PERCo

Electromechanical Tripod Turnstile with Automatic Anti-Panic Arms

TTR-08A

ASSEMBLY AND OPERATION MANUAL

CE EAC

Electromechanical Tripod Turnstile with Automatic Anti-Panic Arms

TTR-08A

Assembly and Operation Manual

CONTENT

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 **TTR-08A electromechanical tripod turnstile with automatic anti-panic folding arms** 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 **TTR-08A** electromechanical tripod turnstile with automatic anti-panic folding arms (hereinafter - the turnstile) is designed for managing pedestrian flows at entrance points of industrial facilities, banks, administrative buildings, retail outlets, railway terminals, airports providing free passageway in emergency situations.

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 (up to +55°C under the shelter) and at relative air humidity of up to 80% 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.

3 TECHNICAL SPECIFICATIONS

Operating voltage	12±1.2 V DC[1]
Consumption current	max. 6A
Power consumption	max. 72 W
Throughput rate in the free passage mode	60 persons/min
Throughput rate in the single passage mode	30 persons/min
Passage width	500 mm
Arm rotation force	max. 3 kgf
RC panel cable length	6.6 m[2]
Ingress Protection Rating	IP54 (EN 60529)
Electric shock protection class	III (IEC 61140)
Mean time to failure	min. 4,000,000 passages
Mean lifetime	8 years
Turnstile overall dimensions (see Fig. 1)	777×798×1084 mm
Turnstile net weight	max 37 kg

[1] The power supply source must have load current min. 6 A within 5 sec.

[2] MAX allowed cable length – 40m (supplied on request).

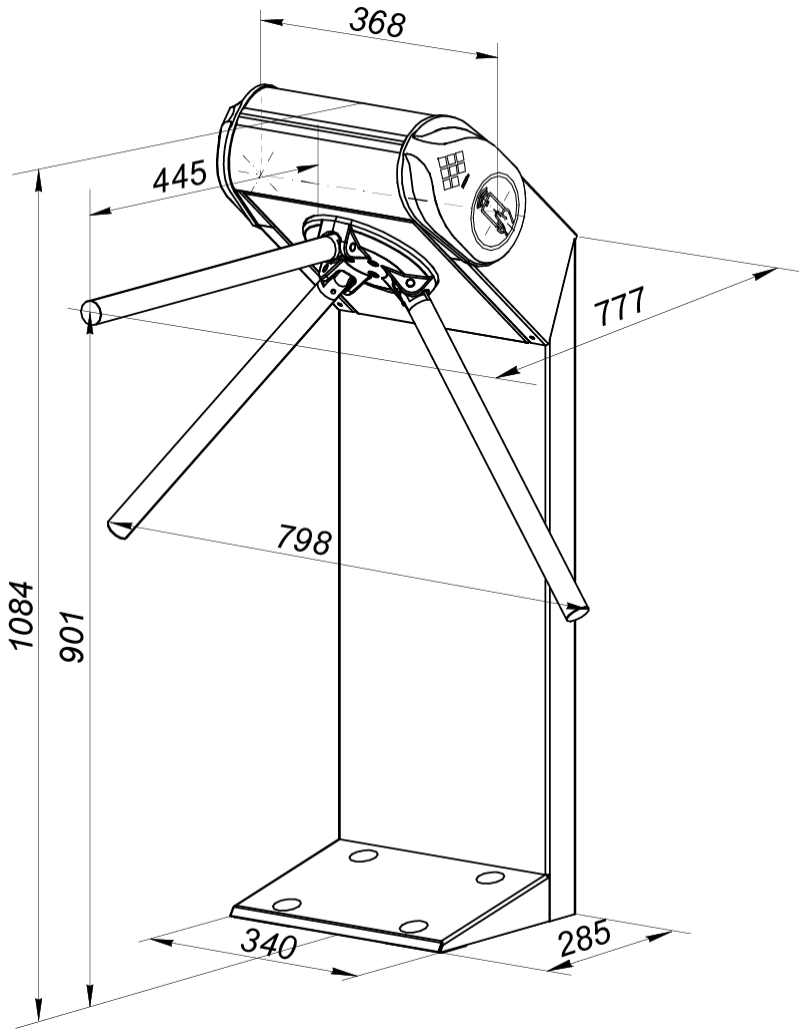

Figure 1. Turnstile overall view

4 DELIVERY SET

4.1 Standard delivery set

Basic equipment:

Turnstile housing 1
Hub with barrier arms and fastening 1
RC panel with cable 1
Allen key SW3 to remove the cover to the turnstile 1

Installation tools:

Plug 5
Self-adhesive cable tie mount 3
Nylon cable tie 100 mm 5
Anaerobic adhesive sealant for hub fixing screws (20 ml) 1

Technical documentation:

Certificate 1
Assembly and operation manual 1

4.2 Optional equipment supplied on request

WRC kit[1] 1
Intrusion detector 1
Siren (for alerts on unauthorized entry attempts) 1
Anchor bolt (SORMAT PFG IR 10-15, Finland) 4

[1] Includes a receiver and transmitter (tag) with operation range up to 40m

5 BRIEF DESCRIPTION

5.1 Main features

- The turnstile is designed either for indoor application or outdoor (see Clause 2). Turnstile housing is produced from high quality stainless steel with ABS plastic covers.
- The turnstile plastic side covers are radio transparent that allows concealed mounting of the ACS readers inside the turnstile housing.
- The turnstile can be operated from the RC panel or WRC as well as from an ACS.
- 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.
- The turnstile houses 2 LED indication displays intended for status and passage direction indication. It also features dynamic LED indication on the front side of the cover.
- The turnstile has outputs for connection of remote indicators.
- The turnstile has relay outputs for connection of an intrusion detector and a siren. A purpose-designed «Fire alarm» control input is intended for unlocking the turnstile at the fire alarm command or from emergency unblocking button.
- 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 60º 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.
- Galvanic decoupling of the outputs ensures noise-immunity of the turnstile electronics.

5.2 Design

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

The turnstile comprises a turnstile housing (1), hub (5) with three barrier arms, RC panel (13) and additional equipment not included in standard delivery set. The turnstile housing (1) is a formed and welded metal structure with a cover (2) containing the side LED indication (7) and dynamic LED indication (4).

Inside the turnstile housing there are a CLB and a self-centering mechanism consisting of a resetting device (a pusher, springs and a roller), a control mechanism with optical arm rotation sensors and a locking device, and electromechanical barrier arm unblocking device (automatic folding of barrier arm “anti-panic”) The self-centering mechanism also contains a damper, an arm rotation sensor disc and a hub (5) with three barrier arms (3).

The side LED indication (located on the cover (2)) is intended for status and direction indication: a Green Arrow indicates the direction of authorised passage (the turnstile is open in the set direction); a Red Cross indicates ban on passage (the turnstile is locked). The plastic side covers have highlighted zones for access card presentation. The LED indication on the front side of the cover lights red indicating the ban on passage and dynamic green in direction of authorised passage.

The RC panel / WRC / ACS controller (13), emergency unblocking device *Fire Alarm* (10), remote LED indicators, control mechanism and the turnstile power supply unit (9) are connected to the CLB with the cables in accordance with the connection layout (see Fig. 12).

