Electromechanical Tripod Turnstile

PERCo®

TTR-04CW-24

Assembly and Operation Manual

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CE

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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.

The assembly and operation manual (hereinafter - the Manual) for the **TTR-04CW-24** electromechanical tripod turnstile (hereinafter - the turnstile) contains data that is necessary for the most full 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;
- SPS — standby power supply;
- CU — control unit;
- RC panel — remote control panel.

1. APPLICATION

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

To ensure fast and convenient passage it is recommended to install one turnstile per 500 people working the same shift or on the basis of maximum working load 30 persons/min.

2. OPERATION CONDITIONS

2.1. The **T-04W-24** turnstile housing (hereinafter – **the turnstile housing**) with regard to resistance to environmental exposure complies with GOST 15150, category U2 (for an outdoor sheltered application or in premises without climate control). This is ensured by additional corrosion-resistant zinc coating of the housing and by the built-in heating system with thermocontrol. The barrier arms are made of stainless steel as standard.

Operation of the turnstile housing is allowed at ambient air temperature from -40 to + 40 °C and at relative air humidity of up to 75% at + 15 °C.

2.2. The CU-02N control unit (hereinafter – the control unit) with regard to resistance to environmental exposure complies with GOST 15150, category NF 4 (operation in premises with climate control).

Operation of the control unit is allowed at ambient air temperature from + 1°C to + 40 °C and at relative air humidity of up to 60% at + 20 °C.

2.3. The remote control panel (hereinafter – the RC panel) with regard to resistance to environmental exposure complies with GOST 15150, category NF 4 (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 60% at + 20 °C.

3. TECHNICAL SPECIFICATIONS

Power supply .....220±22V AC / 50±1Hz
Turnstile power consumption (without heating system with thermocontrol) ..max. 20W
Turnstile operating voltage from external power supply..... 12±1,2V DC
Turnstile power consumption from external power supply .....max. 15W
Operating voltage of the heating system with thermocontrol ..... 24±2,4V AC
Power consumption of the heating system with thermocontrol.....max. 60W
Turnstile housing overall dimensions (L x W x H).....280x260x1050 mm
Control unit overall dimensions (L x W x H)..... 270x190x60 mm
Passageway width .....600 mm
Barrier arm rotation force .....max. 3,5 kgf
Turnstile housing control cable *) ..... 3,0 m
Power cable of the heating system with thermocontrol **)..... 3,0 m
Control unit power cable ..... 1,5 m
RC panel cable***) ..... 3,0 m
Turnstile housing in assembly, net weight.....max 37 kg
Control unit, net weight .....max 3,8 kg
Throughput rate in a free passage mode..... 60 persons/min
Throughput rate in a single passage mode..... 30 persons/min
Mean time to failure .....no less than 1,500,000 passages
Mean lifetime .....no less than 8 years
Electric shock protection class:
Control unit .....I according to GOST R IEC 335-1-94
Turnstile housing .....III according to GOST R IEC 335-1-94
Ingress Protection Rating:
Control unit .....IP40 under EN 60525
Turnstile housing .....IP42 under EN 60525

Important Note. The CU-02N power supply can be effected either from the AC mains 220V/50Hz or from an external DC power supply 12V via the CU “Bat=12V” connector. External power supply unit 12V DC is not included in the standard deliver set and is customer supply. Power supply unit specifications: 12±1,2V DC, minimum 1,2A.

4. STANDARD DELIVERY SET

Turnstile housing with control cable and power cable of the heating system with thermocontrol 1
RC panel with cable..... 1
Barrier arm 3
Mechanical release key..... 2
Package 1
Control unit with a battery 1.2Ah, 12V 1
4x20 screw 3
Plastic dowel 3
Plug..... 4

*) MPS 14x0.2 mm^2. MAX allowed cable length – 40m.
**) MPS: 2x0.75 mm^2. MIN requirements for cables over 10m - 2x 1.5 mm^2; MAX allowed cable length – 40m
***) MPS 8x0.12 mm^2. MAX allowed cable length – 40m.
CAUTION: Using of cables more than 40 m long may result in interferences in a control line.
Requirements to temperature properties of cable insulation depend on operation temperature conditions at a place of installation.

Certificate 1
Assembly & Operation Manual 1

Spare parts:

Plug 1
Stop spring 2

Fuses:

VP1-1-250-0.5A 2
VP1-1-250-2A 1

ACS connector:

DBH-15F cable socket 1
H9 connector case 1

External power supply unit connector:

DC2,1/5,5/9,5 mm 1
Jumper for the J3 connector 1

5. OPTIONAL EQUIPMENT SUPPLIED ON REQUEST:

Power supply unit for the heating system with thermocontrol 1
Wireless remote control kit (a receiver and 2 transmitters (tags) with operation range up to 40 m) 1

6. PRODUCT DESCRIPTION

6.1. Main features

6.1.1. The turnstile can be operated from the remote control panel or by a wireless remote control, as well as from an access control system (ACS).

6.1.2. The turnstile housing is supplied with a safe voltage — no more than 14V, with the heating system with thermocontrol in operation — no more than 40V.

6.1.3. The turnstile has low power consumption — maximum 20W, with the heating system with thermocontrol in operation – maximum 80W total.

6.1.4. The standby power supply (the SPS) built into the control unit is provided with a lead-acid backup battery to maintain proper operation of the turnstile for 4 hours or 1000 passages in case of the power failure. Once the main power is restored, the battery automatically starts being recharged.

6.1.5. The turnstile retains the set position for each direction when the power supply voltage is removed — an open passage direction remains open, a closed passage direction remains closed.

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

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

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

6.1.9. The mechanical release lock built into the turnstile housing ensures the turnstile unlocking with a key in emergency cases (free rotation of barrier arms).

6.2. Design

The design of the turnstile is shown in Fig. 1.

6.2.1. The turnstile housing (1) is a welded metal structure with a cover (12). In an upper part of the turnstile housing there is a rotation mechanism (14) with three barrier arms (2), a locking device, a self-centering mechanism and arm rotation sensors. A LED indication display is located on the front panel of the cover (12). The turnstile housing is equipped with the heating system with thermocontrol.

6.2.2. The large LED indication display with bright pictograms is intended for status and direction indication: a Green Arrow indicates the direction of an authorised passage (the turnstile is open in the set direction); a Red Cross indicates ban on passage (the turnstile is locked).

In the left-hand bottom corner of the LED indication display of the turnstile housing there is an additional LED indicating operating modes of the built-in heating system with thermocontrol. The LED is green when the heating system with thermocontrol is powered up, and it is amber when the heater is in operation.

6.2.3. The turnstile housing (1), the control unit (3) and the remote control panel (4) are connected with cables (6, 7).

