7. Connect the power cable (9) to a connector block XTU1 according to connection layout.
8. If necessary, install the board of the external ACS controller inside the turnstile housing on the bracket (9, Fig. 15) and connect it to the CLB board (ref. Clause 8.4).
9. Connect the cable of the RC-panel (10) or WRC to a connector block XTU2 (ref. Clause 8.4) or to external ACS-controller (ref. controller Operation Manual).

10. If needed, connect cables from other devices to corresponding connector blocks of control board (ref. Clause 8.4).

11. Use jumper J1 to select the desired turnstile control mode (pulse or potential, ref. Clause 5.2.7).

12. Unpack the side modules (6, 13 or 17) (box No.2) and the side covers (8) (packages No.3 and No.4).

13. Fix the side covers on the side modules. If necessary, install the necessary equipment in the side modules under the side covers or on them. Features of the installation of side covers are described in Appendix 1.

Attention!

Possibility of PERCo card reader’s installation is anticipated in the turnstile housing inside side modules on special brackets. With installation of third manufacturers readers they should correspond with following technical characteristics:

- overall readers dimensions ........................................ not more than 175×120×50 mm
- sensors read range............................................................... not less than 50 mm

When installing another additional equipment, the side covers are purchased separately for specific equipment (see Clause 4.2 and Appendix 1).

14. Decide which of the side modules (standard (6), with card capture reader (13) or coin acceptor (17)) will be left, and which is right for the turnstile housing. Note that the arrows on the side indication blocks (7) are pointed towards the passage through the turnstile. If necessary, switch the indication blocks.

To remove the side indication block (7):

- **for standard side module (Fig. 22):**
  - remove the plate (4, Fig. 22), in order to do that turn off 6 screws (7, Fig. 22),
  - remove the bracket (3, Fig. 22) by unscrewing 4 nuts with washers (6, Fig. 22),
  - disconnect the connector of the indication cable from the indication block board,
  - remove the indication block (2, Fig.22) by unscrewing 4 nuts with washers (5, Fig.22).

- **for side module with card capture reader (coin acceptor) (Fig. 23):**
  - open the collector cover lock with the key (3, Fig. 23) and pull it with the key towards you until it stops,
  - disconnect the connector of the indication cable from the indication block board,
  - remove the indication block (2, Fig.23) by unscrewing 4 nuts with washers (4, Fig.23).

Installation of indication blocks is carried out in the reverse order. Before installation, place the jumper CROSS / ARROW as needed on both indication blocks (see Clause 5.2.3).
Figure 22. Side indication block (standard side module)

1 – standard side module; 2 – side indication block; 3 – bracket; 4 – plate; 5 – nuts with washers for fixing the indication block; 6 – nuts with washers for fixing the bracket, 7 – screws for fixing the plate

Figure 23. Side indication block (side module with built-in card capture reader)

1 – side module with built-in card capture reader, 2 – container cover; 3 – side indication block; 4 – nuts with washers for fixing the indication block
15. Reinstall the side modules, each in the following order:
   - tilting the top of the side module toward you, insert its bottom into the appropriate place in the turnstile housing;
   - holding the side module, carefully lay the indicating cable from the side module to the control board bracket in the main housing in order not to damage it when installing the side module;
   - put the top of the side module back, herewith the holes in its upper mounting plate must be aligned with the corresponding threaded bushings in the turnstile housing;
   - fix the side module using two screws with washers (11 in Fig. 15);
   - connect the indication cable connector from the side module to the corresponding (right "R" or left "L") indication cable connector of the main housing (10 in Fig. 15).

16. Check serviceability and accuracy of all the electrical connections. Fix all cables with the help of self-adhesive foundations and fixed brace rods from the delivery set.

17. Put back a main cover (2) in an order, opposite to removal, see Section 6.

18. Check the work of the turnstile with RC-panel, according to Section 9 depending on a switched control mode.

The turnstile is ready for operation.
9 OPERATION INSTRUCTIONS

When operation the equipment, observe precautions (Clause 7.2).