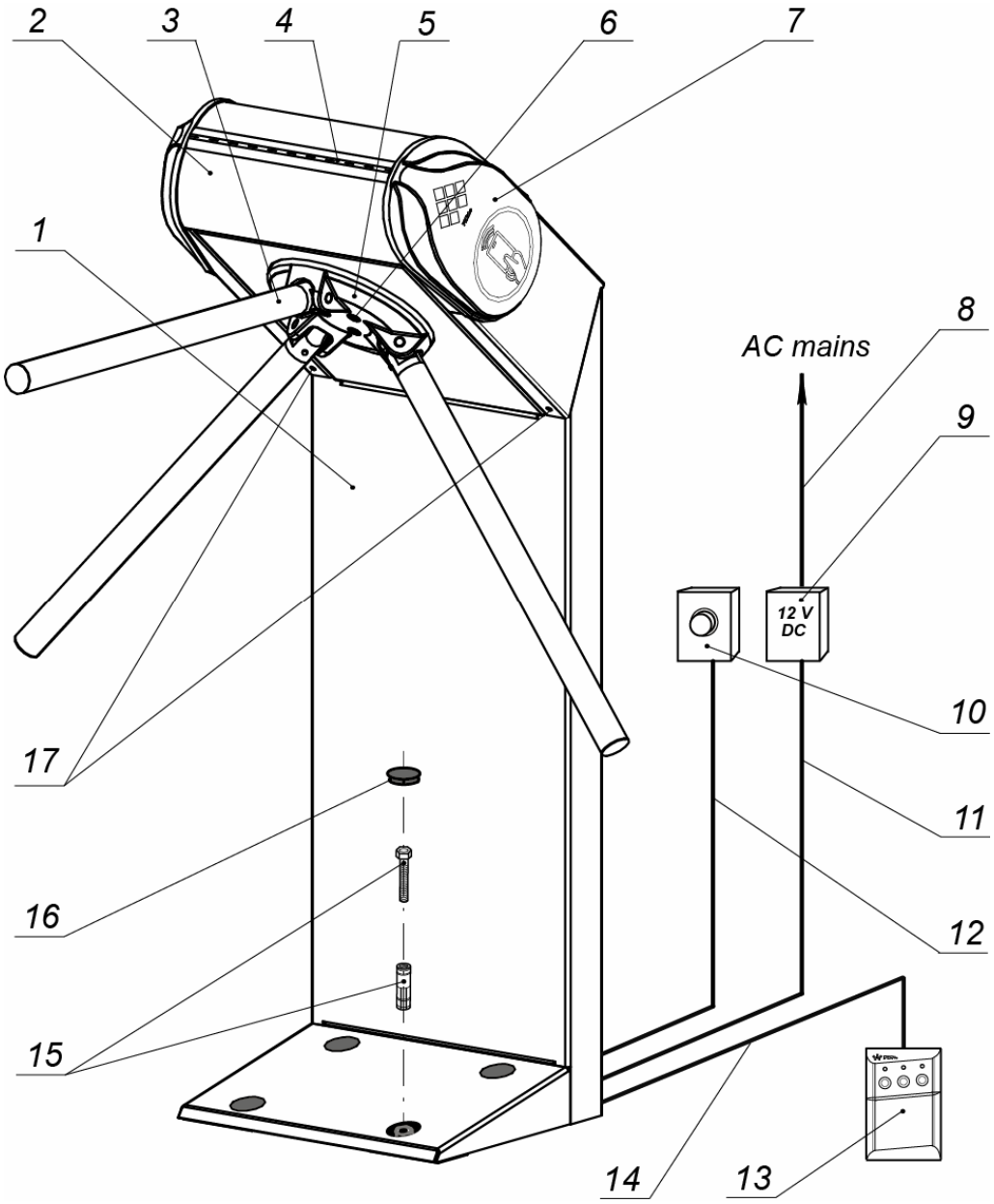

Figure 2. Turnstile components

1 – turnstile housing; 2 – cover; 3 – barrier arm; 4 – LED indication, dynamic; 5 – hub; 6 – hub fastening bolts; 7 – LED indication, side; 8 – AC power cable[1]; 9 – turnstile power supply[1]; 10 – emergency unblocking device (*Fire Alarm)*[1];11 – turnstile power cable[1]; 12 – emergency unblocking device cable[1]; 13 – RC panel (ACS controller[1]/ WRC[1]); 14 – cable of RC (WRC[1]/ ACS controller[1]); 15 – anchor bolt[1]; 16 – plug; 17 – cover screws.

The RC panel is designed as a small desktop device with a shockproof 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. 3.

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.

The RC panel is connected to the CLB with a multicore cable (14) via the ***XS1*** connector block (see Fig. 12).

[1] Not included in standard delivery set.

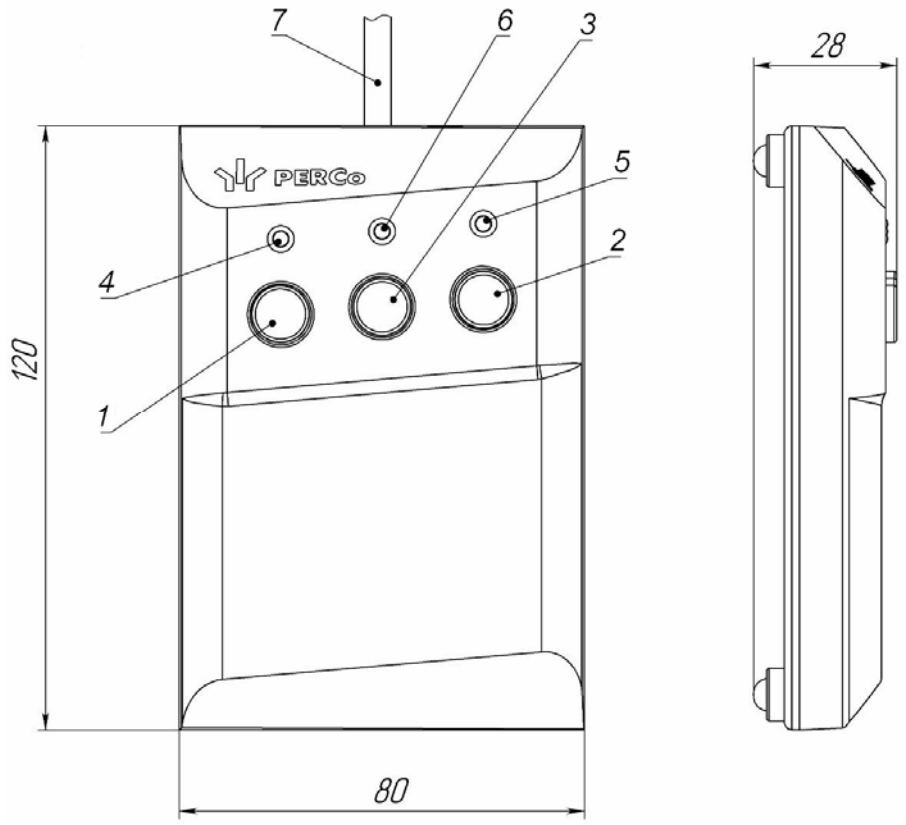

Figure 3. RC panel overall view

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.

If the turnstile orientation relatively to the operator's terminal is not standard (e.g. the terminal is placed at the backside of the turnstile housing), the RC panel orientation towards the turnstile can be changed by exchanging places of the RC wires to the contacts "Unlock A" and "Unlock B" as well as contacts "Led A" and "Led B" accordingly.

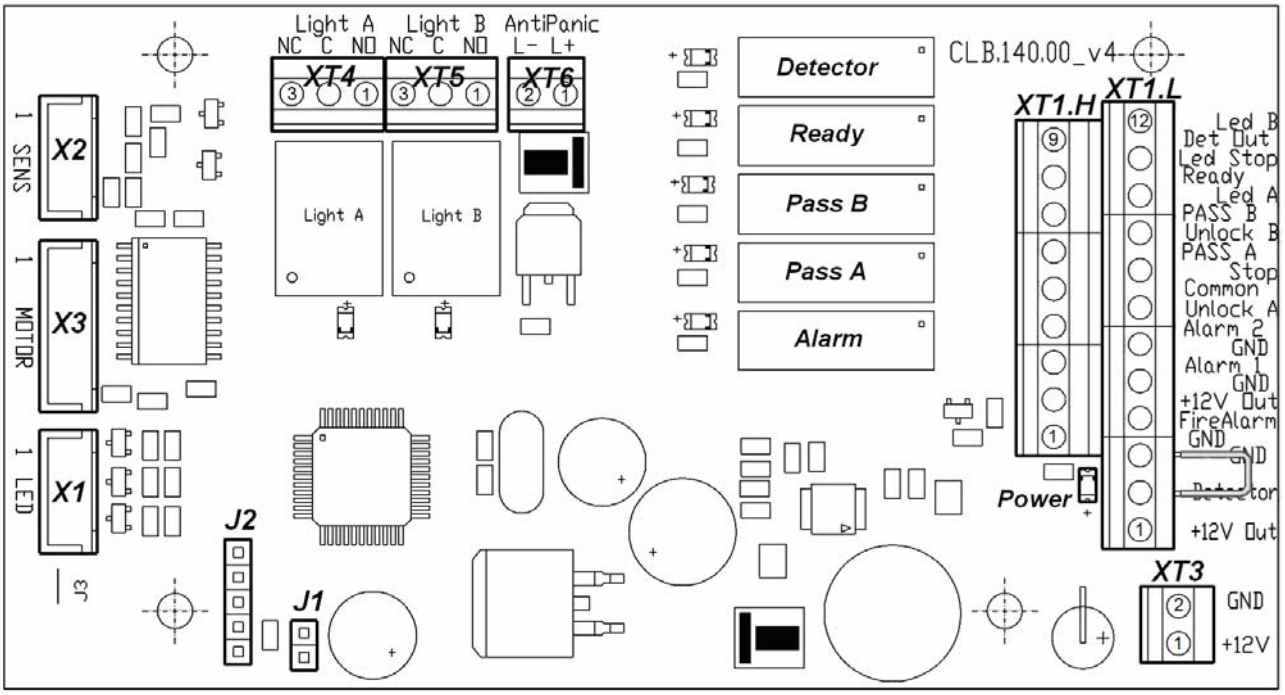

Figure 4. Control Logic Board (CLB)