6.2.4. The remote control panel (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 is connected to the control unit (the CU) with a multicore flexible cable (6) via the «RC» connector (Fig. 2).

There are three control buttons on the RC front panel, which are intended for setting the turnstile operating modes. Above the buttons there are LED indicators. The button in the middle (hereinafter — the **STOP** button) is intended to set the turnstile to the “Always locked” mode. The left and the right buttons are intended to unlock the turnstile for passage in the chosen direction.

If the turnstile housing installation is not standard (e.g. the operator’s terminal is placed at the backside of the turnstile housing and not at the front side), the RC panel orientation towards the turnstile housing can be changed by switching the RC panel over to the “Wireless” connector of the CU (Fig. 2.).

The RC panel is equipped with a buzzer for audio signal generation. Button push signals from the RC panel are transmitted to the CU.

6.2.5. The CU (Fig.1 and Fig.2) comes as a separate device in a metal case with pull-resistant fasteners for wall mounting or desk-mounting.

The CU contains power transformer, control board and 12V standby power supply battery (SPS battery).

WARNING! To avoid accidental power-up of the SPS during storage or transportation, a «Bat/2A» fuse is not installed and is provided together with a set of spare parts.

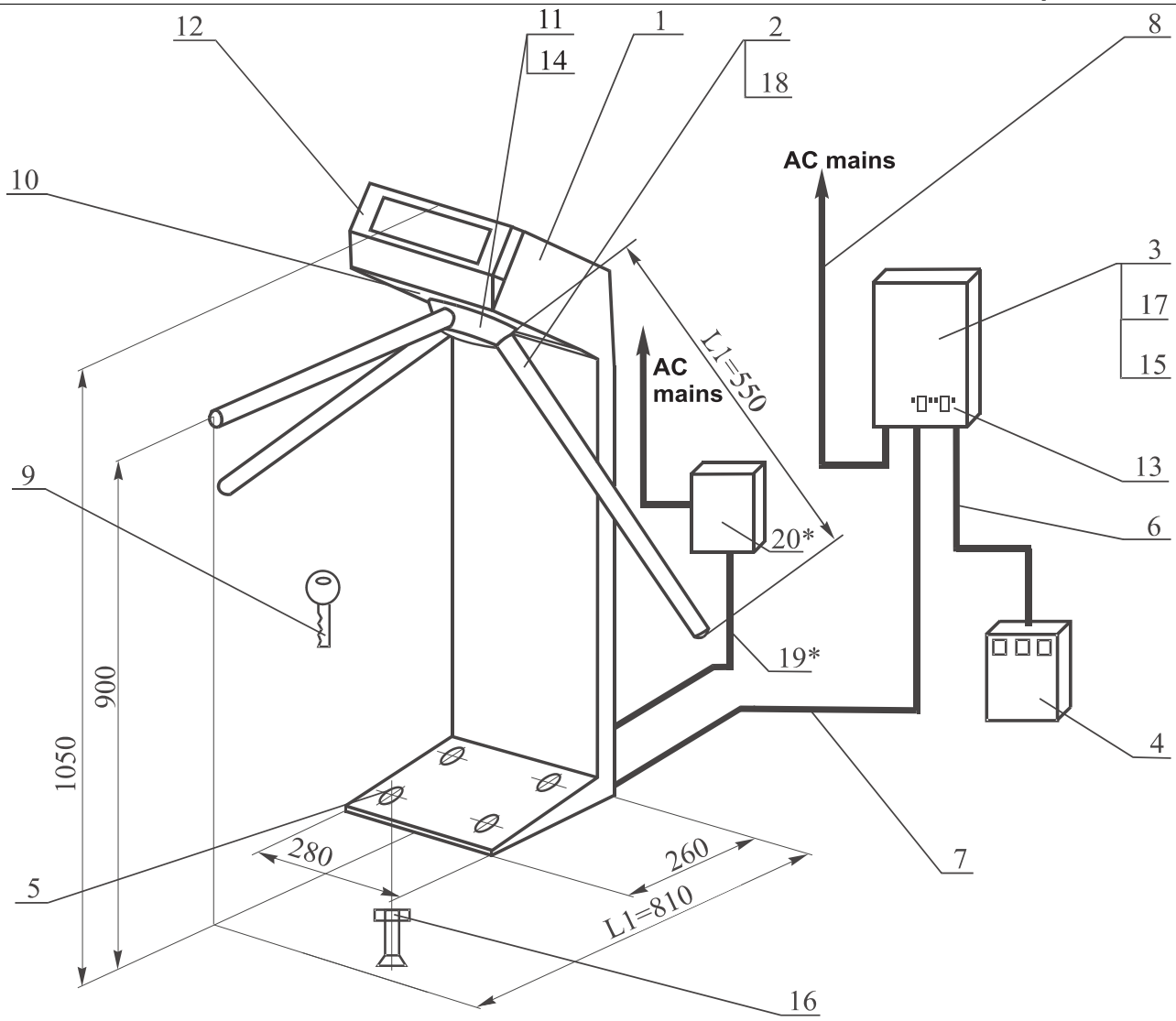


Fig. 1 TTR-04CW-24 overall view

1 — turnstile housing; 2 — barrier arm; 3 — control unit; 4 — RC panel; 5 —plug; 6 — RC cable; 7 — turnstile housing cable; 8 — AC power cable; 9 — mechanical release key; 10 — lock; 11 — hub; 12 — cover with LED indication display; 13 — CU indicator; 14 — rotation mechanism; 15 — dowel; 16 —anchor bolt M10x70; 17 —screw 4x20; 18 — fasteners for barrier arms; 19 —power supply cable of the heating system with thermocontrol; 20 —power supply unit of the heating system with thermocontrol.

The CU front panel has the following LED indicators (Fig. 2):

- **«Power»** — AC mains on green;
- **«12V»** — 12V DC power supply, green;
- **«Battery»** — the CU changeover to the SPS and indication of the SPS battery discharge, red;

CU front panel also houses:

- Power **«ON» / «OFF»** toggle switch — AC mains switching ON/OFF;
- Battery **«Internal»/«External»** toggle switch— connection of the internal SPS or external DC power supply.

The CU lower panel contains:

- 3 fuse slots with fuses installed (0.5A — 2 pcs., 2A — 1 pc.);
- AC power input cable connector — **«Power»**;
- RC panel connector — **«RC»**;
- connector for access control system — **«ACS»**;
- turnstile housing connector — **«Control»**;
- external power supply connector — **«Bat=12V»**;
- wireless control connector — **«Wireless»**.

6.3. Control over turnstile

The turnstile can be operated:

- from the RC panel;
- from an ACS.

For connection layout please refer to Fig.9.

