



User Manual for Turnstile CALISTO

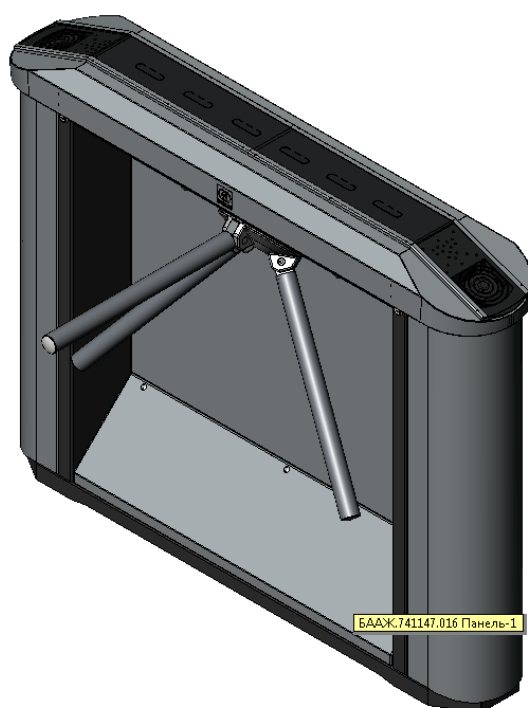


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This manual applies to the CALISTO turnstile with electric drive tripod (hereinafter referred to: the turnstile) and is designated to learn the product and to ensure its proper usage, transportation and storage.

Installation and maintenance of the turnstile should only be performed by qualified personnel, which has fully studied and understood this Operational Manual.

1. GENERAL OVERVIEW

1.1 Product applications

     CALISTO turnstile is designed for people flow control at the entrances of industrial enterprises, banks, administrative buildings, trade centers, mass transit lobbies, airports, etc.

     Turnstile can operate in the manual mode via external remote control (independently), as well as a part of Access Control System (ACS).

     Turnstile operates in response to commands transmitted to its controller.

     Conditions of operation:

- atmospheric temperature – 0... + 45° C;
- humidity – no more than 95 % with atmospheric temperature at +25° C;
- atmospheric pressure – (84...106,7) kPa (630...800 mm Hg);
- air should be free of dust, oil pollution, corrosion-active and inflammable agents of abnormal concentration.

1.2 Technical characteristics

     Power supply voltage gate (DC), V
24±3

     Power consumption, W, no more then 25

     Dimensions, mm

length 1350

width 265

height 1050

1.2.5 width of passage opening 600 mm

1.2.6 Weight (Netto) 70 kg

1.2.7 Turnstile's throughput

in "free passage" mode 60 ppl/min

in "controlled passage" mode 20 ppl/min

1.2.8 Estimated number of entrees before system fault no less then 1500000

1.2.9 Estimated unit resource 10 years

2 PACKAGE CONTENT

CALISTO turnstile (body only)	1 pc
Tripod unit	1pc
Set of anchors	2 pcs
Set of bolts	4 pcs
Transportation Box	1pc
Operational manual	1pc

3 SAFETY REQUIREMENTS

Turnstile is CE and ROHS compliant and fully complies with European safety requirements.

Installation, operation and maintenance of the turnstile can only be carried out by a person who read this "Operational Manual" and has completed the safety training.

During the installation and following maintenance of a turnstile the rules of "Safety regulations for operation of electrical equipment" must be respected, as well as provisions for safety, set by the end user organization at the site of installation.

As turnstile's source of power, only the converters with separate windings or with a protective transformer should be applied to satisfy safety requirements.

PROHIBITED:

- Operating a defective turnstile. In the event of fault detection the turnstile should be immediately disconnected from mains;
- Using defective tools and equipment for installation and servicing of the turnstile;
- Exposing the turnstile and its individual parts to shock, violating the coherence of the body, cleaning the outer surfaces with abrasives and solvents (e.g., white spirit, acetone, turpentine, etc.)

4 UNIT STRUCTURE AND PRINCIPLES OF OPERATION

4.1 Parts of the turnstile

Turnstile is a structure (Figure 1) consisting of following parts: stainless steel **8** and painted **4** body, which houses the main structural elements of the turnstile: mechanism for turning tripod **10**, tripod **2**, turnstile's controller **1**, light indicators "passage allowed / prohibited " (one on each side) **6**, readers of personal identifiers (card readers) **5**, the top cover **3**, light indicators on the top cover **7**, mounting cap **9**.

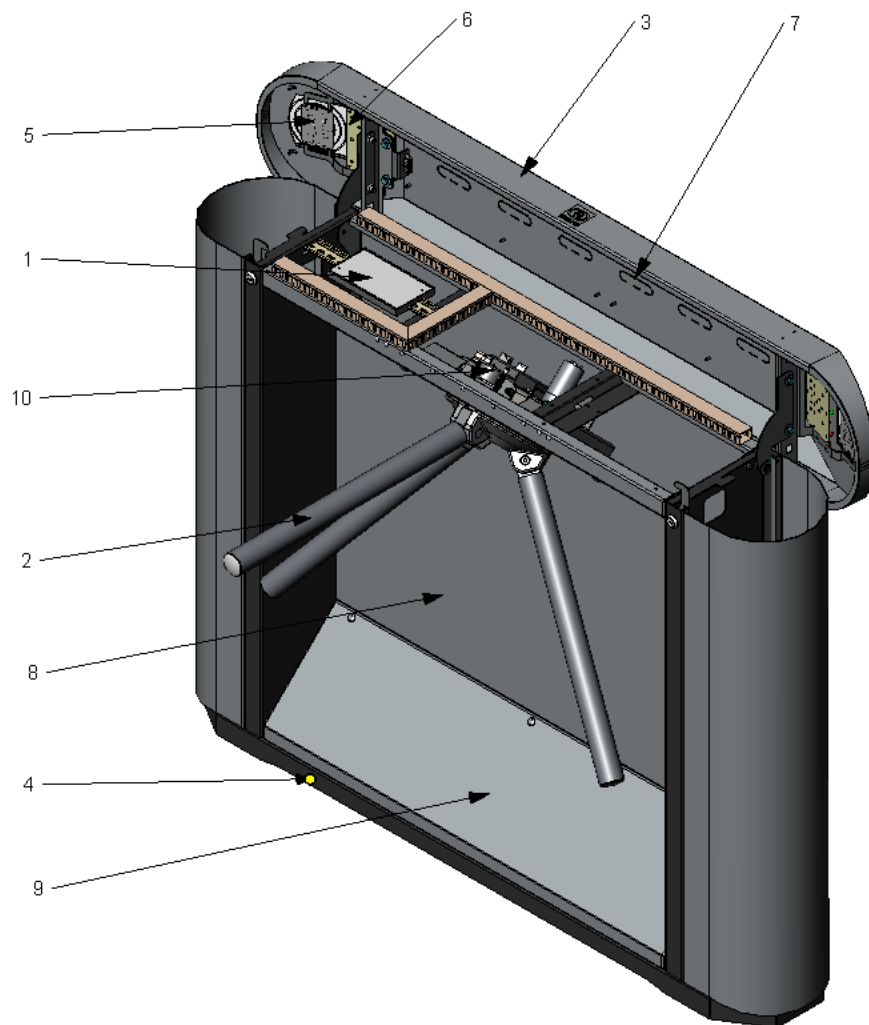


Figure 1. General view of the Turnstile

Tripod of turnstile consists of three blocking rods, tri-positioned at an angle of 120° .