The CLB (Fig. 4) includes:

- ***X1*** (***LED***), ***X2*** (***SENS***), ***X3*** (***MOTOR***) connectors to connect the indication module, optical arm rotation sensors and control mechanism with a locking device (from the X1, X2, X3 connectors with the turnstile cable);
- ***XT1.L*** (***In***) connector block to connect the RC panel / WRC / ACS controller inputs as well as an emergency unblocking device (*Fire Alarm)* and intrusion detector;
- ***XT1.H*** (***Out***) connector block to connect a siren and ACS outputs, providing the turnstile status data to the ACS controller;
- ***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;
- ***XT6*** (***AntiPanic***) connector block to connect the electromagnet of automatic anti-panic unblocking 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
- ***J2*** connector for programming.
- ***Power*** – power LED indicator on the control board.

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. 1 and 2).

Connection of the devices is made in accordance with the connection layout (Fig. 4 and 12) by the multicore cable (14) to the out connector block ***XS1*** that has contact leads with connector blocks ***XT1.L*** and ***XT1.H*** of the CLB.

The RC panel is connected to the contacts *GND*, *Unlock A*, *Stop*, *Unlock B*, *Led A*, *Led Stop* and *Led B* of the ***XS1*** connector block.

The WRC is connected to the contacts *GND*, *Unlock A*, *Stop* and *Unlock B* of the ***XS1*** connector block. Power supply of the WRC is connected to the contact *+12V* of the ***XS1*** connector block.

The ACS controller outputs are connected to the contacts *GND*, *Unlock A*, *Stop* and *Unlock B* of the ***XS1*** connector block.

The ACS controller inputs are connected to the contacts *Common*, *PASS A*, *PASS B* of the ***XS1*** 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. 12.

5.4 Input and output signals and their parameters when operating the turnstile

The CLB microcontroller processes the incoming commands (i.e. traces the status of the contacts *"Unlock A", "Stop", "Unlock B"* and *"Fire Alarm"*), keeps track of the signals from the optical arm rotation sensors and from the intrusion detector (contact *"Detector"*), and basing on those signals,

generates commands to the control mechanism and to the external devices – indication on the RC PANEL (“*Led A”, “Led Stop”* and *“Led B”*), the signal of hub turning in the corresponding direction (“*PASS A”* and *“PASS B*”), the signal of the turnstile ready for a current command (“*Ready*”), the alarm output signal (“*Alarm*”) — and relays the signal of the current status of the intrusion detector (“*Det Out*”).

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. 5 and 6).

Note:

For generating of a high-level signal at all the input contacts (*Unlock A*, *Stop*, *Unlock B*, *Fire Alarm* and *Detector*) 2kOhm resistors connected to the power supply bus “+ 5V” are used.

The control element must provide the following signal characteristics:

the relay contact as the control element:

minimum switched current, *mA* ..... no more than 2

closed contact resistance

(with the resistance of the connected cable), *Ohm* ..... no more than 300

the circuit with open-collector output as the control element:

voltage at the closed contact

(low - level signal at the CLB input), V ..... no more than 0,8

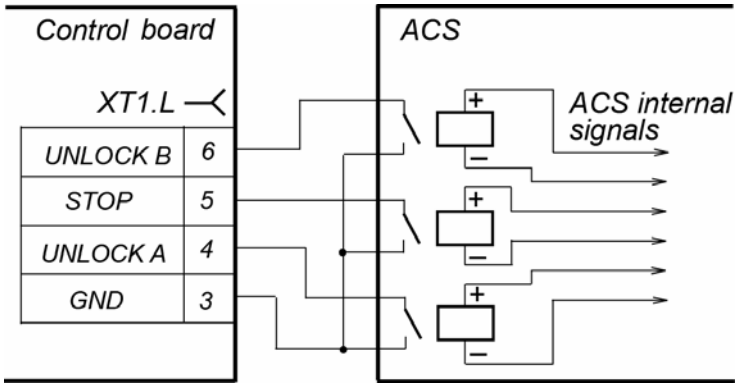

Figure 5. ACS control element — normally open relay contact

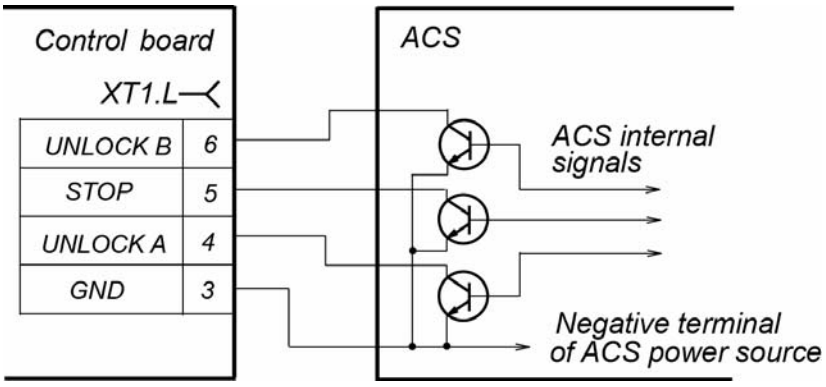

Figure 6. ACS control element — circuit with open-collector output

The relays PASS A (contacts *PASS A* and *Common*), *PASS B* (contacts *PASS B* and *Common*), *Ready* (contacts *Ready* and *Common*), *Detector* (contacts *Det Out* and *Common*) and *Alarm* (contacts *Alarm 1* and *Alarm 2*) have normally open contacts. The “*Common*” contact, at that, is not connected to the CLB power supply negative terminal.

In the initial (inactive) state, when the power is on, the relay contacts "*PASS A*", "*PASS B*", "*Ready*" and "*Detector*" are closed (voltage is supplied to the relay coil) and the "*Alarm*" relay contacts are broken (voltage is not supplied to the relay coil).

The CLB relay operation/release is indicated by lighting up/going down of the red test indicators located near the corresponding relays (Fig. 4).

The output cascades for *PASS A*, *PASS B*, *Ready*, *Det Out* and *Alarm* are the contacts with the following signal characteristics (Fig. 7):

maximum commutation voltage.....42V DC
maximum switched current.....0.25A
closed contact resistance.....no more than 0.15 Ohm

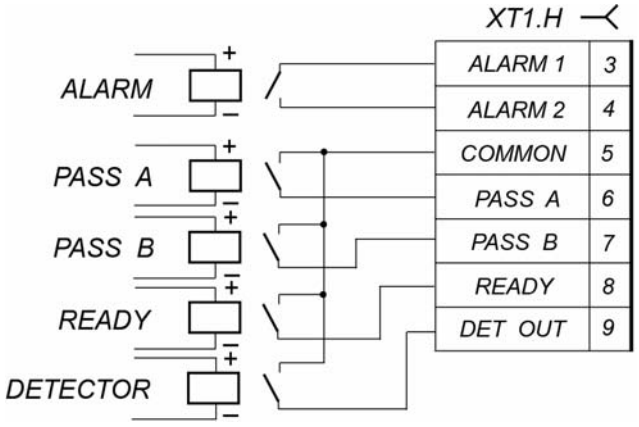

Figure 7. Output cascades for PASS A, PASS B, Ready, Det Out and Alarm

5.5 Control modes of the turnstile

There are two modes of the turnstile control - **a pulse control mode and a potential control mode**. They determine available **operating modes** of the turnstile (Tables 3 and 4).

The control mode is set by the jumper on the **J1** connector (the J1 connector location is shown on Fig. 4 and on a label located on the inner surface of turnstile cover (2)): 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.

Control over the turnstile is effected by input of the control signal to the turnstile at both control modes. The passage waiting time in the pulse control mode is 5 seconds regardless of the control signal length. In the potential control mode the passage waiting time equals the length of the control signal.

The pulse control mode is intended for the turnstile operation from the RC panel, the WRC or the ACS controller, outputs of which support the pulse control mode.