6.3.1. Control with the remote control panel

The following operating modes can be set from the RC panel (see Table 1):

1. Always locked;
2. Single passage in the set direction;
3. Bi-directional single passage;
4. Free passage in the set direction;
5. Free passage in one direction, single passage in the opposite direction;
6. Always free.

6.3.2. Operation from an ACS via the CU «ACS» connector

ACS is connected to the CU «ACS» connector with a cable. The turnstile control is effected in a pulse mode (similar to the one via the RC panel).

The «ACS» connector pins assignment is shown in Fig. 3.

The turnstile is operated from the CU **«ACS»** connector by closing the contacts **«RIGHT»**, **«STOP»**, **«LEFT»** and **«GND»** (GROUND) or by input of a low-level signal.

As the control element in the ACS there can be used a normally open relay contact or a circuit with open collector output and the following signal features:

- permanent or impulse low-level signals with duration no less than 100ms;
- the voltage at open contact — 5±0.5V;
- the voltage at closed low-level contact — no more than 0.8V;
- the current via closed contact — no more than 1.5mA

The arm rotation sensors, placed inside the turnstile housing, track passages through the turnstile. A passage direction is determined according to sequence of sensors actuation.
The signals are generated at the contacts «**Sens R/Pass R»** and **«Sens L/Pass L»** of the CU **«ACS»** connector at each passage when turning the barrier arms.
The signal duration depends on the rotation speed of the barrier arms.

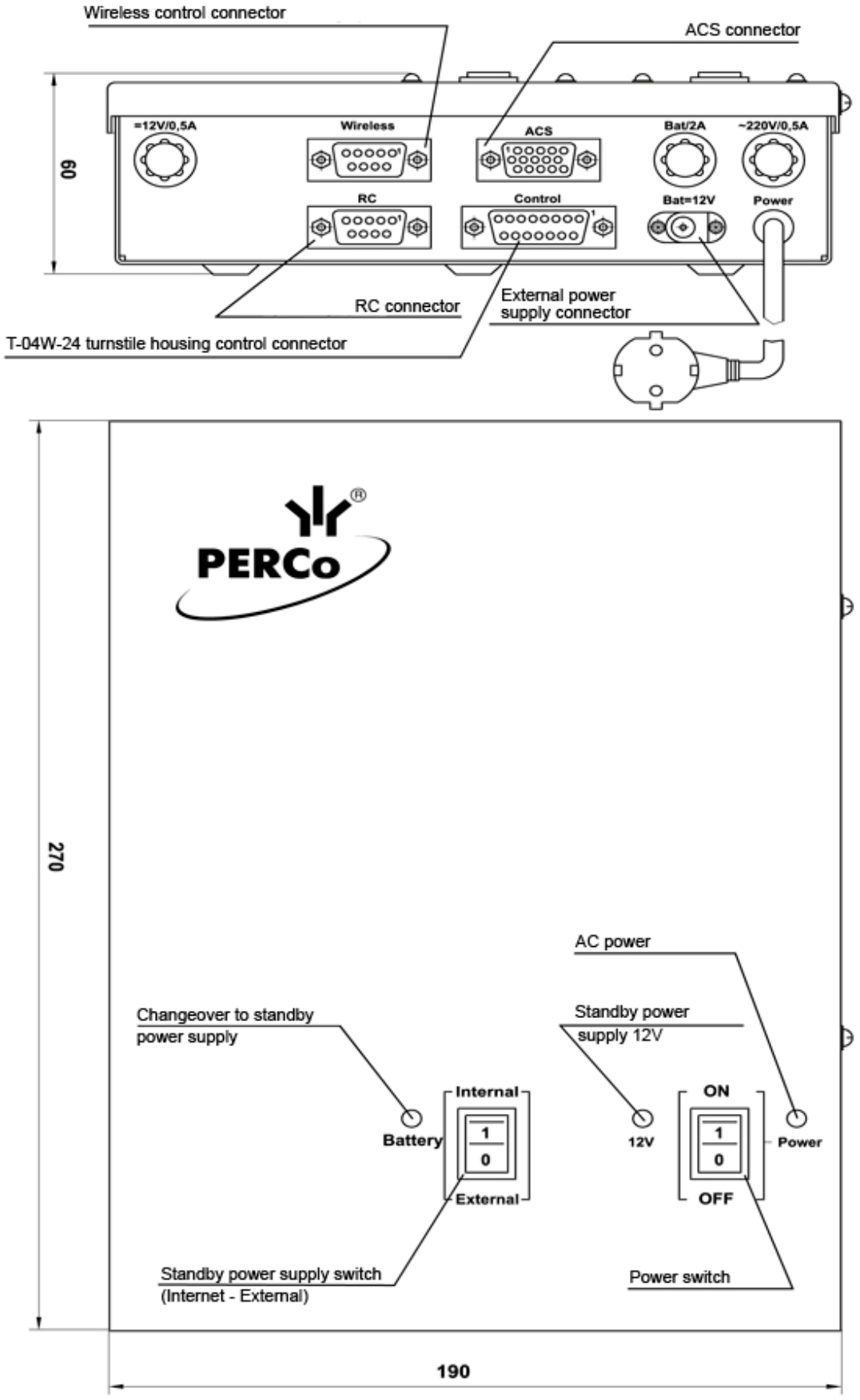


Fig. 2 Control unit

There can be 2 variants of signals generation:

Variant 1: The high-level signal is transmitted to the «Sens R/Pass R» contacts at passage in one direction (the signal begins at the moment arms are turned 67° and ends at the moment the arms are back in their home position), and to the **«Sens L/Pass L»** — at passage in the opposite direction.

Variant 2: Information on state of rotation sensors is transmitted to the **«Sens R/Pass R»** and **«Sens L/Pass L»** contacts. At passage, turning the hub (11 in Fig.1) at 120°, the following pattern is formed:

- turning at approximately 8° — a high-level signal at **«Sens R/Pass R»** (the transistor is closed);
- turning at approximately 53° — a high-level signal at **«Sens L/Pass L»** (the transistor is closed);
- turning at approximately 67° — a low-level signal at **«Sens R/Pass R»** (the transistor is open);
- turning at approximately 112° — a low-level signal at **«Sens L/Pass L»** (the transistor is open).

The pattern at the **«Sens R/Pass R»** and **«Sens L/Pass L»** contacts is changed at passage in the opposite direction.

NOTE. The variant of signal generation is set by the jumper on the J3 connector (for the J3 connector location see label inside the control unit): the jumper is not installed — variant 1, the jumper is installed — variant 2.

At delivery the jumper is not installed. The jumper is supplied with a set of spare parts.

The CU output cascades are the circuit with open collector output with the following signal characteristics:

- the maximum voltage — no more than 25V;
- the maximum current — no more than 50mA.