**Warning!**

- Do not move through the turnstile passage area any objects with dimensions exceeding the width of the passageway.
- Do not jerk and hit any elements of the turnstile so as to prevent their mechanical deformation.
- Do not dismantle or adjust mechanisms ensuring operation of the turnstile.
- Do not use substances for cleaning of the turnstile that may cause mechanical damage or corrosion of the surfaces.

9.1 Power-up

Follow these steps:

1. Connect the turnstile power supply unit to the AC outlet with the voltage and frequency rating according to the certificate for the power supply unit.
2. Turn on the power supply. Red indicators (ban on passage) will light up on the main cover indication block, on the RC-panel the red indicator above “Always locked” will light up.
3. Manually lift up the folding arm. The arm will be fixed in this position.
4. Check operation of the intrusion detector and siren (if included in the delivery set and installed accordingly), as well as the operation of other installed additional equipment in accordance with their operational documentation.

The turnstile is ready for operation.

9.2 Pulse control mode

See Table 6 for the operating modes set from the RC-panel and for the corresponding indication. 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.

The RC-panel overall view is given in Fig. 6. Herewith:

- 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 made within 5 sec.
- In the “Bi-directional single passage” mode after the passage in one direction the countdown of the passage waiting time (5 sec.) for the opposite direction is recommenced.
- 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.
<table>
<thead>
<tr>
<th>The turnstile operating modes</th>
<th>Actions to do</th>
<th>Indication</th>
<th>Turnstile status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Always locked</strong> <em>(Locked for entry and exit)</em></td>
<td>Press the <strong>STOP</strong> button on the RC-panel</td>
<td>The red indicator above the <strong>STOP</strong> button is on</td>
<td>The “Red crosses” for each passage direction are on</td>
</tr>
<tr>
<td><strong>Single passage in the set direction</strong> <em>(open for passage of one person in the chosen direction)</em></td>
<td>Press the <strong>LEFT/RIGHT</strong> button on the RC-panel</td>
<td>The green indicator above the button of the chosen passage direction <strong>Left/Right</strong> is on</td>
<td>The “Green arrow” in the chosen passage direction is on</td>
</tr>
<tr>
<td><strong>Bi-directional single passage</strong> <em>(open in both directions for ‘one-by-one’ passage)</em></td>
<td>Press both the <strong>LEFT</strong> and <strong>RIGHT</strong> buttons on the RC-panel simultaneously</td>
<td>The two green indicators (<strong>Left</strong> and <strong>Right</strong>) are on</td>
<td>The “Green arrow” for each passage direction is on. After the passage in the chosen direction the “Red cross” is on for that direction.</td>
</tr>
<tr>
<td><strong>Free passage in the set direction</strong> <em>(open for free passage in the chosen direction)</em></td>
<td>Press the <strong>STOP</strong> button and the button corresponding to the chosen passage direction <strong>LEFT/RIGHT</strong> simultaneously</td>
<td>The green indicator above the button of the chosen passage direction <strong>Left/Right</strong> is on</td>
<td>The “Green arrow” in the chosen passage direction is on.</td>
</tr>
<tr>
<td><strong>Free passage in the set direction and single passage in the opposite direction</strong> <em>(open for free passage in the chosen direction and for passage of one person in the opposite direction)</em></td>
<td>Set the “<strong>Free passage in the set direction”</strong> mode for one direction and “<strong>Single passage in the set direction”</strong> for the other.</td>
<td>The two green indicators (<strong>Left</strong> and <strong>Right</strong>) are on. After the single passage the “Red cross” is on.</td>
<td>The “Green arrows” for each passage direction 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 gets locked in the single passage direction</td>
</tr>
<tr>
<td><strong>Always free</strong> <em>(open for entry and exit)</em></td>
<td>Press all the 3 buttons on the RC-panel simultaneously: <strong>LEFT, STOP</strong> and <strong>RIGHT</strong></td>
<td>The two green indicators (<strong>Left</strong> and <strong>Right</strong>) are on.</td>
<td>The “Green arrows” for each passage direction are on.</td>
</tr>
<tr>
<td><strong>“Antipanic”</strong></td>
<td>All RC commands are ignored</td>
<td>Both <strong>Left</strong> and <strong>Right</strong> green indicators flash</td>
<td>The arrows of both directions flash</td>
</tr>
</tbody>
</table>
9.3 Potential control mode

See Table 7 for the operating modes set from the RC-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.