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

Special control input: *Fire Alarm*.

See Table 3 for the turnstile operating modes at this control mode. The algorithm of control signals at the pulse mode is stipulated in Appendix 1.

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

See Clause 5.10 for the turnstile operation at special "Fire Alarm" control input.

The potential control mode is intended for the turnstile operation from the ACS controller, outputs of which support the potential control mode (for example, a lock controller).

Standard control inputs: *Unlock A* and *Unlock B*.

Special control inputs: *Stop* and *Fire Alarm*.

See Table 4 for the turnstile operating modes at this control mode. The algorithm of control signals at this mode is stipulated in Appendix 2.

The minimum input signal duration, when the operating mode can be changed, should be 100

msec. The passage waiting time is equal to the low-level signal duration (the turnstile remains open in the set direction if a low-level signal exists at the set direction input by the moment of passage).

At the low-level signal inputting to the "*Stop*" input, both directions are locked for the time of the signal duration regardless the signal strength at the inputs "*Unlock A*" and "*Unlock B*". At the low-level signal removing from the "*Stop*" input, the directions are set to the control mode according to the signal strength at the inputs "*Unlock A*" and "*Unlock B*".

See Clause 5.10 for the turnstile operation at the special "Fire Alarm" control input.

5.6 Operation with the RC panel

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

Operation logic of the turnstile at the single passage in the A(B) direction at the pulse control mode:

1. When the button, corresponding to the A (B) passage direction, is pressed on the RC panel, the closing of the contact "*Unlock A(B*)" to the contact "*GND*" occurs (i.e. forming of the low-level signal on the contact "*Unlock A(B*)" relatively to the contact "*GND*").
2. The CLB microcontroller processes the incoming command and generates the command to the control mechanism, which opens the A (B) passage direction (lifts the upper (lower) edge of the key holt).
3. The microcontroller traces the status of the optical arm rotation sensors, which become active/passive in a certain consequence at the barrier arm rotation, and counts the time passed since the moment of pushing the RC button corresponding to the permitted passage direction A (B).
4. At the barrier arms turning at 67° the microcontroller forms signal "*PASS A (B)*" (breaking the contacts "*PASS A (B)*" and "*Common*" takes place).
5. After the barrier arms turning at 67° or after 5 seconds since the moment of pushing the RC button corresponding to the permitted passage direction A (B), the microcontroller generates a command to the control mechanism, which closes the passage direction A (B) (drops down the upper (lower) edge of the key holt).
6. When the barrier arms reset to home position (barrier arms turning at 112°), the microcontroller removes the signal "PASS A (B)" (contacting the "PASS A (B)" and "Common" takes place).

The "Always free" operating mode particularity: in this mode the command described in step 5 is not generated and the set passage direction remains open.

5.7 Operation with the WRC

Control over the turnstile with the WRC is similar to that with the RC panel.

The buttons on the WRC tag act the same way as those on the RC panel.

The WRC operation manual is supplied with that device.

5.8 Operation with an ACS controller

In the pulse control mode control over the turnstile with an ACS controller is similar to that with the RC panel.

In the potential control mode control over the turnstile with an ACS controller is similar to that with the RC panel and lies in forming of low-level signal on the contacts "Unlock A", "Stop" and "Unlock B" relatively to the contact "GND".

The difference of the operation logic in the potential control mode and in the pulse control mode (Clause 5.6): the command to the control mechanism, which closes the passage is generated **only** at the moment of releasing the RC button, corresponding to the passage direction A(B).

Therefore, for arranging single passages in the potential control mode it is recommended to remove the control low-level signal at the beginning of the "*PASS*" signal for the corresponding direction.

The passage through the turnstile in the A (B) direction is fixed in accordance with the status of the output contacts "*PASS A(B)*" and "*Common*".

5.9 Additional devices connectable to the turnstile

The following external devices can be connected to the turnstile:

- intrusion detector;
- siren;
- emergency unblocking device "*Fire Alarm"* (10);
- remote indicators.

The intrusion detector is connected to the ***XT1.L***, connector block, and the siren is connected to the ***XT1.H*** connector block of the CLB according to the connection layout (Fig. 4 and Fig. 12). There should be normally closed contacts on the intrusion detector.

In case the intrusion detector is not connected, there should be placed a jumper between the contacts *Detector* and *GND* of the ***XT1.L*** connector block. The jumper is delivered with the initial settings.

Caution!

Installation of the intrusion detector is made in accordance with the passage zone layout and climatic resistance of the detector.

If the turnstile is locked (the "*Always locked*" mode /"*Both directions closed*" mode when both directions are locked, Tables 3 and 4) and a signal comes from the intrusion detector, the "*Alarm*" signal is generated. The *"Alarm"* signal is disabled after 5 sec. or by executing of any received command. The signal from the intrusion detector is ignored for the period of authorized unlocking of the turnstile in either or both directions.

If within 3 sec. after the "*Always locked"/"Both directions closed*" mode is set, the signal from the intrusion detector comes, it is also ignored.

The intrusion detector status signal is constantly transmitted to the "*Det Out*" and "*Common*" contacts of the CLB ***XT1.H*** connector block (Fig. 4).

The emergency unblocking device is connected to the contacts "*Fire Alarm"* and "*GND"* of the out connector block ***XS1*** that has contact leads with ***XT1.L*** connector block of the CLB in accordance with the connection layout (Fig. 4 and Fig. 12). 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. Operation of the turnstile under commands of the emergency unblocking device is stipulated in clause 5.10.

The remote indicators are connected to the connector blocks ***XT4*** (***Light A***) and ***XT5*** (***Light B***). At that the "*Light A*" ("*Light B*") relay is active (the voltage is supplied to the relay coil), when the "Green arrow" pictogram on the LED indication display, corresponding to the set passage direction, lights, and it is passive, when the "Green arrow" pictogram on the Led display does not light. The response/release of the relays *"Light A"* and *"Light B"* can be defined according to lighting up/going down of the red indicators, which are installed near the above mentioned relays (Fig. 4).

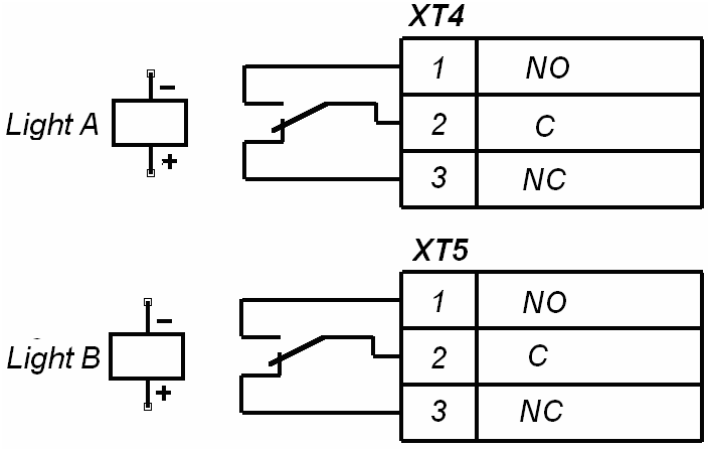

Figure 8. Output cascades for Light A and Light B

Output cascades for the “Light A” and the “Light B” relays are nonbridging relay contacts (Fig. 8) 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

5.10 Emergency unblocking of the turnstile

Emergency unblocking of the turnstile is performed by input of the “*Fire Alarm”* signal to the turnstile. At that the barrier arm automatically falls down ensuring free passage. Green indication with momentary changing into red will be activated on the side LED indication and dynamic LED indication.

If the *Fire Alarm* signal is received while the hub with folding arms is rotating, the flashing of the indication will be activated, but the emergency unblocking function will be activated only after the rotation is finished

Automatic anti-panic function is also activated at a power supply loss, e.g. breakdown of connected power supply unit.

After restore of power supply or *Fire Alarm* signal removal the arm shall be manually set into operating position, after that the turnstile is ready for further standard operation.

5.11 Operation contingencies and response

The turnstile is capable of providing information on the following operation contingencies:

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

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

In case of unauthorized access the “*Ready*” signal is formed as follows: at 8° arm rotation one of the optical sensors (Fig. 14) responds and the output contacts “*Ready*” and “*Common*” get broken (the beginning of the signal). When the barrier arms reset to home position, the both optical sensors become passive and the output contacts “*Ready*” and “*Common*” get closed (the finish of the signal).