In the initial position the transistors are open (a low-level signal).

There are several additional signals put out at the CU «ACS» connector:
«Pwr failure» — AC mains failure (the open collector, an active high-level signal);
«Pass Sensor» — state of additional infrared sensor of an intrusion detector, if applied (the open collector, an active high-level signal);
«Bat failure» — the SPS failure (the open collector, an active high-level signal);
«Plug-in» — the signal informing ACS that the system connector is switched on (a low-level signal);

«Auto/SYS» — the signal level of this contact determines the way of setting the passage waiting time (the signal data is the same as for the **«RIGHT»**, **«STOP»** and **«LEFT»** contacts):

- when the **«Auto/SYS»** contact is not connected — the passage waiting time is equal to 5 seconds (it is determined by the CU internal program setting);
- when the low-level voltage is supplied to the contact — the passage waiting time is infinite. The turnstile will lock either by a **«STOP»** signal from an ACS or after the passage has been effected (turn of barrier arms).

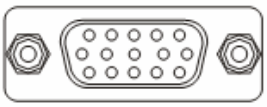
The signal to **«Auto/SYS»** contact must be transmitted prior to the CU power-up.

To set the passage waiting time from an ACS it is recommended to install a jumper at the ACS cable header between contacts 5 and 13.

«Ground» — the contact connected to the ground connection clip on the CU.

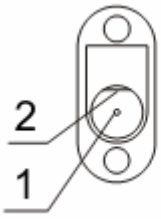
Connector pin assignments for CU

ACS



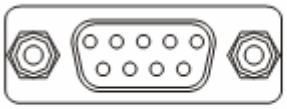
RIGHT	1
STOP	2
LEFT	3
GND	5
SENS L /PASS L	6
SENS R /PASS R	7
Pwr failure	8
Plug-in	10
Pass Sensor	11
Bat failure	12
Auto/SYS	13
Ground	15

External power supply



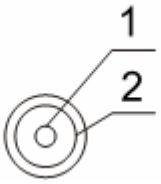
+12V	1
GND	2

RS-232



RxD	2
TxD	3
GND	5

Serena



ALARM	1
+12 V	2

Fig. 3 Control unit connectors

6.4. Unlocking of the turnstile with a mechanical release key

The key (9) of the mechanical lock (10) is intended for unlocking of the turnstile in case of emergency or power failure (at the AC mains switching off and at complete discharge of the built-in SPS battery).

To unlock the turnstile it is necessary to insert the key (9) into the lock (10), turn it 90º clockwise and then take out.

You can turn the barrier arms freely in both directions after this.

To block the barrier arms: one of the barrier arms has to take blocking position, after this turn the key (9) of the lock (10) contra clockwise and take it out of the lock (10).

7. MARKING AND PACKAGING

The turnstile has the following marking:

- on the turnstile housing — a label located inside on the side of the turnstile housing (to get access to the above label unscrew the fixture bolt close to the lock (10) with a socket wrench S10 and carefully lift the cover up with the LED indication display (12)).
- on the CU — a label located on the back panel of the control unit.

The complete delivery set of the turnstile (see Chapter 2) is packed in a transportation box to keep it undamaged during transportation and storage.

8. SAFETY REQUIREMENTS

8.1. Installation safety requirements

- The installation should be carried out only by qualified personnel who has taken safety training and has carefully studied this Manual.
- Use only the serviceable tools for installation.
- All the connectors should be connected up when the CU is switched off from the AC mains.
- It is prohibited to mount the control unit on the current-conducting surfaces or install it in wet premises.
- Observe general electrical safety rules when laying out the cables.

8.2. Operation safety requirements

- Observe general electrical safety rules when operating the turnstile.
- Do not use the turnstile under conditions that do not comply with the requirements of Chapter 2 of this Manual.
- Do not open the CU cover prior to the power supply switching off.
- Do not replace the fuses prior to the CU power supply switching off.
- The turnstile operates within voltage range from 198V AC to 242V AC only. In case of jumps in voltage exceeding the operating voltage range, use a voltage stabilizer.

9. INSTALLATION INSTRUCTIONS

9.1. Installation details

It is recommended:

- to mount the turnstile on steady and level concrete (grade 400 or higher), stone or similar foundations at least 150 mm thick;
- to level the foundation so that the anchoring points of the turnstile lie in the same plane;
- to apply reinforcing elements (400x400x250 mm) for installation on less steady foundation (the framed base is possible to be used);
- to mark the mounting holes according to Fig. 5 and Fig. 6;
- to control the vertical position of the turnstile during installation;
- when forming the passage area through the turnstile take into account that the self-centering mechanism operates as follows:
  - at the barrier arm turning at the angle of more than 60±5° the reset to home position

is effected in the direction of movement;

- at the barrier arm turning at the angle less than 60±5° the reset to home position is effected in the counter to movement direction.

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 turning in the direction of movement must be at an angle no less than 70° (Fig. 4).