If by the moment of passage through the turnstile the low level is present on the contact, corresponding to the set passage direction, the turnstile remains open in the set direction.

For the ACS outputs note the following:

- High level — contacts of the output relay are broken or the output transistor is closed.
- Low level — contacts of the output relay are closed or the output transistor is open.

Table 7. Potential control mode (the jumper is taken off from the J1 connector)

<table>
<thead>
<tr>
<th>The turnstile operating modes</th>
<th>Actions to do</th>
<th>Indication</th>
<th>Turnstile status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both passage directions are locked (the turnstile is locked both for entry and exit)</td>
<td>The high level — on contacts “Unlock A” and “Unlock B” or low level — on the contact “Stop”</td>
<td>The red indicator above the STOP button is on</td>
<td>The turnstile is locked</td>
</tr>
<tr>
<td>One of the passage directions is open (the turnstile is open for passage in the set direction)</td>
<td>The low level — on the contact corresponding to the passage direction, the high levels — on the other contacts</td>
<td>The green indicator above the button of the chosen passage direction “Left” / “Right” is on</td>
<td>When the passage is completed, the turnstile is locked</td>
</tr>
<tr>
<td>Both passage directions are open (the turnstile is open both for entry and exit)</td>
<td>The low level — on contacts “Unlock A” and “Unlock B”, The high level — on the contact “Stop”</td>
<td>The two green indicators (“Left” and “Right”) are on</td>
<td>The turnstile remains open</td>
</tr>
<tr>
<td>«Antipanic»</td>
<td>All RC commands are ignored</td>
<td>Both «Left» and «Right» green indicators flash</td>
<td>The barrier bar is lowered to the vertical position, the passage through the turnstile is unimpeded</td>
</tr>
</tbody>
</table>
9.4 The algorithm of the card capture reader operation

The built-in card capture reader operation is possible only in the ACS. The ACS controller is configured to operate the built-in card capture reader in accordance with its operational documentation.

To present the access card to the reader, it's necessary to insert it into the card slot. For convenience of users in the standby mode, the receiving slot of the card capture reader is permanently illuminated by the built-in LED indicator.

If the presented card is a permanent employee card and does not require the withdrawal, the ACS controller allows the passage through the turnstile in the given direction (gives the appropriate signal to the turnstile control mechanism). The shutter, blocking access to the card collector, remains closed, preventing the accidental withdrawal of the card. The illumination of the card slot remains constant.

If the presented card is a temporary visitor card and requires the withdrawal, the illumination of the card slot will start flashing with a frequency of 2 times per second. The shutter, blocking access to the card collector, will open and the card will fall into the card collector.

After the card withdrawal to the container, the shutter of the card capture reader automatically closes, the illumination of the card slot becomes permanent again, the ACS controller allows a single passage through the turnstile in the indicated direction.

If for some reason the card is not withdrawn during the Confirmation Timeout (set in the ACS) (for example, the visitor will not insert the card or it will get stuck in the slot), the ACS controller will prohibit passage in this direction and the illumination of the receiving slot will become permanent. After that, the access card will have to be taken out of the card slot and presented for rereading and withdrawal.

When the card collector is full, the "Alarm" signal is sent to the ACS controller, the illumination of the card capture reader card slot goes into the flashing mode with a frequency of 1 time in 2 seconds, thereby warning about the need to free the collector from the withdrawn cards. If the collector is not emptied, then after receiving 10 more cards, the work of the card capture reader is blocked, the illumination of the card slot is extinguished.

The "Alarm" signal release and card capture reader unblocking occur automatically after the collector is emptied from the cards (the procedure for the removal and installation of the collector is given in Clause 9.6).