4.2 Turnstile mechanics

General view of turnstile's electric drive mechanism is shown in Figures 2a and 2b. The mechanism consists of the base 4, an interlocking device 1, the "anti-panic" device 2, motor 5 with the belt drive 3. After each passage, the mechanism ensures the completion of the tripod's single turning cycle automatically and to the next "stand by" operating position of the rod.

Control of mechanism rotation is provided by the code disk with indents 8, the tripod position optical sensors 6 and 7, which inform about the progress of a passage.

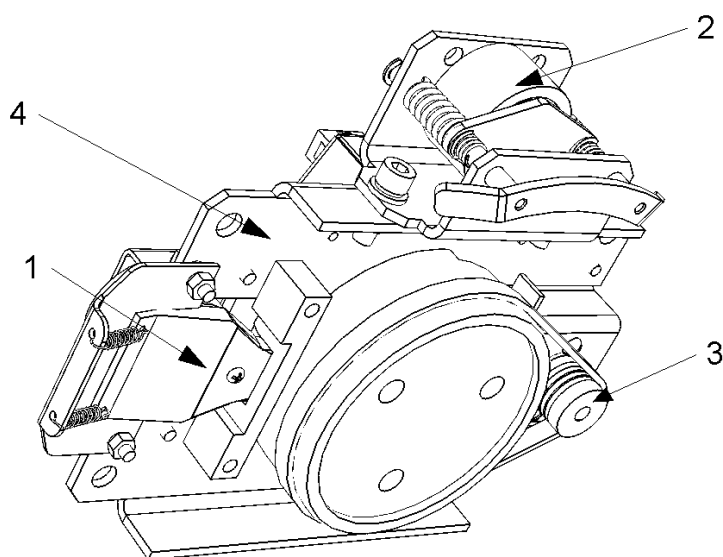


Figure 2a — Electric drive mechanism — view from the below

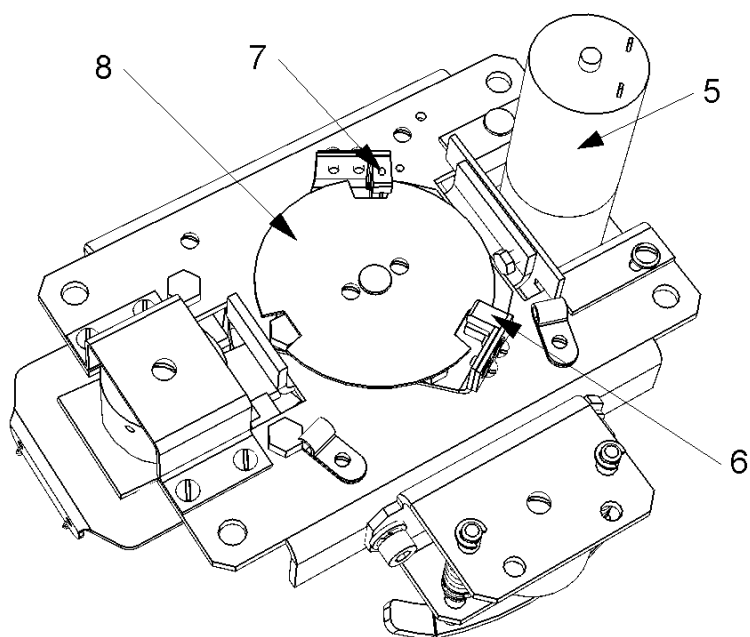


Figure 2b — Electric drive mechanism — view from the top

4.3 “Anti-Panic” system

The turnstile is equipped with a built-in "anti-panic" system that ensures immediate lowering of the blocking rod in emergency situations. The "anti-panic" function is automatically activated when there is electric power outage or when an external control signal is applied.

"Anti-panic" consists of the base with the adjustment slots, electromagnet (solenoid) **1**, yoke **5** with springs **3**.

Electromagnet **1** (hereinafter: EM "anti-panic") is always on and draws-in the plate **2**, which, in turn, holds the yoke-pusher **5** through compensatory springs **3** and **4**. When power to the electromagnet is lost, the yoke, under the influence of spring, hits on the thorn of a tripod **1** (Fig. 3b), which comes out of engagement with the slot of a rod **2** (Fig. 3b). Once the voltage supply is re-established, the electric drive mechanism turns on and the rod comes up to its original position automatically.

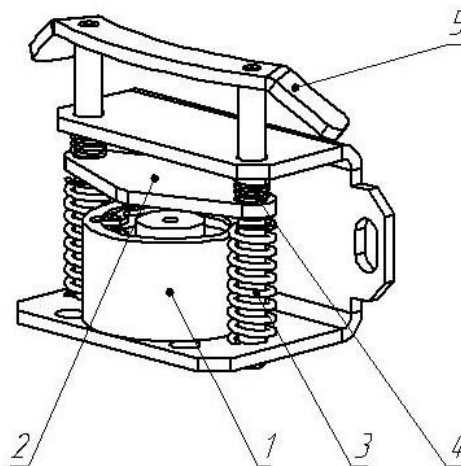


Figure 3a – “Anti-panic” system

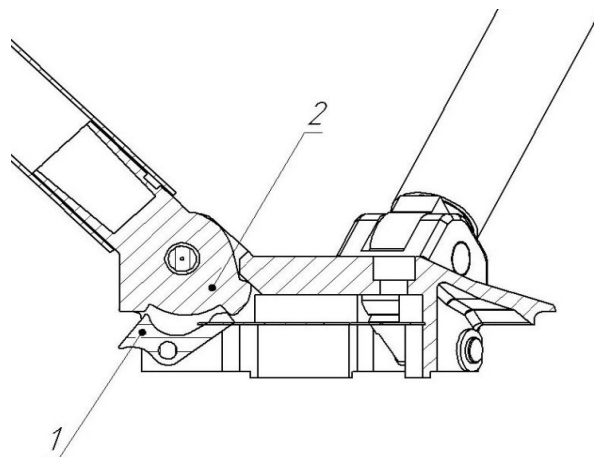


Figure 3b – Tripod mechanism

4.4 Interlocking device

The interlocking device is designed to block the tripod from rotation for control over the “entrance authorization / prohibition” feature of the turnstile. The device consists of mounting plate **1**, two springs and spring-compensated anchor **2**, nonmagnetic insulating insert **3**, the stopper arm **4**, electromagnet (solenenoid) **5**.