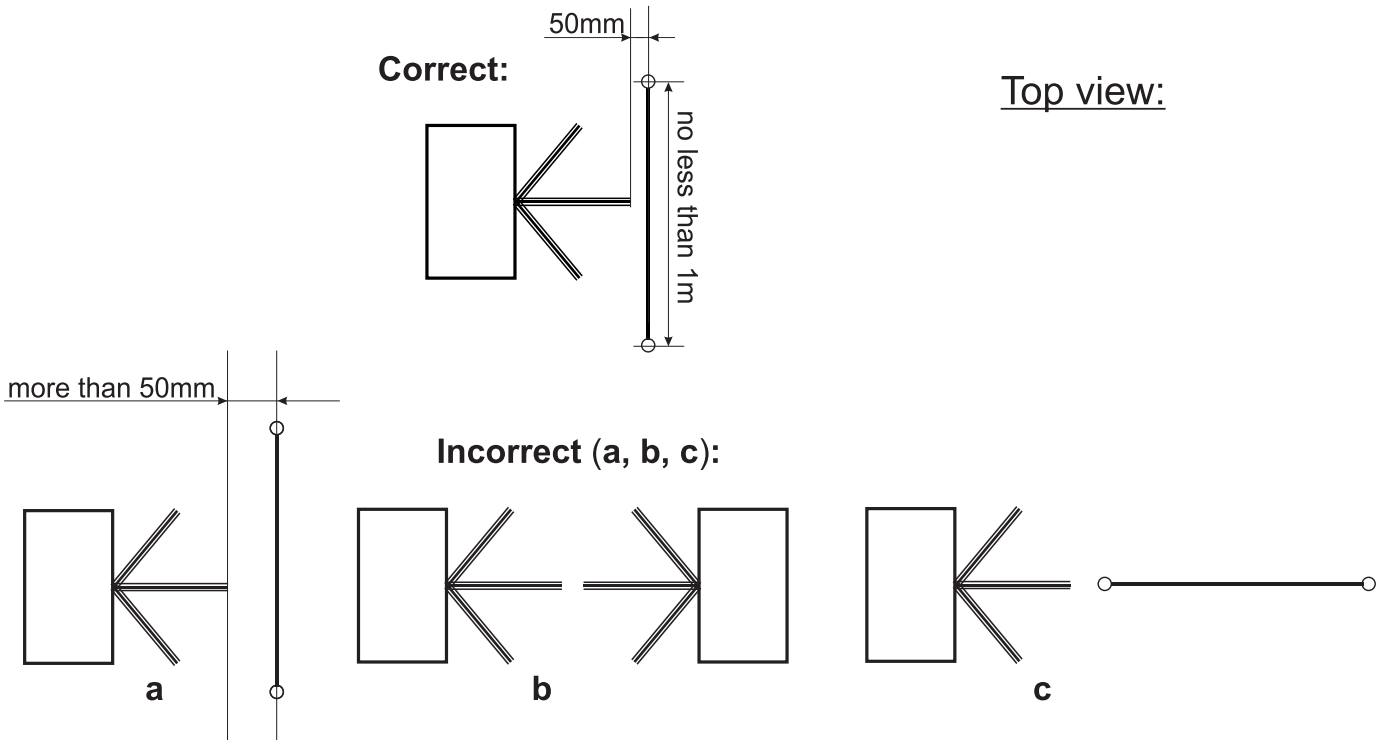


Fig. 4. Site preparation. Recommendations

9.2. Installation tools

- 1.2 - 1.5kW hammer drill;
- ∅16mm hard – alloy drill bits for anchor bolt sleeves;
- ∅5 mm hard-alloy drill bits for the CU wall mounting dowels;
- Crosshead screwdriver No. 2 (150 mm);
- S17, S13 socket wrenches;
- Plumb-line and level;
- Measuring tape 3m.

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

9.3. Installation

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

9.3.1. Unpack the turnstile, check the completeness as per Chapter 4 of this Manual and as per Chapter 3 of the Certificate.

9.3.2. Make the holes for anchor bolt sleeves (16) (Fig. 1). Mark out the mounting holes in the floor for turnstile housing (1) as shown in Fig. 5, and for the wall mount for the CU (3) as shown in Fig. 6.

9.3.3. Insert anchor bolt sleeves into the holes so that they do not stick out above the floor surface. Set up the housing and fix it with the bolts (16). Put the plugs (5) in their places.

If you lay the turnstile cable (7) under the floor surface, make a hole for the turnstile cable (7) and for the power supply cable (19) of the heating system with thermocontrol (option 1 or 2 in Fig.5) and prepare cable raceways. Fix the housing (1) (Fig. 1) after fitting the cables (7) and (19).

9.3.4. Remove the cover from the hub (11) of the turnstile housing (1), unscrewing the central bolt. Unscrew the fixing bolt (18) on the barrier arm (2). Fit the barrier arm into the mounting hole on the hub (11) and fasten the barrier arm (2) with the bolt (18). Put a spring washer under the bolt head.

Repeat the above described procedure for fitting up the remaining barrier arms.

Put the cover onto the hub (11) and fix it with the central bolt.

9.3.5. The CU (3) should be placed on a wall so that free access to the toggle switches and the convenient observation of the indicators are ensured. Prepare holes for the dowels. Fit in the dowels (15). Insert the top screws (17), suspend the CU thereon and fix it with the bottom screw (17).

9.3.6. Connect the RC (4) cable (6) and the cable of the housing (7) to the CU (3).

9.3.7. Connect the power cable of the heating system with thermocontrol (19) to the power supply unit (20). The power supply unit (20) of the heating system with thermocontrol should be placed close to the CU.

9.3.8. Once the installation is complete, the turnstile is ready for operation.

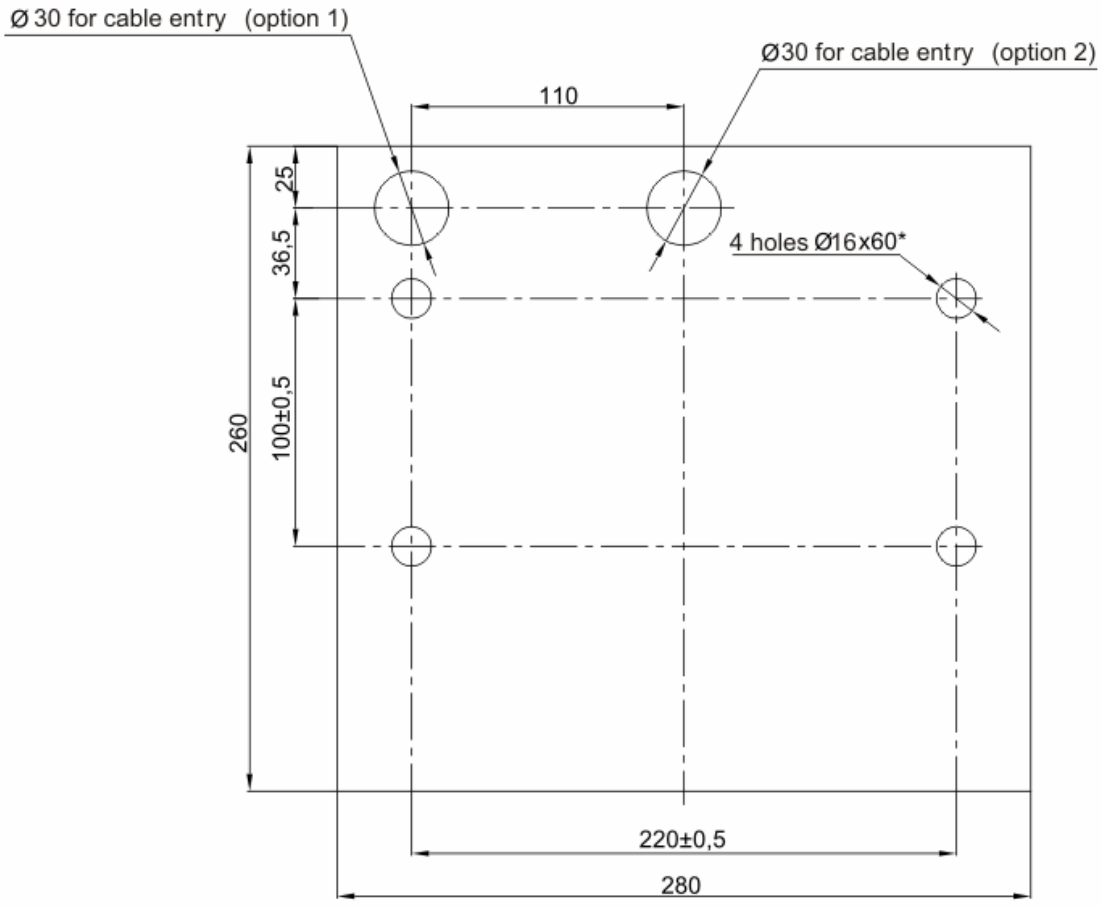


Fig. 5. Floor anchor position and cable entries for turnstile housing installation