The "Alarm" signal is also sent to the ACS controller in case of card capture reader malfunction, the illumination of the receiving slot goes out until the fault is eliminated. If the card collector, installed in the turnstile, is empty but the blocking and the "Alarm" signal are not removed, the probable cause of this may be the malfunctions of the units providing the card capture reader operating. In this case, we advise to consult the nearest PERCo service center. The list of service centers is given in the Certificate of the turnstile.

9.5 The algorithm of the coin acceptor operation

Attention!

The coin acceptor is a complex technical device, the use of the coin acceptor is allowed only in accordance with its operating documentation.

---

1 Modification with side module with card capture reader.
2 Modification with coin acceptor.
The coin acceptor can be used both in the ACS, and without it and additional devices. Features of the operation in the ACS are determined by the capabilities and settings of the system itself.

**The standard algorithm of the coin acceptor operation**

For the authorized passage through the turnstile, you need to insert the required number of coins (tokens) one by one into the slot of the coin box. The number of coins (tokens) is determined by the settings of the coin acceptor (see Clause 5.2.10). When the specified amount is received, the coin acceptor gives the permission of the passage to the turnstile control mechanism, the turnstile is unlocked in this direction, the coin acceptor blocks reception of coins (tokens) until the end of the passage.

**Note:**

Upon delivery, the coin acceptor is programmed to accept standard Russian coins. To accept coins (tokens), different from the standard Russian coins, it is necessary to reprogram the coin acceptor with a special programming tool and software (supplied by the coin acceptor manufacturer).

After the passage, the blocking of the coins (tokens) acceptance is removed.

When the coin acceptor is full, the acceptance of coins (tokens) is blocked. The high-level signal is generated at the output of the filling sensor assembly, which is used to inform about the necessity to empty the coin acceptor. When the coin acceptor is emptied (see Clause 9.6), the acceptance of coins is resumed.

The pulse counter (located inside the side module) along channel A counts the number of authorized passages. The counter has a reset button.

In case of malfunctions of the built-in coin acceptor, we advise to consult the nearest PERCo service center. The list of service centers is given in the Certificate of the turnstile.

**9.6 Removing and installation of the card collector or coin acceptor**

To remove the card collector (container of the coin acceptor) from the turnstile, do the following:

1. Turn the key of the cover lock of the card reader (coin acceptor) until it stops (open the lock).
2. Pull the key of the lock, thereby opening the cover and providing access to the card collector/container.
3. Remove the card collector/container from the turnstile.

The installation of the card collector/container into the turnstile is carried out in the reverse order.

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¹ Modifications with side modules with card capture reader or with coin acceptor.
10 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. Such emergency exit can be the automatic anti-panic rotary section **BH-02**.

The additional emergency exit can be provided by the turnstile passage area. Construction of the turnstile enables immediate clear of passage way without use of any special keys or tools. By putting the *Fire Alarm* signal to turnstile logic board the barrier arm automatically falls down allowing the free exit.

The arm also drops down automatically at a power supply loss.

11 TROUBLESHOOTING

Possible faults, which can be cleared by the users themselves, are listed in Table 8.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>At the power-up the turnstile doesn’t work, and there is no light indication on the turnstile housing and the RC-panel</td>
<td>No supply voltage to the CLB</td>
<td>Switch off the turnstile power supply from the AC mains, open the turnstile housing cover. Check the power cable serviceability and reliability of its connection</td>
</tr>
<tr>
<td>The turnstile is not controlled in one of the directions, and there is light indication on the turnstile housing and on the RC-panel</td>
<td>The CLB does not receive a control signal for this direction</td>
<td>Switch off the turnstile power supply from the AC mains, open the turnstile housing cover, and remove the outer panel. Check the RC-panel / WRC kit / ACS-controller cable serviceability and reliability of its connection</td>
</tr>
</tbody>
</table>

In case of other faults and defects, please apply to the PERCo Technical Support Department (the PERCo TSD).
12 MAINTENANCE

The turnstile maintenance is required once a year and in case of any technical failures the turnstile must be serviced immediately after repair works. The maintenance should be carried out by qualified mechanic only after careful study of this Manual.