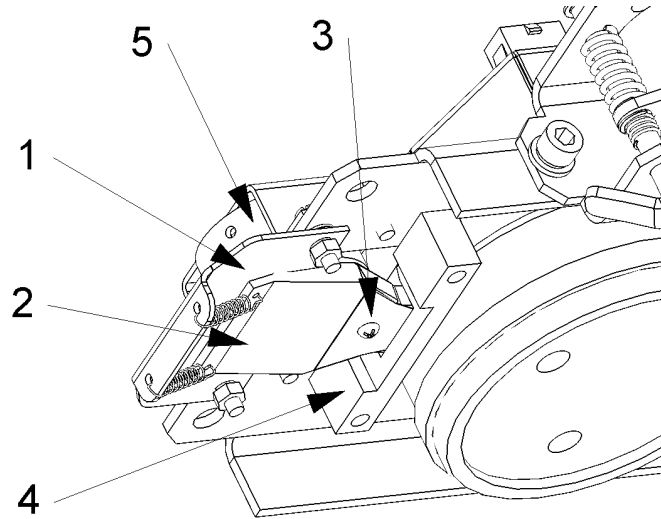


Figure 4 – Interlocking device

One of the tripod rods is usually always set to a “horizontal” position and blocks up the passageway, i.e., turnstile operates in the “normally closed” mode.

The controller lets operator to manipulate the turnstile’s functions remotely via manual remote control, or via Access Control System.

The "passage allowed / prohibited" directional indicator lights are situated on both sides of turnstile’s housing to inform about the state of a passage mode. There is an additional line of directional “running” lights situated on the top cover of the unit.

4.5 Accessing turnstile's internal components

To access the turnstile internal components (Figure 5), such as mechanism, controller, card reader, display (optional), cable communications, etc., - turn top cover locking keys **1** and tilt cover upright to a 90°. After tilting, the cover opens immediate access to the controller **2**, the reader of personal identifiers (card reader) **3**, the passageway status lights **4**.

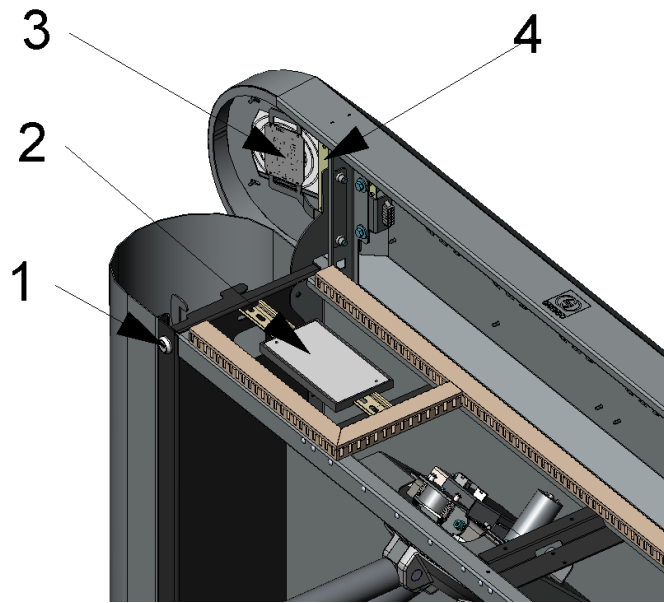


Figure 5 – Turnstile with the top cover “up”

4.6 Installation of turnstile

Turnstile is fastened to the floor with 2 anchors (supplied, heavy duty and rust-free steel), and 4 bolts (supplied, heavy duty, rust-free, from 80 to 150 mm of length). The installer should select the appropriate length of anchor bolts, depending on flooring specifics. There are special openings made in the base of turnstile to reach, use and service the anchor slots and bolts. Direct access to these is provided by a removable mounting cap **9** (Figure 1).

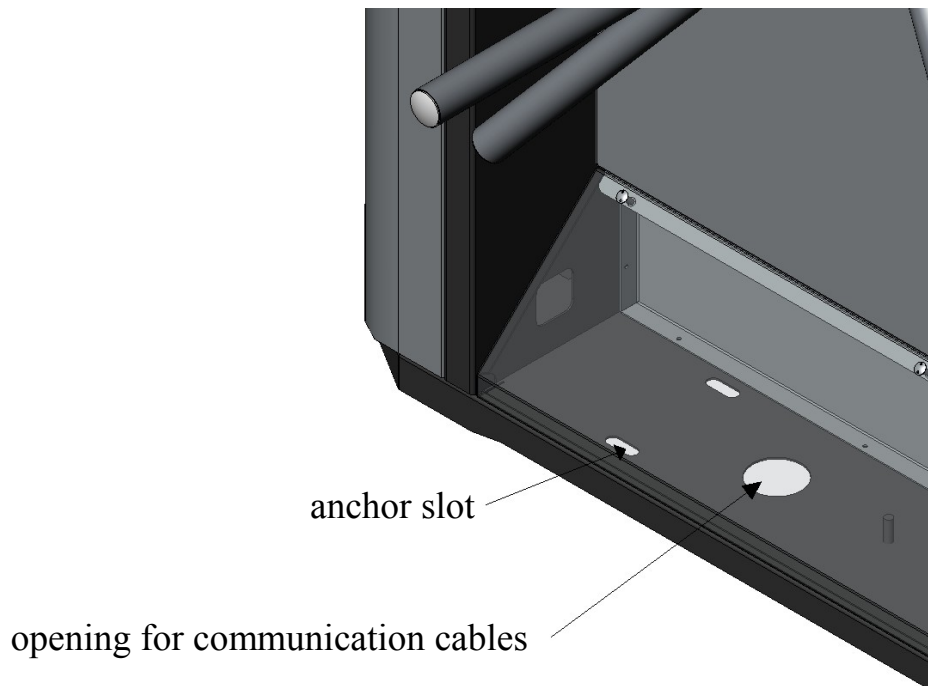


Figure 6 – openings for anchors and bolts, as well as for communication cables

For power, remote control (or Access Control System - ACS) network communication lines, it is recommended to utilize: the special communication plastic housing tubes (corrugated, heavy-duty type, supporting wires of 750 N mechanical strength). The housing should be planted in advance into the flooring. For power mains network, it's recommended to use separate tubes for power mains and for controller-ACS cabling. All network/power communications should be completely isolated from each other.

4.7 Sequence of operation

Turnstile operates under the "normally closed" mode, i.e. rotation of tripod's rod is impossible without a control signal received. The slave devices are: electromagnet (solenoid) blocking unit **2** (Figure 7), thereby releasing the anchor lock **4** of the revolver **5**.

After rotating tripod's rod to 20°, the electric motor turns on **1**, in the sequence, EM (solenoid) turns "off" automatically at 80°, and brings springs **6** together with interlocking yoke back to the unit's "stand by" position.

