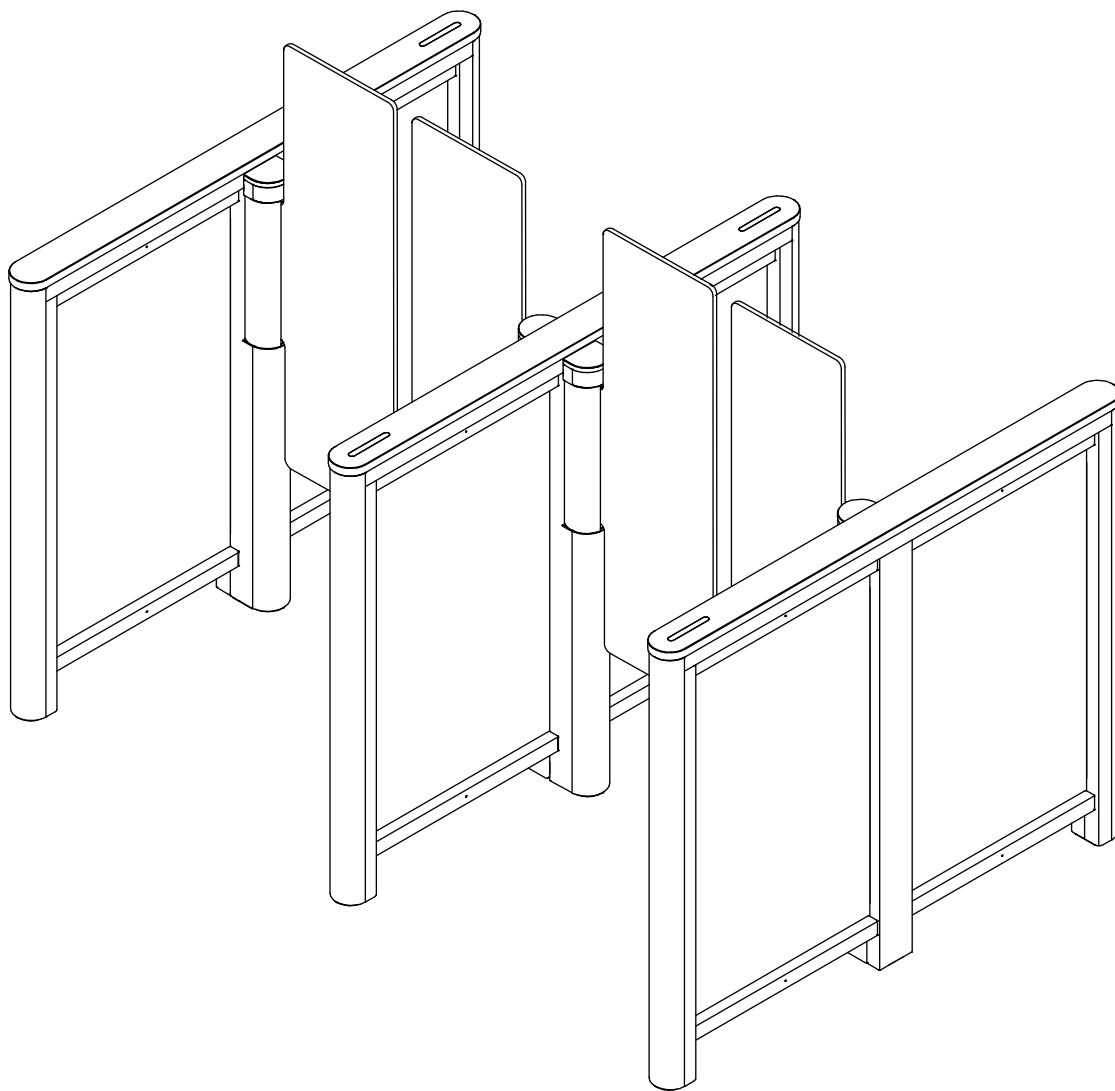


**PERCo**<sup>®</sup>

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# ASSEMBLY AND OPERATION MANUAL