To do maintenance proceed as follows:

1. Disconnect the turnstile power supply from the AC mains, the folding arms will automatically fall down.

2. Remove the hub with the barrier arms by unscrewing the three screws M8.

3. Molybdenum grease lubricate in the hub elements.

4. Remove the turnstile main cover (2) from the turnstile housing as described in Section 6. Lay the cover on a flat steady surface.

5. To access the rotation unit of turnstile barrier arms, take off the bracket with control board and remote connector block. For this purpose: unscrew 6 screws, which fix the bracket on the turnstile housing and accurately take a bracket aside without damaging connected cables.

6. Inspect the resetting mechanism (a pusher, springs and a roller), optic sensors and a damper (Ref. Fig. 24).

**Attention!**

Avoid ingress of lubricant on the rotation sensor disc and the roller surfaces.

7. Remove dust from a rotation sensor disc, located in the spacing of the rotation optic sensors, with alcohol-gasoline blend applied with a cloth. Avoid ingress of dust into the operational spacing of the optic sensors.

8. Lubricate with machine oil (lubrication points are marked in Fig. 24):
   - four bushes of the resetting mechanism (two – on the rotation axis of the pusher;
   - two – on the fastening axis of the springs as well as holes in the fastening parts of the springs); 2-3 drops of oil in each lubrication point.

9. Fix the bracket with control board and remote connector block in an order, opposite to removal.

10. Establish a hub with barrier arms into place in the reverse order.

11. Check reliability of the cable connections to the CLB connector blocks and if necessary tighten the cable fixing screws.

12. Check reliability of the barrier arm (5) fastening.

13. Remove side modules (6, 13, 17) in accordance with Clause 8.5 of this Manual. Check reliability of the turnstile housing fastening to the floor and if necessary, tighten the anchor bolts.


15. Return the main cover (2) into its operating position.

16. Energize the turnstile and lift up the folding arm.

17. Check operation of the turnstile in accordance with Section 9 of this Manual.

After maintenance works are complete the turnstile is ready for further operation.
In case of any defects revealed during visual check please apply to the PERCo Technical Support Department (the PERCo TSD).

Figure 24. Interior components of the turnstile mechanism

13 TRANSPORTATION AND STORAGE

The turnstile in the original package should be transported in closed freight containers or other closed type cargo transport units.

Do not stack the boxes with the turnstiles during transportation and storage.

Storage of the turnstile is allowed in dry indoor facilities at an ambient air temperature from –40°C to +55°C at relative air humidity 98% at +25°C.

After transportation or storage at temperatures below zero or at high air humidity, prior to installation the turnstile must be kept in the original package for no less than 24 hours indoors under conditions corresponding to operation conditions (Ref. Section 2).
APPENDIXES

Appendix 1. Design of different types of turnstile side covers

The side covers of the turnstile are a variable functional element of the product and are designed for different application, which is determined by their type. The type of each cover is selected by the customer when ordering the turnstile. Types of manufactured side covers and their application are shown in Table 1.

Side cover is installed on the side module from the top, four threaded posts must correspond with the holes in the module post. The cover is fixed with 4 nuts with washers (S5 key).

1. Side cover C-10B – is a cover without additional functions, made of stainless steel.

![Figure 25. Dimensions of the side cover C-10B](image)

2. Side cover C-10R is designed for installation of the built-in RFID reader into the turnstile, it is made of stainless steel, it has a window made of radio-transparent material.

![Figure 26 Side cover C-10R](image)
3. Side cover **C-10A** is designed for installation of the built-in RFID reader and the alcohol detector into the turnstile.

It is made of stainless steel, it has a window made of radio-transparent material and a bracket for the alcohol detector.

![Figure 27. Side cover C-10A](image)

4. Side cover **C-10Q** is designed for installation of the built-in barcode reader into the turnstile.

It is made of stainless steel, has a window from transparent tinted glass.