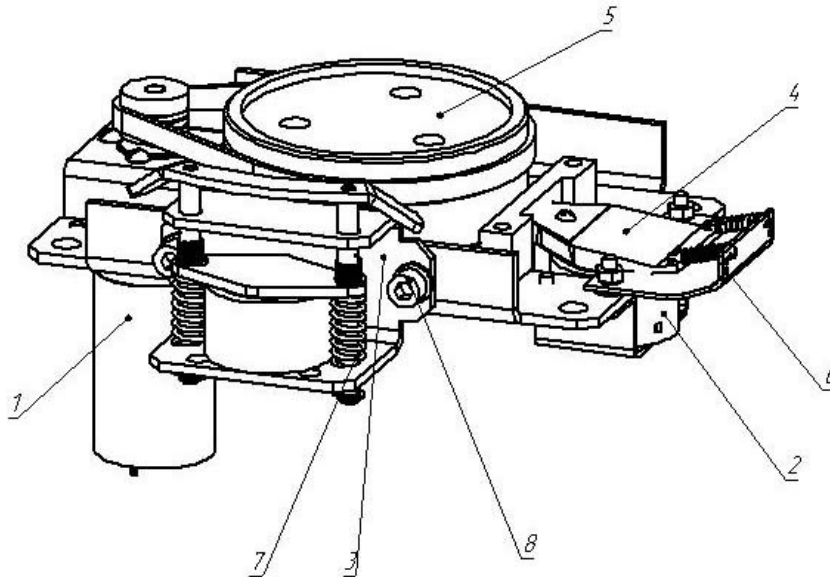


Figure 7 – Electric-driven unit.

4.8 Turnstile's controller

4.8.1 “Dry- Contacts” controller

The Controller is situated right underneath the top cover. (Figure 1).

Controller connection scheme is shown at Figure 8. The following devices are connected to the controller:

- Two electromagnets (solenoids), which correspond to given signals: Block – blocking or unblocking entrance (or exit); Panic – a signal to control the solenoid, which is a part of “anti-panic” unit and holds the rod in its horizontal “stand by” position. The rod takes its “stand by” position **automatically** as soon as “anti-panic” solenoid is turned “on”.
- Sensors of tripod positioning, which transmit DB, DC signals. The tripod positioning is controlled with help of these sensors.
- Light Indication, comprised of two groups. First group (signals Red1 and Green1) indicates the state of an entrance (prohibited or allowed). Second group (Red1 and Green 1) – the state of an exit.
- Light Indication of “running line” type
- Electric Motor (DC).

Controller responds to four signals (formed by remote or ACS): *Entry* (“entry” button) – single pass forward; *Exit* (“exit” button) – single pass back; *Alarm* (“emergency entry” button) – emergency tripod’s rod release (rod drops down); *Function* (“function” button) – this signal brings turnstile back to its original state of operation. When *Function*, *Entry* and *Exit* signals are received simultaneously – it sets turnstile to a “Free Entry/Exit” mode.

Corresponding scheme of control inputs (XP2, contacts 22-25, Fig. 8) is shown on Figure 9.

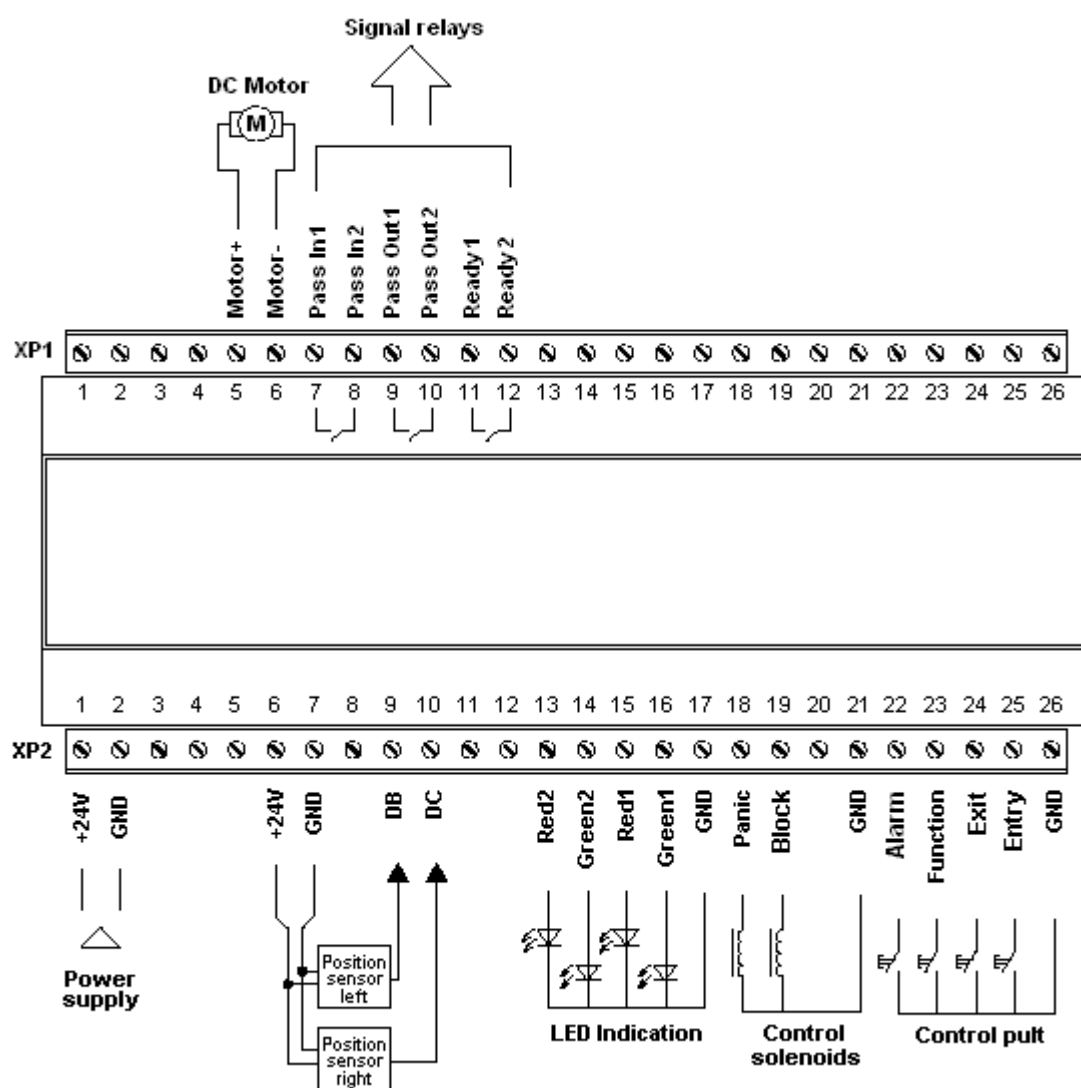


Figure 8 – Turnstile's Controller - Scheme of connections

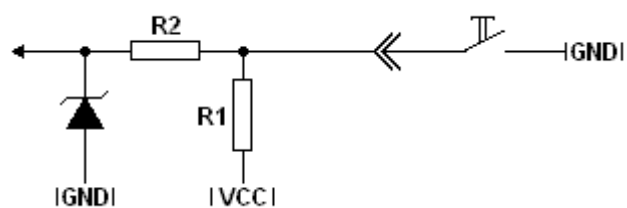


Figure 9 – scheme of controlling input
(for signals Entry, Exit, Function, Alarm)