In case of delay of an authorized passage for more than 30 sec. the signal “*Ready*” is formed as follows: if within 30 seconds from the moment of passage commencing, which is determined by the arm rotation at no less than 8° (i.e. activation of one of the optical sensors), the reset of barrier arms to home position does not happen, the output contacts “*Ready*” and “*Common*” break (the beginning of the signal). When the barrier arms reset to home position, the both optical sensors become passive and the output contacts “*Ready*” and “*Common*” are closed (finish of the signal).

When one or both of the optical sensors become out of order, the output contacts “*Ready*” and “*Common*” get broken (the beginning of the signal “*Ready*”). After fault removal the closed status of the contacts “*Ready*” and “*Common*” is renewed.

6 MARKING AND PACKAGING

The turnstile has the marking on the turnstile housing in the form of a label located on the inner panel of the turnstile housing. The label contains manufacturer’s trademark and contact details, year and month of production, operating voltage and power consumption of the turnstile.

To get access to the label it is necessary to take off the turnstile cover (2) in the following way:

1. Unscrew the fixing bolts of the cover (17) using the Allen key S3.
2. Carefully lift up the cover and release from fasteners by moving it in passage direction. Please pay attention for not to break the inner cables.
3. Separate the cable ***S1*** connector connecting the cover with turnstile housing.
4. Carefully take off the cover and lay it on a plain and steady ground.

The complete delivery set of the turnstile (Clause 4.1) is packed in a transportation box, which keeps it undamaged during the transportation and storage.

Transportation box dimensions (L × H × W) ..... 1190×450×420 mm
Transportation box weight (gross) ..... no more than 53 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 the Manual.

Safety requirements on the power supply units operation are shown in their certificates.

8 INSTALLATION INSTRUCTIONS

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

8.1 Installation details

Correct turnstile installation provides its functionality and lifetime. Please carefully study and follow the installation instructions.

It is recommended:

- to mount the turnstile on steady and level concrete (grade 400 or higher), stone or similar foundations at least 150mm thick;
- to level the foundation so that the anchoring points of the turnstile lie in the same plane;
- to apply reinforcing elements (400×400×300mm) for installation on less steady foundation (frame foundation, for example).

To ensure accurate passage tracking, when the turnstile is operated from an ACS, it is recommended to create 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. 9).

The turnstile is equipped with the resetting device that operates as follows:

- o at the barrier arm turning at the angle of more than 60°±5° the reset is effected in the direction of movement and the turn of barrier arm to counter direction is not possible (blocking of return passage);
- o at the barrier arm turning at the angle less than 60°±5° the reset is effected in the counter to the movement direction (reset to home position).

When planning the passage area, it is necessary to arrange additional emergency exit. For example, it can be the automatic rotary section ***BH-02*** (Clause 9.4).

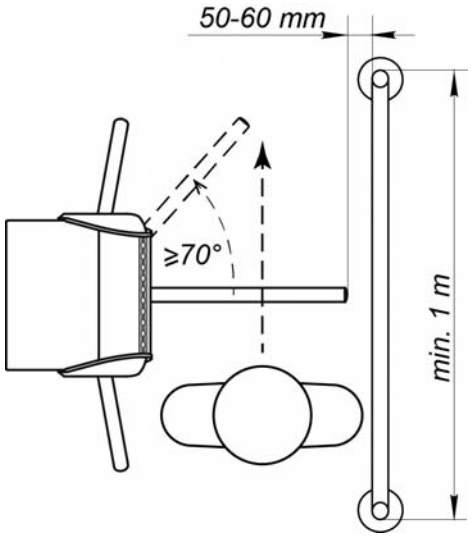

Figure 9. Site preparation. Recommendations

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 No.2;
- Cross-head screwdriver;
- Horn-type and socket wrenches: S17, S13 and S10;
- Set square 90º;
- Allen key S3;
- Level;
- Measuring tape (2 m);
- Hard wire 1.5 m long for cable pulling;
- 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

Table 1. Cables, used at the installation

№	Equipment	Cable length, m, max	Cable type	Cross-section, mm, min	Example
1	Power supply	10	Twin cable	1.5	AWG 15; HO5VV-F 2×1.5
		15	Twin cable	2.5	AWG 13; HO5VV-F 2×2.5
2	- *Fire Alarm* - Optional equipment to control board input and output	30	Twin cable	0.2	RAMCRO SS22AF-T 2×0.22 CQR-2
3	RC panel	40	Eight core cable	0.2	CQR CABS8 8×0.22c
4	ACS controller	30	Six core cable	0.2	CQR CABS6 6×0.22c

8.4 Installation procedure

Caution!

The Manufacturer does not incur liability for the damage to the turnstile and other equipment and other losses resulting from the turnstile incorrect installation and no claims from the Customer are accepted if the installation is made without following the instructions of the given Manual.

The turnstile connection layout is given in Fig. 12. The CLB connectors location is shown in Fig. 4. Cables parameters and their length are given in clause 8.3. The installation surface and passage area recommendations are given in clause 8.1.

1. Unpack the turnstile check the completeness as per Chapter 4.
2. Make the holes for anchor bolt (15) sleeves for the turnstile housing installation (Fig. 10).
3. Install the turnstile power supply unit (9) in its place (see power supply unit certificate for installation procedure of the turnstile power supply).
4. If you lay out cables under the floor surface, make an electric raceway to the cables entry zone of the turnstile housing (shown in Fig. 10).

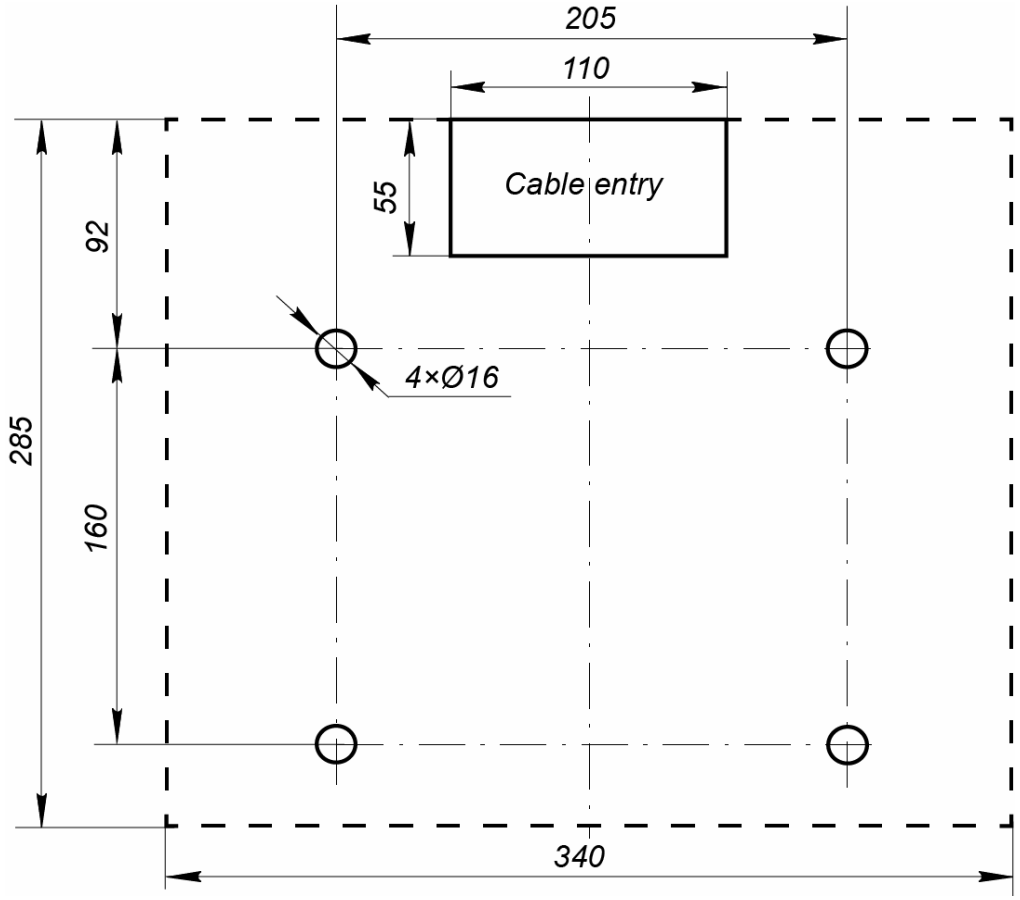

Figure 10. Floor anchor position and cable entries for housing installation (turnstile housing is dotted)

5. Insert sleeves for anchor bolts into the holes so that they do not stick out above the floor surface.
6. Remove the cover (2) in order given in Chapter 6.
7. Remove the reinforcement plate (see Fig. 11). To do so first loosen 4 fixing screws of the plate with the flat slot screwdriver.
8. Remove the back panel of the turnstile. To do so move it up along the turnstile housing until it is unengaged from the housing. The back panel is equipped with two pairs of engagement grips located on its upper and lower part.