![Figure 28. Side cover C-10Q](image)

5. Side cover **C-10F** is designed for installation of the biometric fingerprint reader into the turnstile.

It is made of stainless steel, has a bracket-plate for installation of the reader. The plate is turned 20° from the rolling axis of the turnstile towards the passage to facilitate the reading, it is possible to turn the site to the other side, depending on the side of the turnstile where the side cover will be installed. To do this, remove the bracket-plate from the cover by unscrewing two nuts and reset it to a different position.
Figure 29. Side cover C-10F

6. Side cover **C-10C** is designed only for installation into the turnstile in the **TTD-10AC** version with built-in card capture reader.

It is made of stainless steel, has a slot for cards.

Figure 30. Side cover C-10C
Appendix 2. Control signal algorithm at pulse control mode

**Note:**
For the RC-panel:
- **active front** — pressing of the relevant button on the RC-panel;
- **low level** — the relevant button on the RC-panel has been pressed;
- **high level** — the relevant button on the RC-panel has not been pressed.

The command is a signal active front (signal transfer from the high level to the low level) at any of the contacts at presence of the corresponding signal levels at the other contacts.

The following commands can be formed by sending a low-level signal to the contacts “Unlock A”, “Stop” and “Unlock B” of the XT1.L (or XS1) connector block relatively to the contact “GND”:

**Always locked (locked for entry and exit)**
Active front is at the contact “Stop” while there is a high level at the contacts “Unlock A” and “Unlock B”. Both passage directions are locked at this command.

**Single passage in the direction A (open for passage of one person in the direction A)**
Active front is at the contact “Unlock A” while there is a high level at the contacts “Stop” and “Unlock B”.

At this command the passage direction A opens either for 5 sec. or until the passage has been made in this direction or until the command «Always locked», and the status of the passage direction B does not change at that. The command is ignored if at the moment of its receipt the status of the passage direction A is «Always free».

**Single passage in the direction B (open for passage of one person in the direction B)**
Active front is at the contact “Unlock B” while there is a high level at the contacts “Stop” and “Unlock A”.

At this command the passage direction B opens either for 5 sec. or until the passage has been effected in this direction or until the command «Always locked», and the status of the passage direction A does not change. The command is ignored if at the moment of its receipt the status of passage direction B is «Always free».

**Bi-directional single passage (open in both directions for ‘one-by-one’ passage)**
Active front is at the contact “Unlock A” while there is a low level at the contact “Unlock B” and a high level at the contact “Stop”,

or active front is at the contact “Unlock B” while there is a low level at the contact “Unlock A” and a high level at the contact “Stop”.

At this command the both passage directions open either for 5 sec. each or until the passage has been effected in the given direction or until the command «Always locked» is received. The command is ignored for the passage direction, which status at the moment of its receipt is «Always free».

**Free passage in the direction A (open for free passage in the direction A)**
Active front is at the contact “Unlock A” while there is a low level at the contact “Stop” and a high level at the contact “Unlock B”,

or active front is at the contact “Stop” while there is a low level at the contact “Unlock A” and a high level at the contact “Unlock B”.

At this command the passage direction A opens until the command «Always locked» is received; the status of the passage direction B does not change at that.
Free passage in the direction B (open for free passage in the direction B)
Active front is at the contact “Unlock B” while there is a low level at the contact “Stop” and a high level at the contact “Unlock A”,
or active front is at the contact “Stop” while there is a low level at the contact “Unlock B” and a high level at contact “Unlock A”.

At this command the passage direction B opens until the command «Always locked» is received; the status of the passage direction A does not change at that.

Free passage (open for free passage in both directions)
Active front is at the contact “Unlock A” while there is a low level at the contacts “Unlock B” and “Stop”,
or active front is at the contact “Unlock B” while there is a low level at the contacts “Unlock A” and “Stop”,
or active front is at the contact “Stop” while there is a low level at the contacts “Unlock A” and “Unlock B”.

The both directions open at this command until the command «Always locked» is received.

Appendix 3. Control signal algorithm at potential control mode

Note:
For an ACS-controller outputs:
- low level – either contacts of the output relay are closed or the output transistor is open.
- high level – either contacts of the output relay are broken or the output transistor is closed.