Turnstile's controller generates the following signals for upper-level ACS (see also Table 1):

- **Pass In** – in their initial state, relay contacts are disengaged (open). If a person commits a pass in the “forward” direction, then turning the rod of a tripod at 20° closes relay contacts. At the completion of passage (when tripod returns to its original position) relay opens again. Thus, single entry in the “forward” direction is confirmed.
- **Pass Out** – in their initial state, relay contacts are disengaged (open). If a person commits a pass in the “back” direction, then turning the rod of a tripod at 20° closes relay contacts. At the completion of passage (when tripod returns to its original position) relay opens again. Thus, single entry in the “back” direction is confirmed.

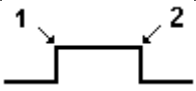
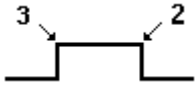
If controller receives Alarm signal, both relay contacts, Pass In and Pass Out, get engaged (closed) simultaneously. After subsequent Alarm signal is received, Pass In and Pass Out relay contacts are getting released.

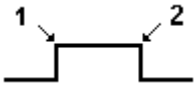
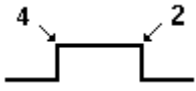
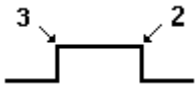
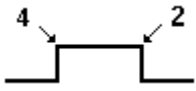
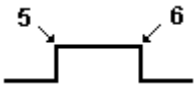
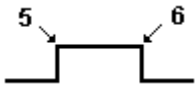
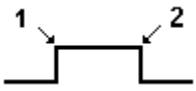
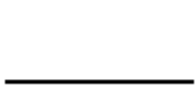
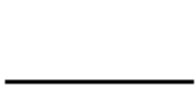
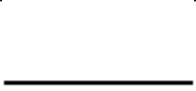
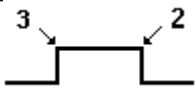
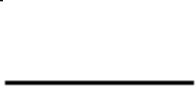
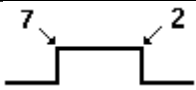
- **Ready** – in their initial state, relay contacts are disengaged (open). Via this signal, the controller informs ACS about: 1) “forward” or “reverse” passage is delayed for more than 20 seconds; 2) tripod is not returned to its original “stand by” position.

In the event of 20-second or more passage delay, the Ready signal forms as follows: if there 20 sec. or longer delay from the beginning of entry (the beginning is defined when tripod is turned at 20° degree or more, i.e. by activation of one of the sensors), and the full turning cycle of a tripod towards the passage direction is not completed and its return back to the original “stand by” position is not registered, the relay contacts get engaged (closed). When tripod returns to its original “stand by” position, relay contacts get disengaged (the ending of Ready and Pass In/Pass Out signals).

There could be a situation, when, for whatever reason, the tripod can not reach the “stand by” position; or someone tries to forcibly turn the tripod. In this event, after 7 seconds delay, the single Ready signal is generated (relay contacts get engaged). After tripod is back to its original “stand by” position, relay contacts get disengaged (Ready signal is dismissed).

Table 1 – Signals, generated for upper-level ACS

Turnstile's Operation Modes	Relay (signal) Pass In	Relay (signal) Pass Out	Relay (signal) Ready
Single Passage Forward			
Single Passage Reversed			

20+ seconds delay, “Forward”			
20+ seconds delay, “Reverse”			
Emergency Entry			
Free Entry, “Forward”			
Free Entry, “Reverse”			
7-second delay, when tripod is back to its “stand by” position			

The raising front of the rectangular impulse stands for engaging of relay contacts for certain event. The dropping end of the rectangular impulse stands for braking relay contacts for certain event.

Signals to the upper-level ACS can be transmitted for the following events:

1. 20° turn of the tripod’s rod when “forward” entry is permitted;
2. Return of the tripod to its original “stand by” position;
3. minus 20° (reverse) turn of the tripod’s rod when “reverse” entry is permitted;
4. The ending of 20-second time delay (waiting time for tripod getting back to its “stand by” original position);
5. Transmission of Alarm signal (turning on the “Emergency Entry” mode);
6. 2nd subsequent transmission of Alarm signal (turning off the “Emergency Entry” mode).
7. Ending of 7-second time delay (waiting for tripod getting back to its original “stand by” mode).

Relay contacts support signal transmission under following parameters:

- Maximum switching voltage, DC 24V;
- Maximum switching amperage 0,5A;
- Closed contact resistanceno more than 0,15 Ohm.

5 INSTALLING AND CONNECTING THE TURNSTILE

5.1 Turnstile installation

The turnstile shall be installed on a firm, flat concrete bases. Securing the turnstile to the floor (see Fig. 11) is carried out by using four anchor bolts (included). When installing turnstile, the following cables should be implemented to the flooring: power sup-

ply, communication cables to the control panel, communication cables to the external ACS controller (or to a personal computer of ACS "Barrier"). The location of the external ACS controller should be at a distance of not more than 20 m from the turnstile.

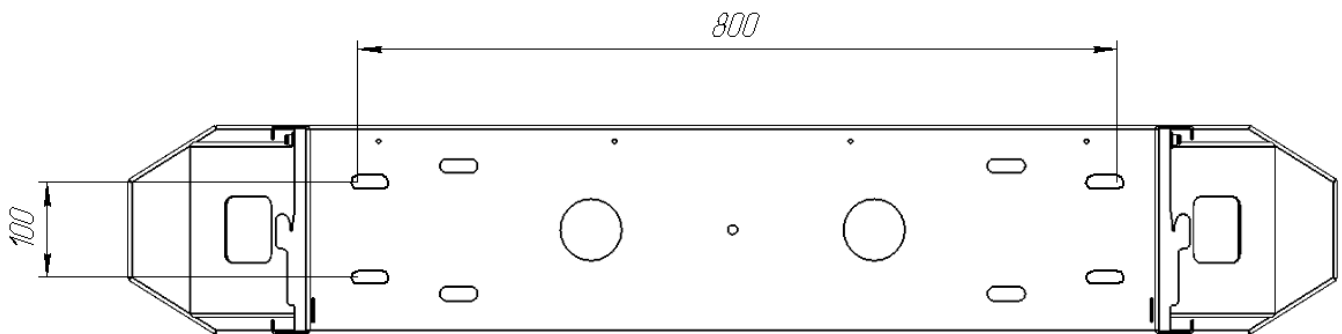


Figure 11 – Mounting turnstile to the base

Installation of the turnstile should be performed in the following sequence:

- Unpack the turnstile. Check if package content is complete.
- Prearrange 4 holes for fixing elements and a slot for the cable laying into the flooring.