Caution!

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.

9. Lay the cables in the electric raceway and inside the turnstile housing.
10. Install the turnstile housing on anchor sleeves and fix it with M10 bolts using S17 socket wrench. Check the position of the housing with the level.

11. If it is necessary to set up the turnstile into potential control mode remove the jumper on the ***J1*** connector of the CLB.
12. Connect the RC panel cable (14) (WRC / ACS controller) to ***XS1*** connector block.

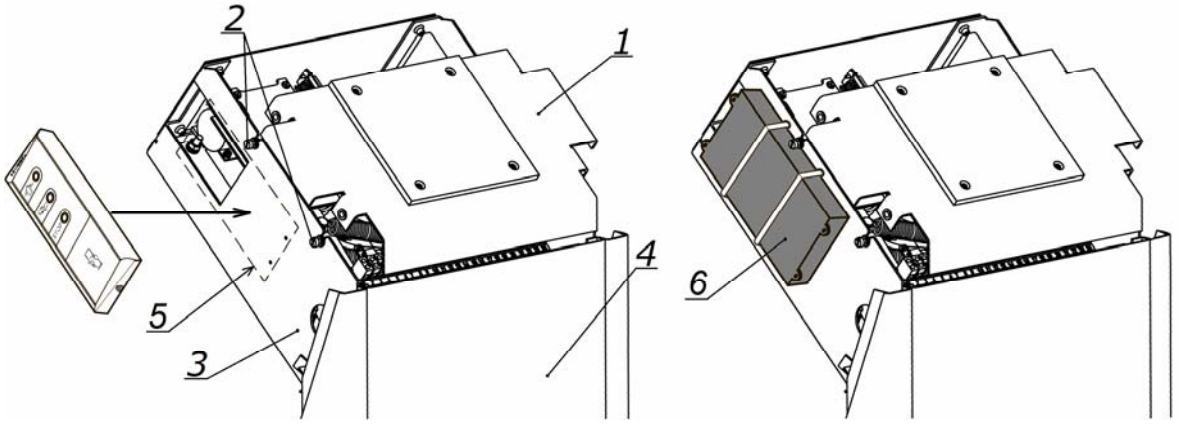

Figure 11. Turnstile with cover removed

1 – reinforcement plate; 2 – fixing screws of reinforcement plate;
3 – turnstile housing; 4 – back panel; 5 – readers installation place; 6 – ***MR07 OEM*** reader

13. Connect the additional equipment if necessary (intrusion detector and a siren; emergency unblocking device (*Fire Alarm)*; remote indicators).
14. Connect the power cable (11) from the turnstile power supply to ***XS1*** connector block.
15. If needed, install an ACS controller in the space provided for this. If the dimensions of the access control controller permit (no more than 240×200×35 mm), then it is possible to install it inside the turnstile on the frame under the back cover.
16. If needed, install the proximity card readers into the special places, situated in the housing (5 in Fig. 11).

Caution!

The turnstile design allows installation of ***IR03.1***, ***MR07 OEM***, ***RP-15.2*** readers, as well as third-party readers. Readers are not included in the standard delivery set of the turnstile! The choice of readers, their acquisition and installation is carried out by the customer (installer) independently. Third-party readers must meet the following requirements:

dimensions (length × width × height) ..... max 145×90×25 mm
card reading distance ..... min 50 mm

In case of use of card readers with read range fewer than 5 cm, the steady reading of cards during their validation is not guaranteed[5].

In the turnstile housing there are two threaded holes for attaching readers ***IR03.1***. To install other types of readers, you can install them with double-sided tape, as well as with screws or plastic ties, drilling holes in place. To do this, drill holes in place (see. Fig. 11). To connect card readers use free contacts (15 - 24) of the ***XS1*** connector block.

17. Check serviceability and accuracy of all the electrical connections. Fasten all the cables in two points to the hole in the turnstile housing horizontal plane, using hook and loop cable ties.
18. Install the back panel in reversed order.
19. Install the reinforcement plate on the turnstile in reversed order.
20. Connect the indication board cable header to the ***S1*** connection slot.
21. Mount the cover with LED indication back into its place in the reverse order. When the cover with LED indication mounting is carried out correctly it does not need much effort. Fasten the cover with the bolts.
22. Install the hub (5) with the barrier arms (3) in the following order:

[5] PERCo produces IP-based entrance control systems KT-08.3A with similar design which has got built-in ACS controller and built-in card-readers. Their read range is at least 6 cm from the turnstile's cover.

- Insert the hub into a corresponding mounting face on the turnstile mechanism shaft.

Caution!

For proper hub installation before the final tightening of the bolts, barrier arm is to be shifted into a horizontal position and a 90º degree angle in the horizontal between the barrier arm and the turnstile housing is to be set with a set square.

- Fix the hub with three hub fastening bolts with spring washers (6), preliminarily for reliable fixation of the bolts put on the bottom of their threads a bit of adhesive sealant from the delivery set. Bolts' tightening is to provide solid hub fixation regarding the turnstile mechanism shaft (without gaps and mismatches).

23. Install the plugs (16).

Run a test switch on of the turnstile as specified in clause 9.1 *«Power-up»*.

Table 2. Connection layout description

Legend	Name	Q-ty	Note
A1	Control mechanism	1	
A2	Turnstile cover	1	
A3, A4	Indication blocks, side (IB1, IB2)	2	
A3.1, A4.1	Indication modules (IM1, IM2)	2	For IM1 – jumper in position L, for IM2 – jumper in position R
A3.2, A4.2	Lighting modules (LM1, LM2)	2	
A5	Dynamic indication module	1	
A6	Optical arm rotation sensors	1	
A7	Electric motors (M1, M2)	1	
A8	Electromagnet	1	
A9	CLB	1	CLB.140
A10	RC panel	1	
A11[1]	Turnstile power supply	1	12V, 6A
A12[1]	WRC kit	1	
A13[1]	Access control system	1	
A14[1]	Emergency unblocking device (*Fire Alarm)*	1	
A15.1[1], A15.2[1]	Remote indicators	2	RI A, RI B
A16[1]	Remote indicator power supply	1	
A17[1]	Siren	1	12VDC
A18[1]	Intrusion detector	1	
XS1	Connector block, 24 contacts	1	PSK1/12 (12) Klemmsan ×2
S1	A2 cover connection slot	1	
1	Power cable	1	
2	Control cable	1	
3	CLB indication cable	1	
4	Turnstile cover indication cable	1	
5.1, 5.2	Lighting module cables	2	
6.1, 6.2	Dynamic indication module cables	2	
7	Wire jumper. Installed when the emergency unblocking device (A14) is not connected	1	Installed on default
8	Wire jumper. Installed when the intrusion detector (A18) is not connected	1	Installed on default

[1] Supplied on request.