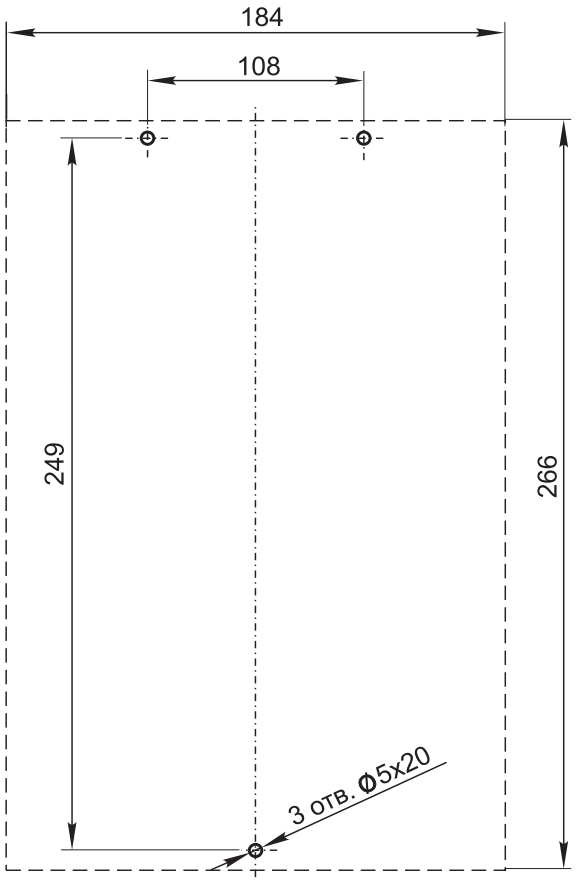


Fig. 6 Wall dowel position for the CU installation

10. OPERATION INSTRUCTIONS

WARNING!
IT IS PROHIBITED:

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

10.1. Power-up

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

Check the accuracy of all the connections and the power supply cable operability (see Clauses 9.3.6 and 9.3.7 of the Manual).

Prior to the turnstile power-up:

- set up the **«Power»** toggle switch and the **«Battery»** toggle switch to the **OFF** and to the **External** positions accordingly Fig. 2);
- lock the turnstile with the mechanical release key (9).

Put the «Bat/2A» fuse that is included in the CU spare parts kit in its place.
Connect the AC power cable (8) (Fig.1) of the CU (3) to the 220V / 50Hz AC outlet.

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

Set the **«Power»** toggle switch and the **«Battery»** toggle switch to the **ON** and the **Internal** positions accordingly.
At the same time the indicators (13) **«Power»** and **«12V»** on the CU (3), the pictogram «Red cross» on the LED indication display (12) of the turnstile housing (1) and the indicator above the **STOP** button on the RC panel (4) will light up.

10.2. Operating modes set from the RC panel

The turnstile operating modes set from the RC with the corresponding indication are described in Table 1.

It is important to take into account that:

- After its power-up the reset state of the turnstile is “Closed for entry and exit”.
- Setting the operating modes for each direction is independent: setting the operating mode for one direction does not change the operating mode set earlier on for the opposite one.
- The “Single passage in the set direction” mode can be changed to the “Free passage” 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” operating mode the turnstile is automatically locked after a person’s passage in the set direction. If the passage is not effected within the passage waiting time (this time is preset and equal to 5 seconds), the turnstile is also locked automatically. In the “Bi-directional single passage” mode,

after the passage in one direction the count-up of the passage waiting time (5 seconds) for the opposite direction is recommenced.

If the barrier arms do not reset to home position after the start of rotation within 5 seconds, the RC panel starts generating audio signals. It stops signaling when the turnstile gets back to the reset state.

10.3. Operation with the built-in SPS

In case of the AC mains failure the turnstile remains in operation and turns to the SPS built into the CU. When operating with the SPS, the **"Battery"** indicator on the CU is on. The signal **"Pwr failure"**, notifying of the AC mains failure, is transmitted to the CU **"ACS"** connector. There will be intermittent indication (with blinking interval of 0.5 seconds) on the LED indication display of the turnstile housing and on the RC.

At the SPS battery discharging up to the level of 11V, the **"Battery"** indicator starts blinking (becomes dim for short time periods) warning about the discharge. The signal **"Bat failure"** generates at the CU **"ACS"** connector.

At the battery discharging up to the level of 10.4V, the turnstile turns to the "Always closed" mode; the LED indication display is out; the blinking mode of the **«Battery»** indicator and of the red indicator on the RC changes to infrequent flashes.

In the emergency mode the turnstile can be locked and unlocked only with the mechanical release key (10) (Fig. 1).

When the AC mains is restored, the turnstile returns to normal operation from the AC mains. The built-in SPS battery will recharge automatically if the **«Battery»** toggle switch is in the **Internal** position.

NOTE!

☞ **Operation time with the built-in battery is no less than 4 hours in the "Always closed" operating mode or 1,000 passages provided that the battery is fully charged.**

☞ **The CU SPS contains a lead-acid battery, which is not recommended to be stored for a long time without recharging. For recharging during the storage period the CU must be switched on for 6–12 hours every 8 months (every 2 months when stored at ambient temperature above +30°C). The sequence of actions is given in Clause 10.1. There is no need to connect the turnstile housing and the RC to the CU at that.**