- Implement plastic tubes, as well as cables into the floor.

To connect the turnstile, the following cables are necessary:

- Power cable – 2 cables of no less than 1,5mm² in diameter each;
- Remote control cable – 8 cables of no less than 0,22mm² in diameter each (or other cable, which complies with Access Control System requirements)
- Output signals cable for ACS controller – 8 cables of no less than 0,22mm² diameter each (or other cable according to the ACS controller connection scheme).
- Install the turnstile, fix it to the base.
- Install tripod, connecting it to the turnstile.
- Connect all the cables: power, remote control, external ACS controller, as in accordance to Fig. 8 or Fig 10.
- Close and fix by screws top and base covers of the turnstile.

5.2 Pre-operation check up.

Before turning the turnstile “on” it is necessary to visually make sure that all the cables are correctly connected and are not damaged.

Free the turning zone of the turnstile’s tripod from any foreign or obstructive objects.

Connect the main power cable to the electric outlet of 220 V/50Hz.

For removing static electricity from turnstile’s hosing it is recommended to connect it to a “ground” circuit.

After the power is turned “on”, the turnstile’s tripod makes full circle, its rod gets fixed at the horizontal position and turnstiles enters its “stand by” operational mode.

5.3 Operation modes with use of a controller connected via dry contacts

After the power is turned “on”, the turnstile’s tripod makes full turn, its rod gets fixed at the horizontal position and turnstiles enters its “stand by” operational mode.

By sending signals of a lower-level (GND) with time-frame of no less than 40ms to the 22-25 contacts of XP2 connector (Fig. 6), the following modes of turnstile’s operation can be formed:

Original state of the turnstile – is formed by transmitting a Function signal from ACS (or by briefly pressed “Function” button), while other controlling signals are not active (or remote control buttons are not pressed). This command blocks the entrance in both directions. The Entry and Exit light indication turns Red.

Single passage forward – is formed by transmitting an Entry signal from ACS (or by briefly pressed “Entry” button), while other controlling signals are not active (or remote control buttons are not pressed).

In this mode, the entrance is open for a single person moving forward. Turnstile awaits the beginning of an entry (rotation of tripod’s rod for at least 20° forward) for 7 seconds. If this does not happen, the light indication turns red and the entrance gets blocked. If the entry has begun but has not been completed within 20 seconds, the light indication, again, turns Red, the entrance gets blocked. Additionally, the Ready signal is transmitted to the upper-level (since the Pass signal has been already sent) and the turnstile waits for the tripod to get back to its original “stand by” position (see Table 1). In the event of normally completed entry (without delays), the upper-level receives only the Pass In signal. Then, light indication turns Red and the entrance gets blocked.

Exiting from this mode is possible as follows:

1) By transmitting a Function signal (pressing the “Function” button) and re-turning turnstile to its original state;

2) By transmitting Alarm signal and entering the “Emergency entry” mode.

Entry signal is ignored, if:

1) turnstile is in the “**Free entry**” mode;

2) turnstile is already in the “**Single passage forward**” mode;

3) tripod of the turnstile is not in its original “**stand by**” position;

4) turnstile is in the “**Emergency entry**” mode.

Single passage reversed – is formed by transmitting an Exit signal from ACS (or by briefly pressed “Exit” button), while other controlling signals are not active (or remote control buttons are not pressed).

In this mode, the passage is open for a single person moving in reverse direction. Turnstile awaits the beginning of a passage (rotation of tripod’s rod for at least minus 20° - i.e. backward) for 7 seconds. If this does not happen, the light indication turns red and the entrance gets blocked. If the passage has begun but has not been completed within 20 seconds, the light indication, again, turns Red, the entrance gets blocked. Additionally, the Ready signal is transmitted to the upper-level (since the Pass signal has been already sent) and the turnstile waits for the tripod to get back to its original “stand by” position (see Table 1). In the event of normally completed entry (without delays), the upper-level receives only the Pass In signal. Then, light indication turns Red and the exit gets blocked.

Exiting from this mode is possible as follows:

- 1) By transmitting a Function signal (pressing the “Function” button) and returning turnstile to its original state;
- 2) By transmitting Alarm signal and entering the “Emergency entry” mode.

Entry signal is ignored, if:

- 1) turnstile is in the “**Free exit**” mode;
- 2) turnstile is already in the “**Single passage reversed**” mode;
- 3) tripod of the turnstile is not in its original “**stand by**” position;
- 4) turnstile is in the “**Emergency entry**” mode.

Emergency entry – is formed by transmitting an Alarm signal from ACS (or by briefly pressed “Emergency entry” button), while other controlling signals are not active (or remote control buttons are not pressed).

In this mode, the solenoid of “anti-panic” module turns off and tripod’s rod drops down automatically. In the same time, signals Pass In and Pass Out are transmitted to the upper-level and light indication turns green. The free passage through the turnstile is granted in both directions. This command is used in case of emergency or hazardous to people’s lives situations.

After receiving a subsequent Alarm signal the Pass In and Pass Out signals are dismissed, turnstile’s tripod makes full circle, the rod takes its horizontal position, and turnstile is back to its normal original state of operation.

When turnstile is in the Emergency mode, the Entry, Exit and Function signals are ignored.

Free Entry – is formed by transmitting Entry and Function signals simultaneously from ACS (or by briefly pressed “Entry” and “Function” buttons), while other controlling signals are not active (or remote control buttons are not pressed).

In this mode, the passage in forward direction is granted for any number of visitors. The Pass In signal is transmitted to the upper-level after each entry.

It is possible to exit from this mode by:

1) transmitting a Function signal (by pressing “Function” button) and returning turnstile to its original state;

2) transmitting an Alarm signal and entering to the “Emergency entry” mode.

When turnstile is in “Free Entry” mode the Entry signal is ignored.

Free Exit – is formed by transmitting Exit and Function signals simultaneously from ACS (or by briefly pressed “Exit” and “Function” buttons), while other controlling signals are not active (or remote control buttons are not pressed).

In this mode, the passage is granted towards reverse direction for any number of visitors. The Pass Out signal is transmitted to the upper-level after each single passage.

It is possible to exit from this mode by:

1) transmitting a Function signal (by pressing “Function” button) and returning turnstile to its original state;

2) transmitting an Alarm signal and entering to the “Emergency entry” mode.

When turnstile is in “Free Exit” mode the Exit signal is ignored.

Combined “Free Entry and Exit” – is formed by transmitting Entry, Exit and Function signals simultaneously from ACS (or by briefly pressed “Entry”, “Exit” and “Function” buttons), while other controlling signals are not active (or remote control buttons are not pressed).

In this mode, the passage is granted towards both, forward and reverse direction for any number of visitors. The Pass In and Pass Out signals are transmitted to the upper-level after each entry or exit passage.