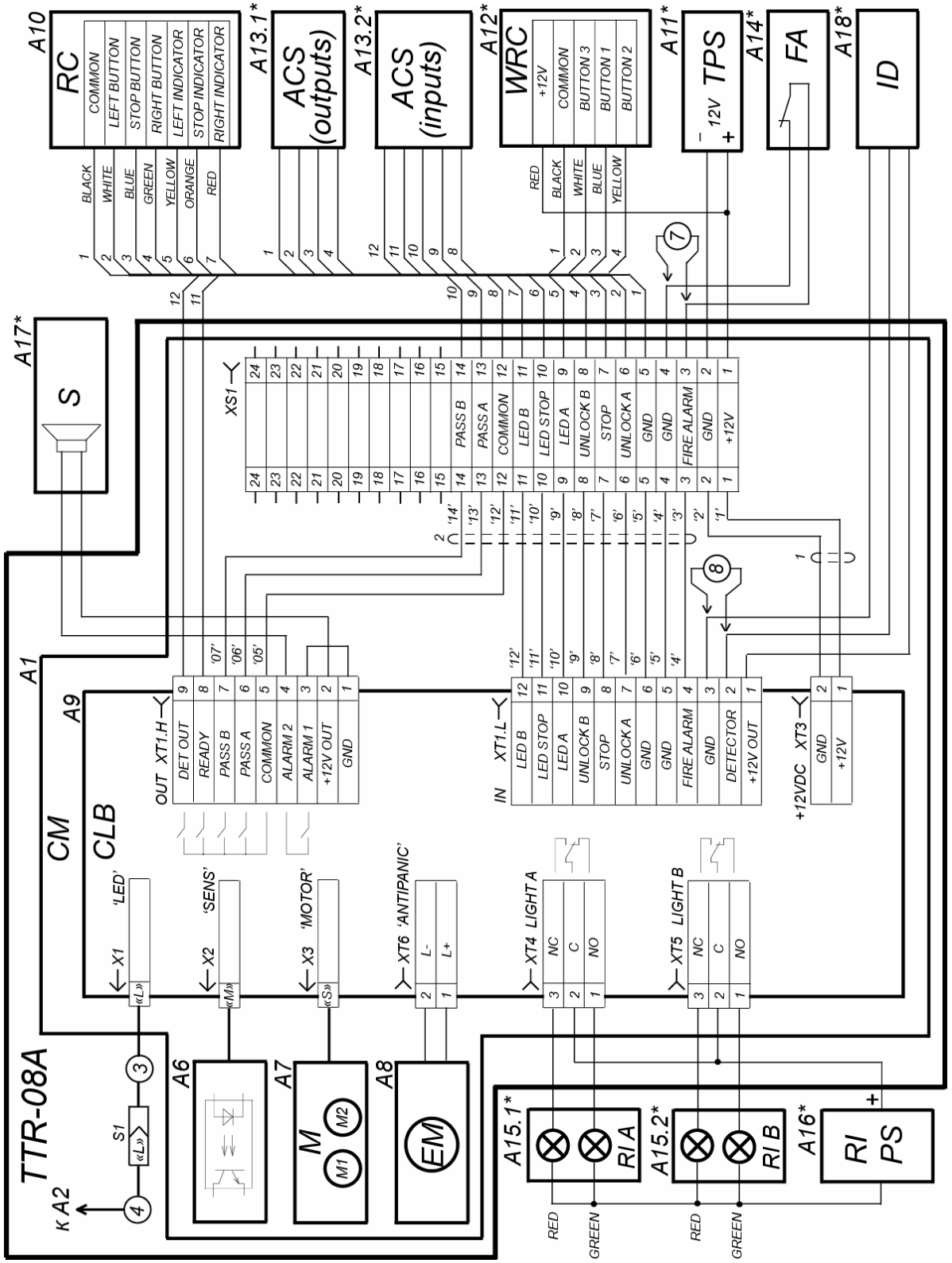

Figure 12. Connection layout[1] (description is given in Table 1)

[1] * Supplied on request.

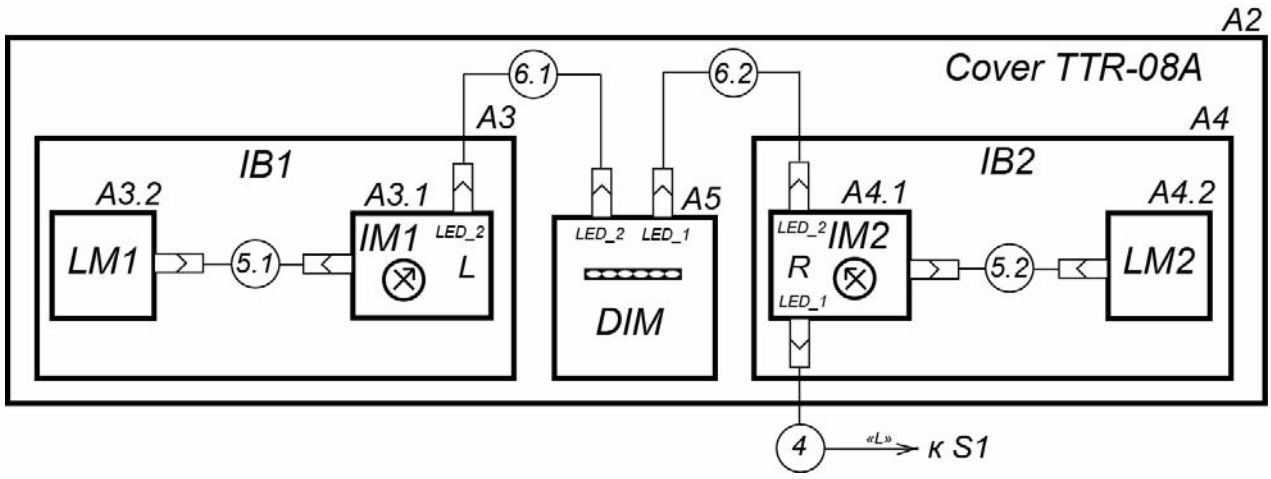

Figure 13. Turnstile cover connection layout

9 OPERATION INSTRUCTIONS

Follow the turnstile operation safety requirements (see Clause 7.2 *«Operation safety requirements»*.

It is prohibited!

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

9.1 Power-up

Follow these steps: Power-up

1. Connect the AC power cable (8) of the turnstile power supply (9) to the AC outlet with the voltage and frequency rating according to the certificate for power supply.
2. Switch on the turnstile power supply (9). At the set pulse control mode, the turnstile switches to *«Always locked»* mode. At the set potential control mode, the turnstile switches to *«Both directions locked»* mode. At the same time the red LED indication of the turnstile cover showing the ban on passage and the indicator above the **STOP** button on the RC panel (13) light up.
3. Lift up the barrier arm (3). It will be fixed automatically.
4. Check operation of the intrusion detector and siren (if included in the delivery set and installed accordingly). After the power-up wait until the moment of the test indicator (inside the intrusion detector) going off (from 10 to 50 sec). Put your hand before the intrusion detector. The continuous signal will sound when the intrusion detector activates. To eliminate that sound signal press any button on the RC panel. The sound will stop without pressing the button in 5 sec.

The turnstile is ready for operation.

9.2 Operating modes of the turnstile at pulse control mode

After switch on the power supply the turnstile is automatically switched to *«Always locked»* mode.

See Table 3 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.

Table 3. Pulse control mode (the jumper is set on the J1 connector)

The turnstile operating modes	Actions to do	Indication		Turnstile status
		on the RC panel	on the LED display	
Always locked (Locked for entry and exit)	Press the **STOP** button on the RC panel	The red indicator above the **STOP** button is on	The “Red cross” for each passage direction and “Red line” pictograms are on	The turnstile is locked
Single passage in the set direction (open for passage of one person in the chosen direction)	Press the **LEFT**/ **RIGHT** button on the RC panel	The green indicator above the button of the chosen passage direction *«Left»*/ *«Right»* is on	The “Green arrow” and “Dynamic green” pictograms in the chosen passage direction are on	When the passage is completed, the turnstile is locked
Bi-directional single passage (open in both directions for ‘one-by-one’ passage)	Press both the **LEFT** and **RIGHT** buttons on the RC panel simultaneously	The two green indicators (*«Left»* and *«Right»*) are on	The “Green arrow” for each passage direction and “Green line” pictograms are on. After the passage in the chosen direction the “Red cross” is on for that direction. After the passage in both directions the “Red line” is on.	The turnstile is locked in the direction of completed passage
Free passage in the set direction (open for free passage in the chosen direction)	Press the **STOP** button and the button corresponding to the chosen passage direction **LEFT**/ **RIGHT** simultaneously	The green indicator above the button of the chosen passage direction *«Left»*/ *«Right»* is on	The “Green arrow” in the chosen passage direction and “Green line” pictograms are on.	Turnstile remains open in the set direction
Free passage in the set direction and single passage in the opposite direction (open for free passage in the chosen direction and for passage of one person in the opposite direction)	Set the “*Free passage in the set direction”* mode for one direction and “*Single passage in the set direction”* for the other.	The two green indicators (*«Left»* and *«Right»*) are on.	The “Green arrow” for each passage direction and “Green line” pictograms are on. After the single passage the “Red cross” is 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
Always free (open for entry and exit)	Press all the 3 buttons on the RC panel simultaneously: **LEFT**, **STOP** and **RIGHT**	The two green indicators (*«Left»* and *«Right»*) are on	The “Green arrow” for each passage direction and “Green line” pictograms are on.	The turnstile remains open

Note:

Pressing the button on the RC panel corresponds to the low-level signal supply to the contacts ("*Unlock A*", "*Unlock B*" and "*Stop*") of the ***XT1.L*** connector block relatively to the contact "*GND*".