Table 1

THE TURNSTILE OPERATING MODES

	OPERATING MODES	ACTIONS TO DO	INDICATION ON THE RC PANEL	INDICATION ON THE LED DISPLAY	TURNSTILE STATUS AFTER ARMS TURNING
1	Always locked (closed for entry and exit)	Press the **STOP** button on the RC panel	The red indicator above the **STOP** button is on	The “Red cross” pictogram is on	The turnstile is locked
2	Single passage in the set direction (open for passage of one person in the permitted direction)	Press the button on the RC panel corresponding to the chosen passage direction	The green indicator above the button of the chosen passage direction and the red indicator above the **STOP** button are on	The “Green arrow” pictogram, showing the passage direction, is on	When the passage is completed, the turnstile is locked
3	Bi-directional single passage (open in both directions for ‘one-by-one’ passage)	Press both the left and right side buttons on the RC panel simultaneously	The two green indicators (left and right) and the red indicator above the **STOP** button are on	The two “Green arrow” pictograms (left and right) are on	The turnstile is locked in the direction of completed passage
4	Free passage in the set direction (open for multiple passages in the permitted direction)	Press the **STOP** button and the button corresponding to the chosen passage direction simultaneously	The green indicator above the button of the chosen passage direction is on	The “Green arrow” pictogram, showing the passage direction, is on	The turnstile remains open in the set direction
5	Free passage in the set direction, single passage in the opposite one (open for multiple passages in the permitted direction and for passage of one person in the opposite direction)	Carry out actions stated in Items 2 and 4 of the present table in either order	The two green indicators (left and right) are on	The two “Green arrow” pictograms (left and right) are on	After the passage in the free passage direction the turnstile remains open in both directions. After the passage in the single passage direction the turnstile remains open in the free passage direction but it is locked in the single passage direction
6	Always free (open for entry and exit)	Press all the three buttons on the RC panel simultaneously	The two green indicators (left and right) are on	The two “Green arrow” pictograms (left and right) are on	Turnstile remains open

10.4. Actions in emergency cases

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

To provide unobstructed and fast escape routes in emergency cases through the turnstile, the key override control can be used. The sequence of actions is described in Clause 6.4.

10.5. Troubleshooting

Possible faults, which can be cleared by the users themselves, are listed in Table 2.

Table 2

FAULT	POSSIBLE CAUSE	REMEDY
The turnstile won't work after its power-up Light indication on the CU is off	The "**220V/0.5A**" fuse is burnt out	Disconnect the CU from the AC mains and replace the fuse on the CU lower panel
The CU "**Power**" indicator is on but the "**12V**" indicator is off. The RC generates continuous audio signal	The **"=12V/0.5A"** is burnt out likely due to external short circuit	Disconnect the CU from the AC mains, clear the circuit and replace the fuse on the CU lower panel
At the powering up with the built-in SPS, the **"Battery"** indicator is blinking and may switch off	The battery of the built-in SPS is discharged	Connect and use the available external power supply unit
In the case of the AC mains failure and the CU operation with the external/built-in SPS, the turnstile won't work, the indicators on the CU are off	The **"=Bat/2A"** fuse is burnt out	Disconnect the CU from the AC mains and replace the fuse on the CU lower panel

All other faults shall be defaulted by the Manufacturer only.
In case the heating system with thermocontrol is switched off at low temperatures (lower -5 °C), rotation completion time of the barrier arms will increase pro rata decrease temperature.

11. TRANSPORTATION AND STORAGE

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

During storage and transportation the boxes can be stacked no more than 4 layers high.

Storage of the turnstile housing is allowed in dry indoor facilities at the ambient air temperature from -40 to +45 °C and relative air humidity of up to 75% at + 15 °C. The environment should be free of acid and alkali vapours and gases that cause corrosion.

Storage of the control unit is allowed at ambient air temperature from - 10 °C to + 40 °C and at relative air humidity of up to 80% at + 25 °C. The environment should be free of acid and alkali vapours and gases that cause corrosion.

NOTE. If the control unit is to be stored for a long time, it is recommended keeping its accumulator battery separately, observing requirements to storage of hermetic unused batteries.

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.

12. MAINTENANCE

The turnstile housing maintenance is required once a year or in case of failures.
The maintenance should be carried out by a qualified mechanic who has studies carefully this Manual.

Prior to the turnstile maintenance works disconnect the CU power supply from the AC mains: set up the **"Power"** toggle switch to the **OFF** position, the **"Battery"** toggle switch — to the **External** position; take out the plug of the CU power cable (8).

It is necessary to disconnect power supply of the heating system with thermocontrol from the AC mains. For the disconnection sequence see the certificate of the power supply unit of the heating system with thermocontrol.

Keep away the turnstile housing from atmospheric precipitates getting inside the housing during maintenance.

To do maintenance remove the cover with LED indication display (12) from the turnstile housing in the following way:

- unscrew the central bolt of the cover with LED indication display (12), located beneath
  the hub (11) with a socket wrench S10;
- pull the bolt out of the turnstile housing hole;
- remove the cover with LED indication display (12) by lifting the cover by its rear edge in the LED indication display direction and taking it out of the hooks;
- carefully disconnect the indication board cable header from the control device onnector and place the cover with LED indication display on the level steady surface;
- disconnect light indication connector of the heating system with thermocontrol from the heater controller.

Check visually the self-centering mechanism (the pusher, the springs and the roller), the optical arm rotation sensors and the damper (see Fig. 8).

Lubricate the friction units of the self-centering mechanism (In Fig.8 the places are marked with **1-3** numbers, heating unit is not shown):

- four bushes of the resetting device (two — on the rotation axis of the pusher, two — on the fastening axis of the springs);
- holes in the fastening parts of the springs;
- lock cylinder of the mechanical lock (11) through the keyhole.

For lubrication it is recommended to use machine oil. Avoid the ingress of lubricant on the arm rotation sensor disc and the roller surfaces.

Remove dust from the arm rotation sensor disc, located in the spacing of the arm rotation 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.

Connect the cable header of the indication board to the control mechanism connector and mount the cover with LED indication display (12) back into its place in the reverse order to the dismantling. When the cover with LED indication display mounting is carried out correctly it does not need much effort.

Check reliability of the barrier arms (2) fastening and, if necessary, tighten the bolts (18) of the barrier arms. To tighten the bolts:

- remove the cover from the hub (11) of the turnstile housing, unscrewing the screw;
- tighten the bolts (18) of the barrier arms (2) with the S13 socket wrench;
- put the cover onto the hub (11) and fix it with the screw.

Check the reliability of the turnstile housing fastening to the floor and if necessary, tighten the anchor bolts.

To do that:

- remove 4 plastic plugs (5) out of the holes in the turnstile housing base;
- tighten the anchor bolts with a socket wrench S17;
- put the plastic plugs (5) into their places.