It is possible to exit from this mode by:

1) transmitting a Function signal (by pressing “Function” button) and returning turnstile to its original state;

2) transmitting an Alarm signal and entering to the “Emergency entry” mode.

When turnstile is in “Free Entry and Exit” mode the Entry and Exit signals are ignored.

5 . 4 Setting up operation modes

“Single passage forward” mode

1) transmit Entry signal;

2) 40 ms of delay or longer;

3) dismiss Entry signal;

4) 40 ms of delay or longer.

“Single passage reversed” mode

1) transmit Exit signal;

2) 40 ms of delay or longer;

3) dismiss Exit signal;

4) 40 ms of delay or longer.

“Emergency entry” mode

- 1) transmit Alarm signal;
- 2) 40 ms of delay or longer;
- 3) dismiss Alarm signal;
- 4) 40 ms of delay or longer.

“Turnstile’s original state” mode

- 1) transmit Function signal;
- 2) 40 ms of delay or longer;
- 3) dismiss Function signal;
- 4) 40 ms of delay or longer;

“Free Entry” mode

- 1) transmit Entry signal;
- 2) 40 ms of delay or longer;
- 3) transmit Function signal;
- 4) 40 ms of delay or longer;
- 5) dismiss Function and Entry signals;
- 6) 40 ms of delay or longer.

“Free Exit” mode

- 1) transmit Exit signal;
- 2) 40 ms of delay or longer;
- 3) transmit Function signal;
- 4) 40 ms delay or longer;
- 5) dismiss Function and Exit signals;
- 6) 40 ms of delay or longer.

“Free Entry and Exit” combined mode

Variant 1:

- 1) transmit Exit signal;
- 2) 40 ms of delay or longer;
- 3) transmit Entry signal;
- 4) 40 ms of delay or longer;
- 5) transmit Function signal;
- 6) 40 ms of delay or longer;
- 7) dismiss Function, Entry and Exit signals;
- 8) 40 ms of delay or longer.

Variant 2:

- 1) transmit Entry signal;
- 2) 40 ms of delay or longer;
- 3) transmit Exit signal;
- 4) 40 ms of delay or longer;
- 5) transmit Function signal;
- 6) 40 ms of delay or longer;
- 7) dismiss Function, Entry and Exit signals;
- 8) 40 ms of delay or longer.

5.5 Turnstile's modes of operation with controller under the protocol.

Modes of operation with controller under the protocol are described in the "Barrier" ACS protocol overview.

6 MAINTANANCE AND SERVICE

Maintenance of the turnstile is conducted to ensure trouble-free performance of the unit throughout its lifetime of operation.

When performing maintenance the safety requirements must be respected, as listed in the Section 3 of this manual.

Recommended procedures and intervals of technical maintenance (TM) are shown in Table 2.

Table 2 – procedures and intervals of TM.

Procedures	Time intervals	Estimated laboriousness, hrs
TM-1	Every 3 months	0,5
TM-2	Every 6 months	1

The technical services of TM-1 include the following:

- visual inspection for external damages;
- visual inspection of the network connection and power cabling;
- dust and dirt removal from the outer and inner parts of the turnstile's body and mechanism;
- cleaning of the controlling module's electric circuit board: the surface of the board should be cleaned from dust and dirt with a soft brush, then wiped with a soft cloth, slightly moistened with an alcohol.
- Scanning turnstile modes in accordance to the tables of this manual.

The technical services of TM-2 include the following:

- TM-1 procedures;
- Inspection of mounting assemblies, cables and components of turnstile;

- Inspection of reliability of threaded connection tightening (turnstile casing, mechanism, etc.)

7 TROUBLESHOOTING

7.1 Controller diagnostics

LEDs (Fig. 12) readout legends are given in Table 3.

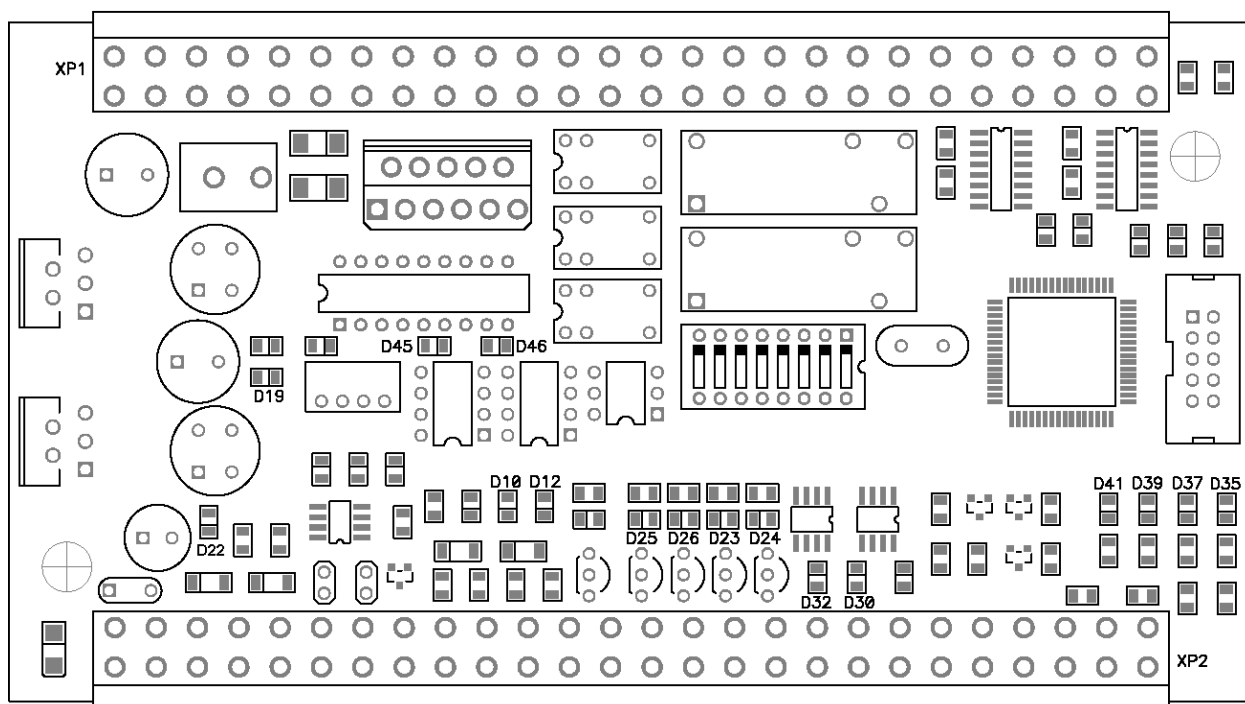


Figure 12 – Turnstile’s controller, operated via dry contacts

Table 3 – LEDs readouts

LED symbol	Readout designation
D10	Indicates the DB signal transmission from the tripod position sensor. If LED is lit – the DB signal is present.
D12	Indicates the DC signal transmission from the tripod position sensor. If LED is lit – the DC signal is present.
D19	Indicates the presence of voltage to microprocessor (5V). If LED is lit – the 5V power is present.
D22	Indicates the presence of 24V input voltage. If LED is lit – the 24V voltage is present.
D23	Indicates the Red1 signal transmission (light indication at the entrance, red light). If LED is lit – the Red1 signal is present. This signal turns the “Red” indicator for entrance.
D24	Indicates the Green1 signal transmission (light indication at the