## **ST-11, STD-11**

**ERC**  
**CE**

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SPEED GATE AND DOUBLE-SIDED SECTION

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**Dear Customer!**

*Thank you for choosing the turnstile made by PERCo.*

*You have purchased a high-quality product, which will serve you for many years to come, if you carefully follow installation and operation rules.*

**The Assembly and Operation Manual for the ST-11 Speed gate and STD-11 Double-sided section** (hereinafter referred to as the *Manual*) contains the instructions on safe transportation, storage, installation, operation, and maintenance of the above-mentioned products. The products must be installed by persons who have fully studied this Manual.

Abbreviations adopted in the Manual:

- PS – power supply;
- RC panel – remote control panel;
- WRC – wireless remote control;
- ACS – access control system;

In view of continuous improvement of its products, the Manufacturer reserves the right to modify, without prior notice, the product design without degrading its technical specifications.

**1 APPLICATION**

The **ST-11 Speed gate** (hereinafter referred to as the *speed gate*) is a blocking device with swing panels designed for regulation of pedestrian flows at checkpoints of administrative buildings, at banks, shops, railway terminals, airports, etc.



**Attention!**

The **ST-11 Speed gate** is designed for passage of pedestrians taller than 1 m; otherwise, correct operation of the speed gate is not guaranteed. Children under one meter in height can pass through the speed gate **only when led by the hand and accompanied by adults**<sup>1</sup>.

The speed gate consists of two sections: **ST-11/M** (hereinafter, the *Master section*) and **ST-11/S** section (hereinafter, the *Slave section*). In the standard delivery set, the speed gate forms one passage zone. The passageway width depends on the swing panel model selected when placing an order.

If there is a need to increase the number of passage zones, **STD-11 Double-sided sections** (hereinafter referred to as the *double-sided section*) can be purchased. Each double-sided section forms one extra passage zone.



**Note:**

Access card readers manufactured by **PERCo (IR13, IR19, IR19 OEM)** or by third-party manufacturers can be installed inside the speed gate's sections. **Access card readers are not included** in the standard delivery set of the speed gate! Readers are to be selected, purchased, and installed in the product by the customer (installer) with due consideration for the checkpoint design as well as for ACS and management controller characteristics. Readers must meet the following requirements:

- Overall dimensions (length × width × height) ..... max. 155×68×28 mm
- ID reading range ..... min. 40 mm

**2 OPERATING CONDITIONS**

In terms of resistance to environmental exposure, the speed gate complies with GOST (State Standard) 15150-69, category NF4 (operation in premises with climate control).

Operation of the speed gate is allowed at an ambient air temperature from +1°C to +50°C and relative air humidity of up to 80% at +25°C.

<sup>1</sup> If the speed gate is installed at children's institutions or at organizations working with children, where a more secure passage mode is required, it is recommended to reflash the speed gate controller with special firmware (*ST11\_Children*). It is distinguished by a special operation algorithm, under which closing swing panels will open if at least one sensor of the speed gate is active.  
In order to get necessary recommendations regarding the firmware installation, please contact **PERCo's** technical support team.