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

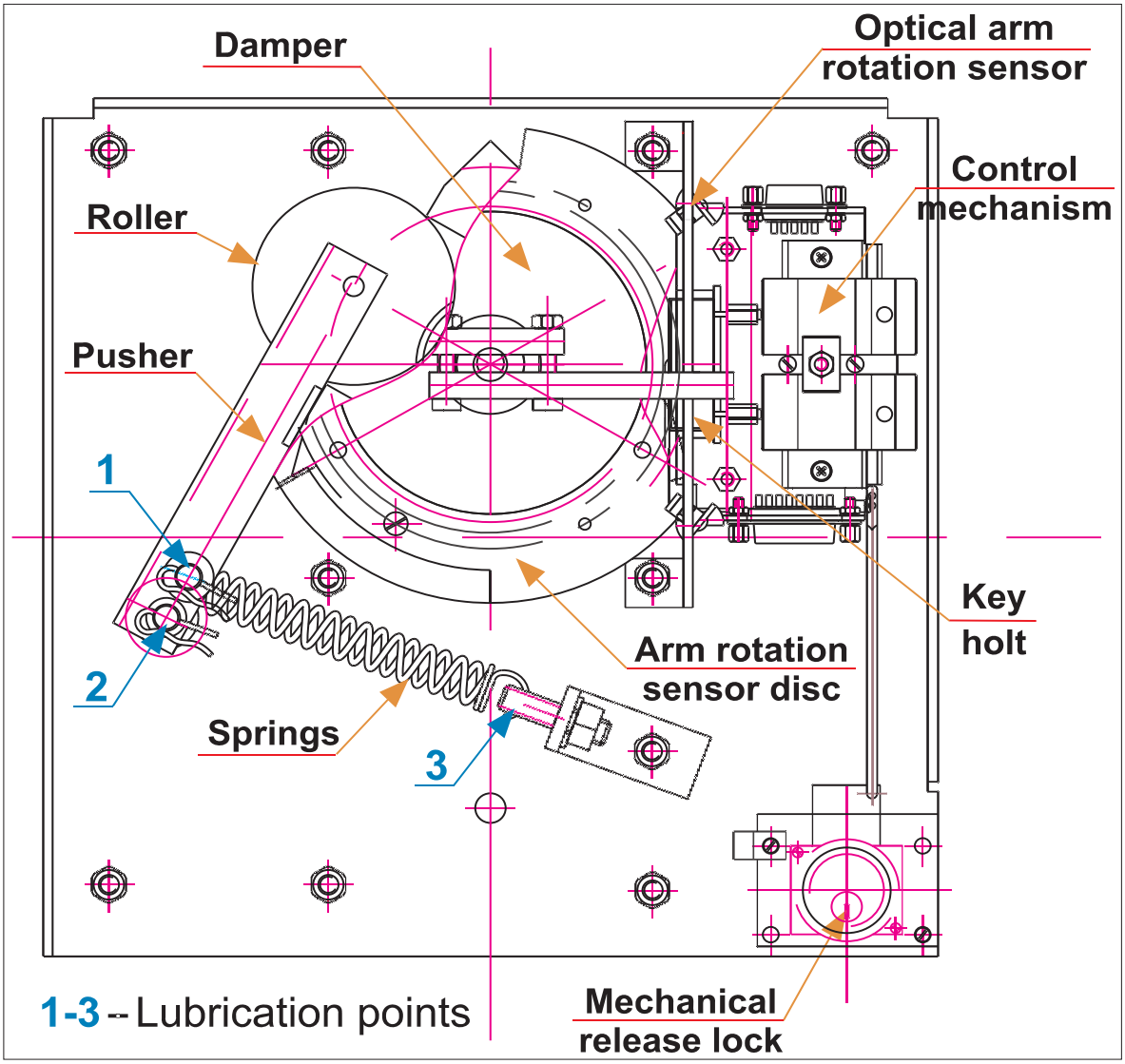
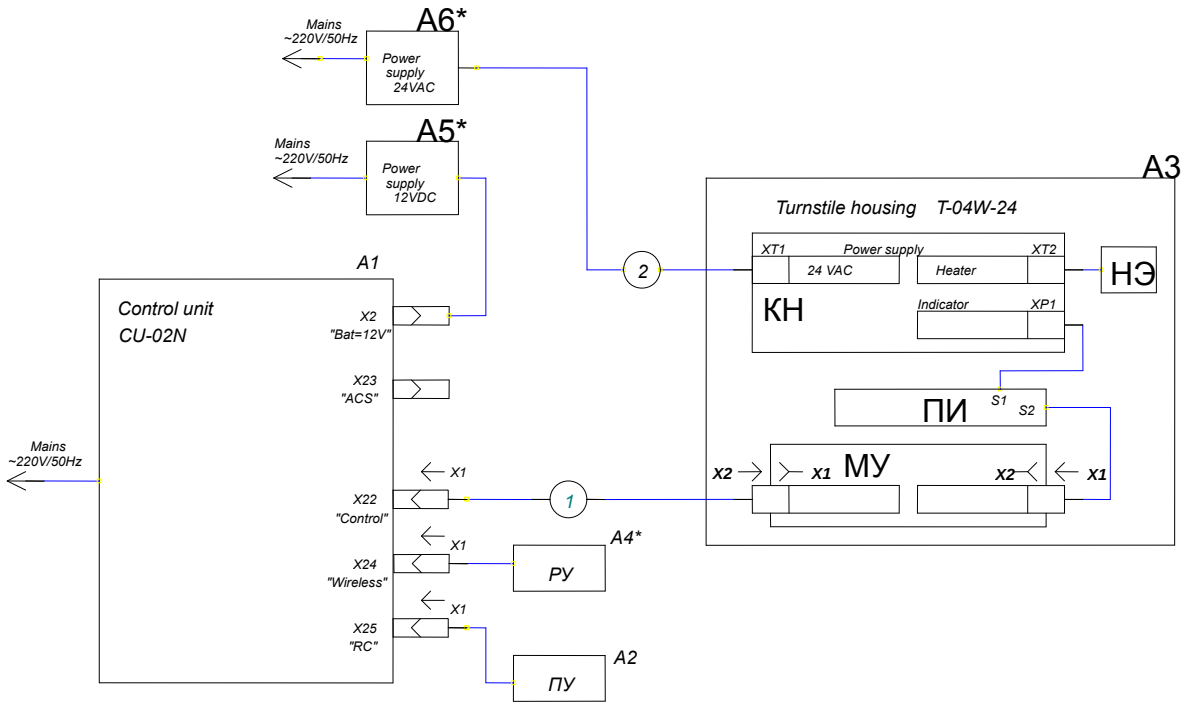


Fig. 8. Location of the interior components of the turnstile housing



Connection layout elements.

Symbol	Name	Q-ty	Note
A1	*Control unit CU-02N*	*1*	
A2	*Remote control panel H-06/4.100*	*1*	
A3	*Turnstile housing T-04W-24*	*1*	
*A4**	*Wireless remote control*	*1*	*MSRF-4*
*A5**	*Power supply of the turnstile*	*1*	*12В, 1,2А*
*A6**	*Power supply of the heating system with thermocontrol*	*1*	*24VAC, 2,5А*
* This equipment is not included in a standard delivery set			

ПИ - indication board;
МУ control mechanism;
ПУ - remote control panel;
РУ - wireless remote control.
КН - controller of a heating system with thermocontrol;
НЭ - heating element.

Fig. 9. Connection layout of control devices