Both directions are locked (locked for entry and exit)
There is a high level at the contacts “Unlock A” and “Unlock B”,
or a low level at the contact “Stop”.

Both passage directions close at this command.

The direction A is open (open for passage in the direction A)
There is a low level at the contact “Unlock A” while a high level is present at the contacts “Stop” and “Unlock B”.

At this command the direction A opens up to the low-level signal removal from the contact A or until the command «Both directions locked» is received. The status of the direction B does not change at that.

The direction B is open (open for passage in the direction B)
There is a low level at the contact “Unlock B” while there is a high level at the contacts “Stop” and “Unlock A”.

At this command the direction B opens up to the low-level signal removal from the contact B or until the command «Both directions locked» is received. The status of the direction A does not change at that.

Both directions are open (open for entry and exit)
There is a low level at the contacts “Unlock A” and “Unlock B” while there is a high level at the contact “Stop”.

Both directions open at this command up to the low-level signal removal from one of the contacts A (B) or until the command «Both directions closed» is received.
Appendix 4. Instructions for setting up the coin acceptor ICT UCA2


1. Connect the coin acceptor to the PC COM port using the WEL-R7U06 cable (available separately), the connector is located on the side panel of the coin acceptor (see Fig. 31).

![Figure 31. Connectors layout](image)

2. Power the coin acceptor (contacts 1 and 2 of the **XTU4** terminal strip, see Fig. 20). The indicator lights up (shown in Fig. 31).

3. Install and run the application to configure the card capture reader settings “UCAx Tools” on the PC. The application window is shown in Fig. 32, connection with the coin acceptor is automatically installed immediately after the application is launched.

![Figure 32. The program window with settings](image)

(an example of the configuration for receiving the amount of 10 rubles)
4. The coin acceptor settings are made on the **Parameter Setting** tab:
   - click the **Read current version from UCA1** button, the current software version, for example, UCA2S3801I0010 (5198) will be displayed in the **Status** line (see Fig. 32);
   - To read the current settings of the coin acceptor, click the **Read setting from UCA1** button;
   - in the coin acceptor parameters fields, set the following values:
     - in the **Inhibit Level** line - Low Inhibit (low-level blocking signal);
     - in the **Output Mode** line - Pulse output mode (pulse mode);
     - in the **Interval of Pulse** line - 100 ms (pulse duration 100 ms);
     - in the table in the columns **Value of Coin, Disable, Sorter, Dipsw**, set the coin denominations and the corresponding parameters for coin acceptor channels (from the 1st to the 8th), as shown in Fig. 32.

5. In the **Value of Pulse** field, enter the amount to be paid by the user for the passage (Fig.32 shows an example of the amount of 10 rubles).

6. To record new settings to the coin acceptor memory, click the **Write setting into UCA1** button.

7. Check the newly written settings of the coin acceptor pressing the **Read setting from UCA1** button.

8. Close the application, turn off the turnstile power, disconnect the cable from the computer and coin acceptor.

9. Check the position of the microswitches on the side cover of the coin acceptor (see Fig.31):
   - **SW1, SW2** must be in the ON position - corresponds to a pulse time of 100 ms;
   - Using **SW3, SW4, SW5** and **SW6** microswitches, select the denomination of the coins accepted by the coin acceptor (1 ruble, 2 rubles, 5 rubles and 10 rubles, respectively): to prohibit coins of the corresponding denomination, set the microswitch to OFF position, to allow – to ON position (in this case, the set amount for the passage **Value of Pulse** must not contradict the nominal value of the allowed coins);

   **Note:**

   Upon delivery, the coin acceptor is programmed to accept standard Russian coins. To accept coins (tokens), different from the standard Russian coins, it is necessary to reprogram the coin acceptor with the help of a special programming tool and software (supplied by the coin acceptor manufacturer).

   - **SW7** – not used;
   - **SW8** must be in the **ON** position - corresponds to a low-level pulse (relay closing) when receiving the amount specified in the **Value of Pulse** field.

   **Attention!**

   Changing the positions of the microswitches is carried out only when the coin acceptor is off.

10. Turn on the coin acceptor power and check if it accepts the set amount.