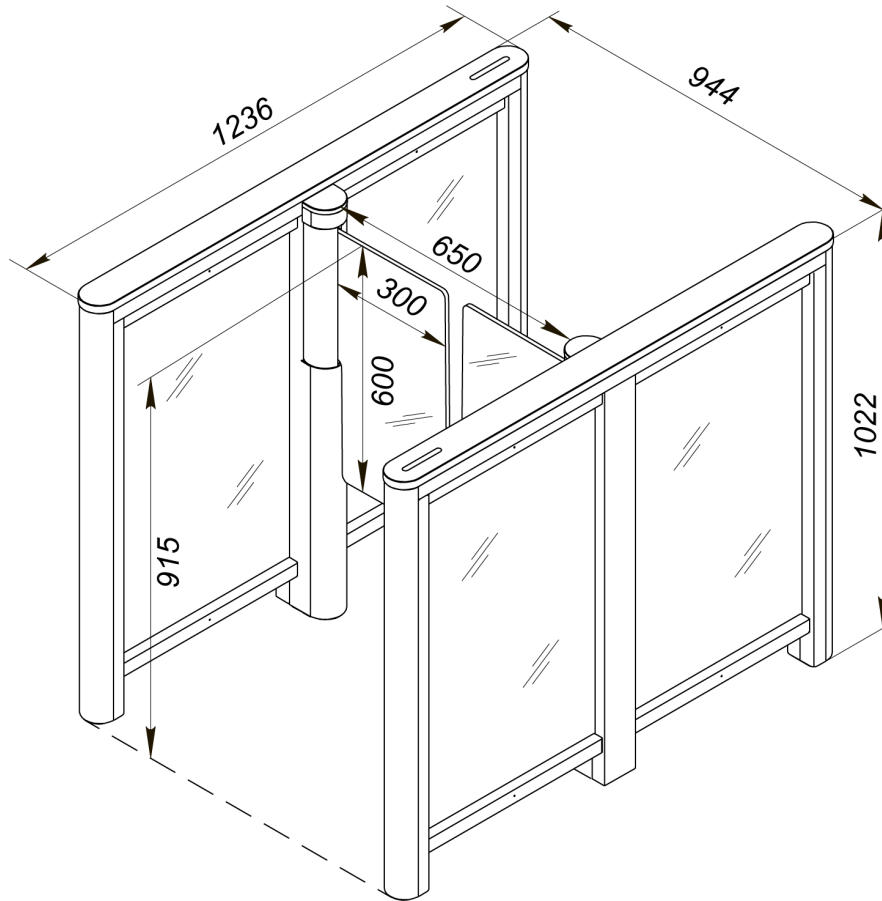


Figure 1. Overall dimensions of the speed gate with ATG-300 swing panels

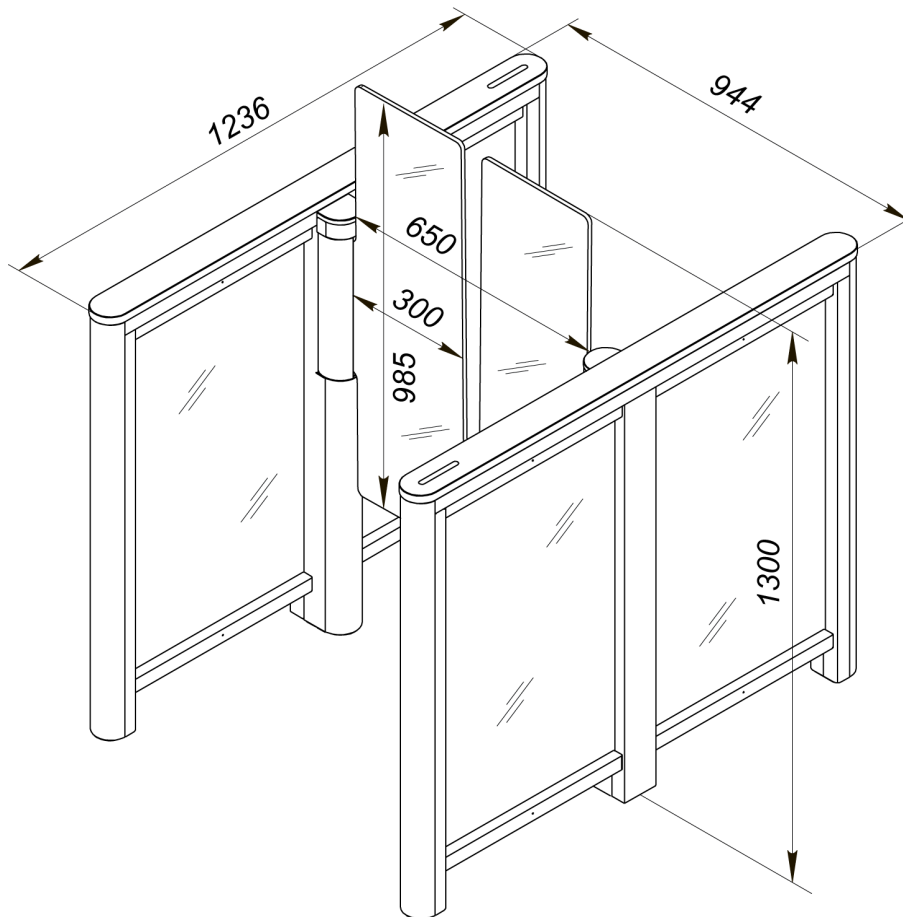


Figure 2. Overall dimensions of the speed gate with ATG-300H swing panels

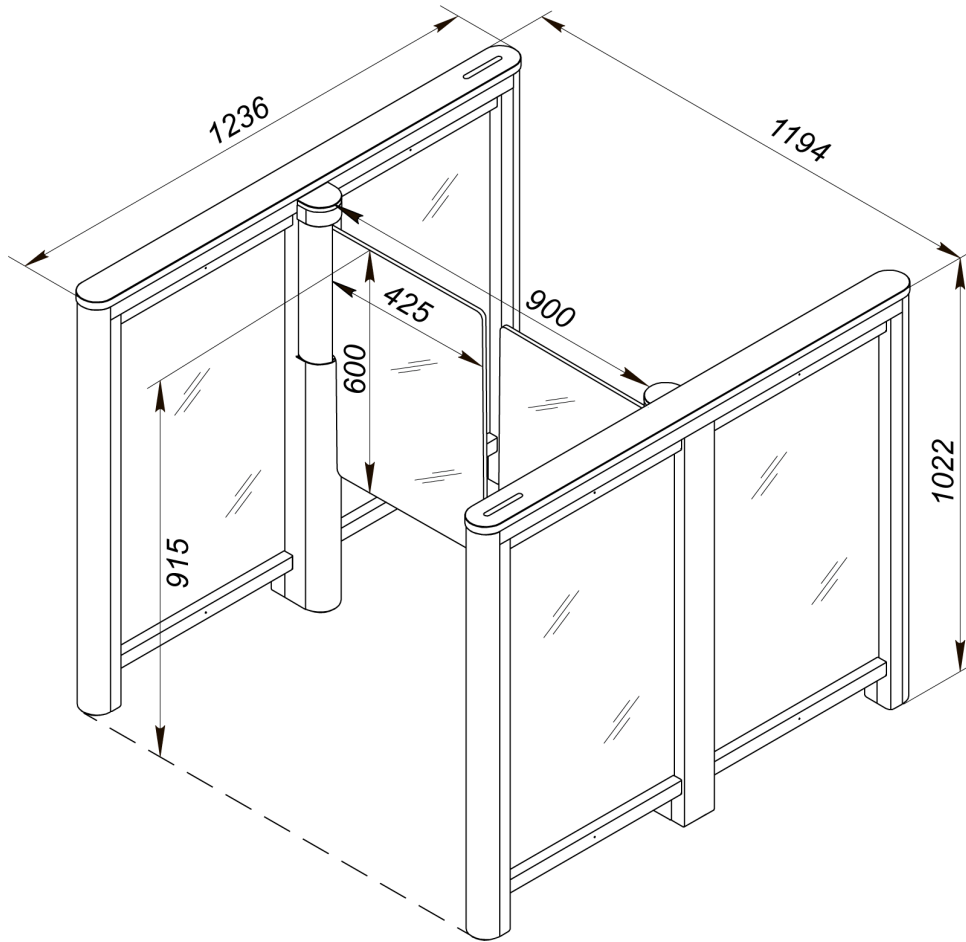