The RC panel overall view is given in Fig. 3.

- 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.
- 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.

9.3 Operating modes of the turnstile at potential control mode

See Table 4 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 4. Potential control mode (the jumper is taken off from the J1 connector)

THE TURNSTILE OPERATING MODES	LEVELS ON THE CONTACTS SHOULD BE PROVIDED	INDICATION		TURNSTILE STATUS
		ON THE RC PANEL	ON THE LED DISPLAY	
Both passage directions are locked (the turnstile is locked both for entry and exit)	The high level — on contacts *"Unlock A"* and *"Unlock B"* or low level — on the contact *"Stop"*	The red indicator above the **STOP** button is on	The "Red cross" for each passage direction and "Red line" pictograms are on	The turnstile is locked
One of the passage directions is open (the turnstile is open for passage in the set direction)	The low level — on the contact corresponding to the passage direction, the high levels — on the other contacts	The green indicator above the button of the chosen passage direction *«Left»* / *«Right»* is on	The "Green arrow" in the chosen passage direction and "Green line" pictograms are on	When the passage is completed, the turnstile is locked
Both passage directions are open (the turnstile is open both for entry and exit)	The low level — on contacts *"Unlock A"* and *"Unlock B".* The high level — on the contact *"Stop"*	The two green indicators ("Left" and "Right") are on	The "Green arrow" for each passage direction and "Green line" pictograms are on.	The turnstile remains open

9.4 Actions in emergency

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

9.5 Troubleshooting

Possible faults, which can be cleared by the users themselves, are listed in Table 5.

Table 5. Possible faults and remedy

FAULT	POSSIBLE CAUSE	REMEDY
At the power-up the turnstile doesn't work, and there is no light indication on the turnstile housing and the RC panel	No supply voltage to the CLB	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 to the CLB ***XT3*** connector block
The turnstile is not controlled in one of the directions, and there is light indication on the turnstile housing and on the RC panel	The CLB does not receive a control signal for this direction	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 to the CLB ***XS1*** connector block

10 MAINTENANCE

The turnstile housing maintenance is required once a year or in case of some technical failures. The maintenance should be carried out by qualified mechanic only.

Caution!

Prior to the turnstile maintenance works disconnect the turnstile power supply from the AC mains.

The turnstile maintenance works should be carried out in the following order:

1. Switch off the turnstile power supply. The barrier arm will automatically fall down at that.
2. Unscrew 3 M8 screws to remove the hub with the barrier arms.
3. Check security of mounting of the barrier arms (3) to the hub and if needed, tighten the barrier arms fixing screws (3).
4. Lubricate the friction units of the barrier arm drop mechanism (automatic folding of barrier arm "anti-panic") and barrier arms hinged connections to the hub with ***Energrease L21 M*** or similar lubricant.
5. Remove the cover (2) with LED indication block from the turnstile housing. The order is given in Chapter 6.
6. Remove the reinforcement plate (Fig. 11). In order to do this, loosen 4 screws, which are fixing the plate.
7. Check visually the resetting device (pusher, springs and roller), the arm rotation sensors and the damper (Fig. 14).

Caution!

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

8. Remove dust from the arm rotation sensor disc, located in the spacing of the arm rotation optical sensors, with alcohol-gasoline blend applied with a cloth. Avoid the ingress of dust on the operational spacing of the both arm rotation optical sensors.
9. Lubricate friction joints of the turnstile mechanism in the following points:
   a. with ***Chain and Rope Lube Spray - WEICON*** lubricate the rotation axis of the stoppers (1,2), roller (3) and the pusher arm (5, Fig. 14);
   b. with ***Energrease L21 M*** or similar lubricant treat the resetting mechanism springs fixing points (4, 6);
   c. with ***Chain and Rope Lube Spray - WEICON*** lubricate passageway emergency unlocking mechanism details.
10. Check the reliability of the cable connections to the CLB connector blocks and ***XS1*** out connector block and if necessary tighten the cable fixing screws.
11. Install the reinforcement cover in reverse order
12. Connect the ***S1*** cable connector of the indication board to the CLB and mount the cover with LED display (2) back into its place in the reverse order to the dismantling. When the cover mounting is carried out correctly it does not need much effort.
13. Install the hub (5) with barrier arms (3) as indicated in section 8.4
14. Check the reliability of electromechanical barrier arm unblocking device by turnstile power on / off. If necessary, lubricate the hinged connections to the hub (5).
15. Check the reliability of the turnstile housing fastening to the floor and if necessary, tighten the anchor bolts (15) with S17 socket wrench. Before it is necessary to remove plastic plugs (16) out of the holes in the turnstile housing base.

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

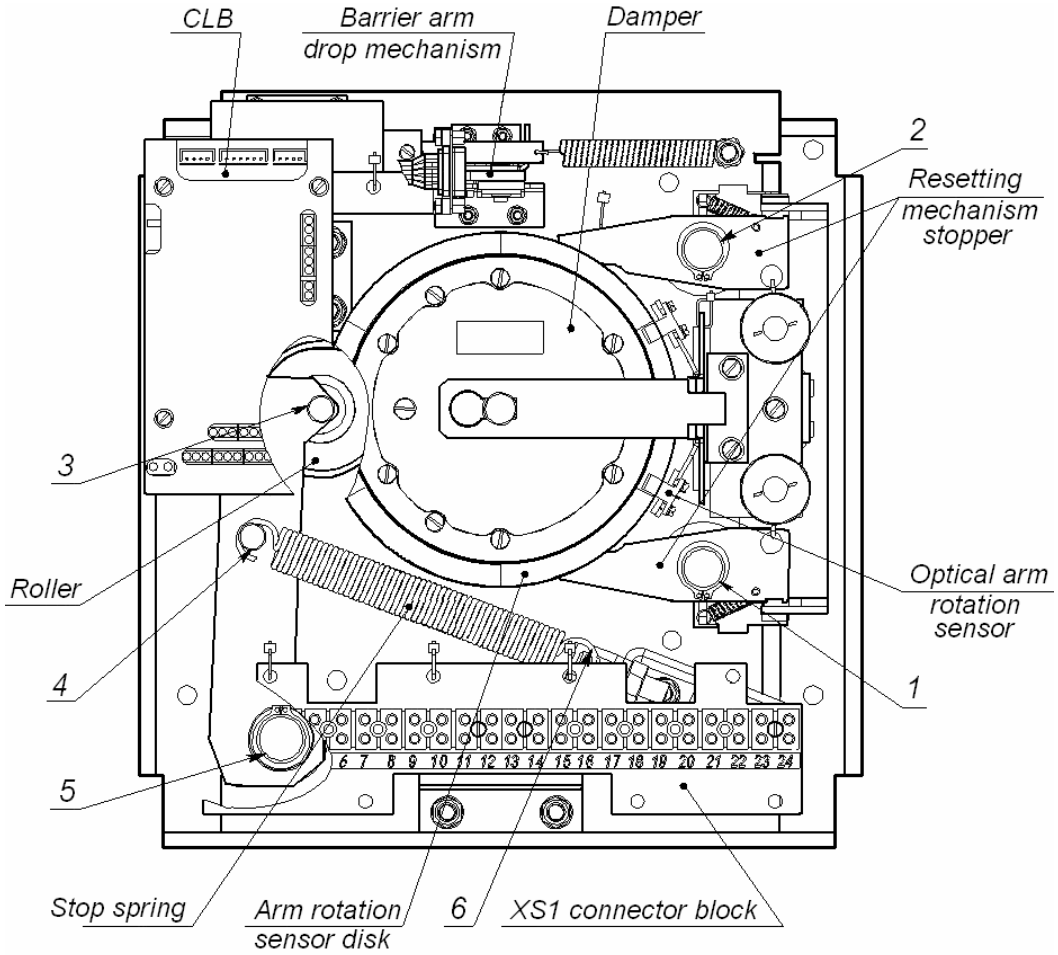

Figure 14. Location of the interior components of the turnstile mechanism

11 TRANSPORTATION AND STORAGE

The turnstile in the original package should be transported in closed freight containers or in other closed type cargo transport units. During storage and transportation, the boxes can be stacked no more than 4 layers high.

The storage of the turnstile is allowed indoors at ambient temperature from –40°C to +55°C and at relative air humidity up to 98% at +25°C.

After transportation or storage at temperatures below zero or at high air humidity, prior to the installation the turnstile must be kept in the original package for no less than 24 hours indoors at room temperature.

APPENDIX 1. 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*** 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 2. 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.

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