	entrance, green light). If LED is lit – the Green1 signal is present. This signal turns “Green” indicator for entrance.
D25	Indicates the Red2 signal transmission (light indication at the entrance, red light). If LED is lit – the Red2 signal is present. This signal turns the “Red” indicator for exit.
D26	Indicates the Green2 signal transmission (light indication at the entrance, green light). If LED is lit – the Green2 signal is present. This signal turns “Green” indicator for exit.
D30	Indicates transmission of Block signal. If LED is lit – the Block signal is present. This signal turns off the solenoid, which is responsible for blocking (opening) the entrance.
D32	Indicates the transmission of Panic signal. If LED is lit – the Panic signal is present. This signal turns on the “Anti-panic” solenoid and the rod, after completing full turn, should get fixed at the horizontal position.
D35	Indicates the transmission of Entry signal by ACS (or by pressed Entry button). If LED is lit – the Entry signal is present (or button is pressed).
D37	Indicates the transmission of Exit signal by ACS (or by pressed Exit button). If LED is lit – the Exit signal is present (or button is pressed).
D39	Indicates the transmission of Function signal by ACS (or by pressed Function button). If LED is lit – the Function signal is present (or button is pressed).
D41	Indicates the transmission of Alarm signal by ACS (or by pressed Alarm button). If LED is lit – the Alarm signal is present (or button is pressed).
D45	Indicates transmission of the counterclockwise rotation signal to the electric motor control circuit board. If there is no signal – the LED is lit. If LED is blinking (at 1kHz frequency) – the signal is present.
D46	Indicates transmission of the clockwise rotation signal to the electric motor control circuit board. If there is no signal – the LED is lit. If LED is blinking (at 1kHz frequency) – the signal is present.

When 24V is supplied to turnstile’s controller, the tripod makes a complete turn, the rod gets fixed in the horizontal position and turnstile is brought to its original state, which should be reflected by lit ups of the following LEDs: D10, D12, D19, D22, D23, D25, D32, D45, D46.

7.2 Most likely problems and methods of their elimination

The list of most likely problems of the turnstile’s controller and steps to correct them are shown in Table 4.

Table 4 – list of most likely problems and methods of their elimination

Problem	Cause	Method of elimination
Turnstile is not functioning when turned on. No LED signal lights on the controller	1. The Power cable is faulty. 2. Power cable is improperly connected (“+” and “-” are flipped)	Check for proper connection. Check the power cord.
Light indication does not switch to Green at turnstile’s entrance when Entry signal is transmitted (“Entry” button is pressed). Turnstile does not allow passage forward.	1. The “Entry” button is faulty. 2. The connection cable between remote control and turnstile’s controller is faulty. 3. Tripod is not in its original “stand by” position. 4. Sensor of tripod’s position is faulty.	Check if D10 and D12 LEDs are lit. If one of them is not lit, bring the tripod to its original “stand by” position or check sensors of tripod positioning. If D10 and D12 are lit but turnstile does not react to pressed “Entry” button – check if D35 gets lit at the moment the button is pressed. If D35 does not light up – check the connection between remote and turnstile’s controller.
The entrance light indication switches to Green when Entry signal is transmitted (“Entry” button is pressed), but turnstile still does not open passage in forward direction.	1. The solenoid, which opens passage in the direction forward, is faulty. 2. The connection cable between mechanism and the controller is faulty.	Check if D30 LED gets lit after Entry signal is transmitted (“Entry” button is pressed). If yes, check the connection between mechanism and controller, as well as solenoid, which opens passage in forward direction.
The light indication does not switch to Green, and turnstile does not open passage in reverse direction, while Exit signal is transmitted (“Exit” button is pressed).	1. The “Exit” button is faulty. 2. The connection cable between remote and turnstile’s controller is faulty. 3. Turnstile’s tripod is not in its original “stand by” position. 4. Sensor of tripod	Check if D10 and D12 LEDs are lit. If one of them is not lit, bring the tripod to its original “stand by” position or check sensors of tripod positioning. If D10 and D12 are lit but turnstile still does not react to pressed “Exit” button – check if D37 lights up at the moment the button is pressed. If D37 does not light up – check the connection between re-

	positioning is faulty.	mote and turnstile's controller.
The exit light indication switches to Green when Exit signal is transmitted ("Exit" button is pressed), but turnstile still does not open passage in reverse direction.	1. The solenoid, which opens passage in the reverse direction, is faulty. 2. The connection cable between mechanism and the controller is faulty.	Check if D30 LED gets lit after Exit signal is transmitted ("Exit" button is pressed). If yes, check the connection between mechanism and controller, as well as solenoid, which opens passage in forward direction.
Turnstile does not enter the Free Entrance mode when Function and Entry (or Exit) signals are pressed simultaneously.	1. The "Function" or "Entry" (or "Exit") buttons are faulty. 2. The connection cable between remote control and turnstile's controller is faulty.	Check if D35 and D39 (D37 and D39) LEDs light up when "Function" and "Entry ("Function" and "Exit") buttons are pressed simultaneously. If any of LEDs is not getting lit (or both) – check the connection cable between remote control and turnstile's controller.
Turnstile does not turn on Green passage indication lights and does not drop down tripod's rod when Alarm signal is transmitted ("Emergency Entry" button is pressed).	1. "Emergency Entry" button is faulty. 2. The connection cable between remote control and turnstile's controller is faulty.	Проверить загорается ли светодиод D41 в момент нажатия кнопки "Аварийный проход". Если D41 не загорается, то проверить соединение пульта и контроллера турникета. Check if D41 LED lights up when "Emergency Entry" button is pressed. If not – check the connection cable between remote control and turnstile's controller.
When Alarm signal is transmitted ("Emergency Entry" button is pressed), the turnstile turns on Green light indication, but tripod does not drop the rod.	1. The solenoid of "Anti-panic" module is faulty. 2. The connection cable between mechanism and the controller is faulty.	See if D32 LED went off after "Emergency Entry" button was pressed. If D32 went off – check if "Anti-panic" module is working properly.
The rod of a tripod does not return to its original "stand by" position after 2 nd Alarm signal is transmitted ("Emergency Entry" button is pressed).	The "Anti-panic" module is faulty.	See if D32 LED is lit. If yes – wait until tripod completes the turn, then drop its rod all the way down, and then bring it all the way up. If, after this procedure, the rod still does not get fixed at the horizontal position it is necessary to replace "Anti-panic" module, tripod, all the whole mechanism.