Figure 3. Overall dimensions of the speed gate with ATG-425 swing panels

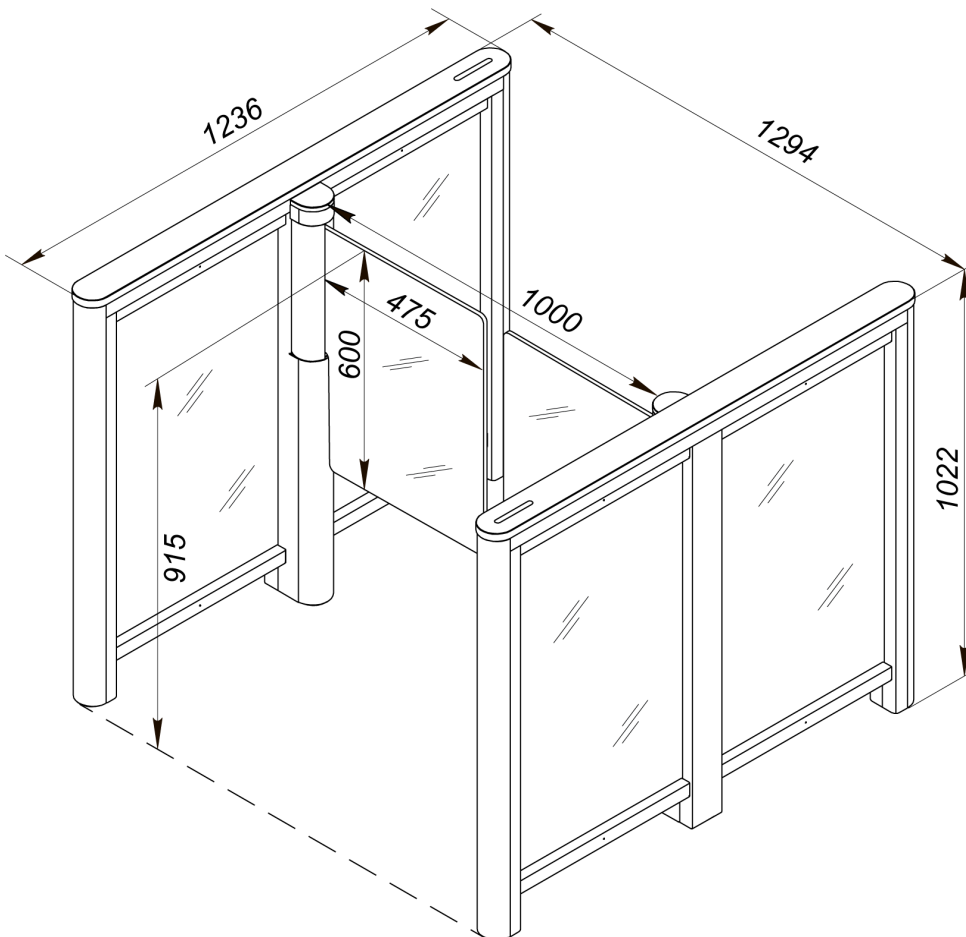
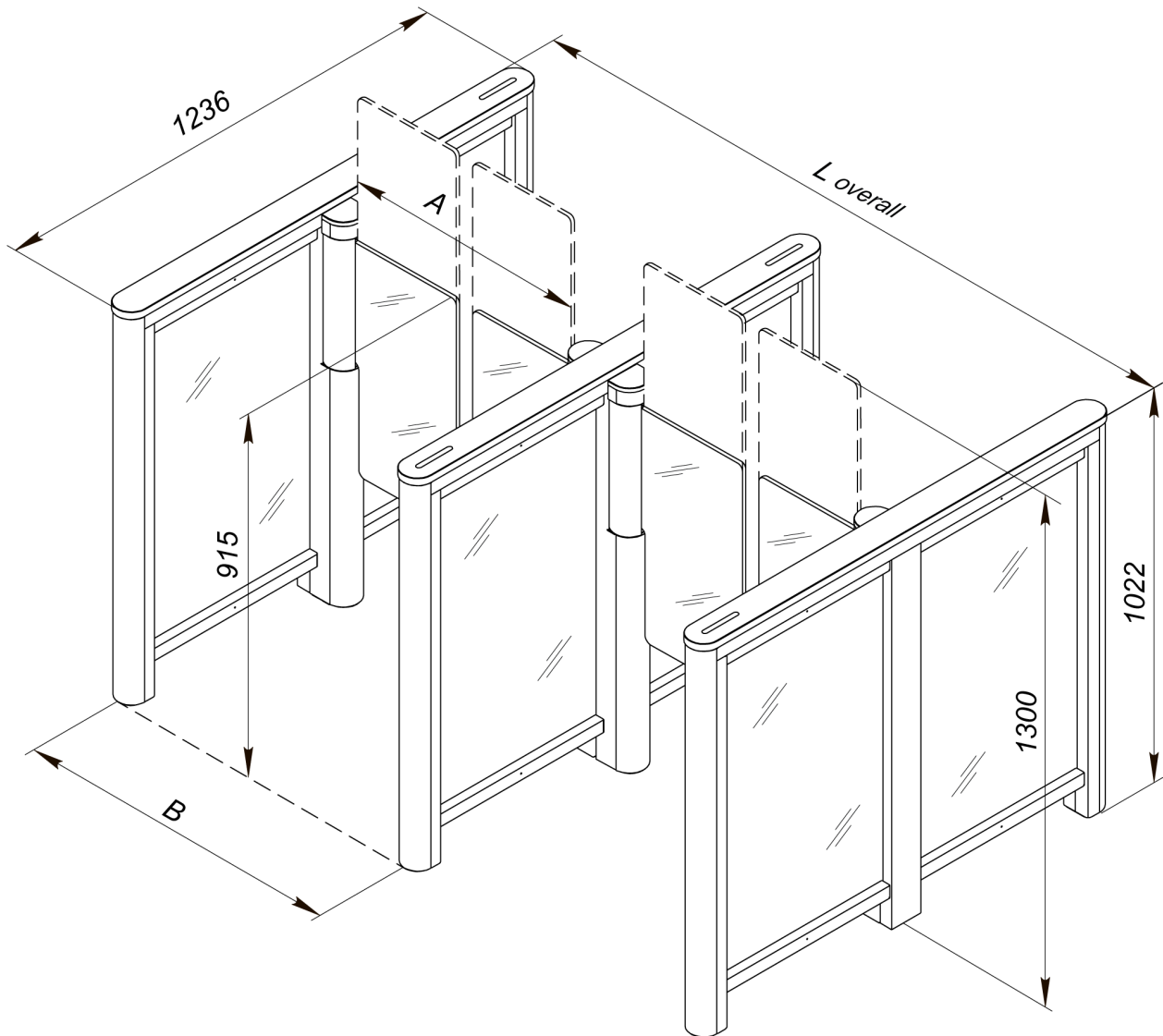


Figure 4. Overall dimensions of the speed gate with ATG-475 swing panels



for ATG-300 – A=650, B=864;  
 for ATG-300H – A=650, B=864;  
 for ATG-425 – A=900, B=1114;  
 for ATG-475 – A=1000, B=1214

$L_{overall} = 864n + 1114m + 1214k + 84$  (mm),  
 n – number of the ATG-300 (ATG-300H),  
 m – number of the ATG-425,  
 k – number of the ATG-475

Figure 5. Overall dimensions of the speed gate when organizing several passage zones

### 3 TECHNICAL SPECIFICATIONS

Operating voltage <sup>1</sup> .....	24±2.4 V DC
Consumption current <sup>2</sup> .....	max. 6.5 A
Power consumption <sup>2</sup> .....	max. 160 W
Throughput rate in the single passage mode .....	up to 60 persons / min
Passageway width:	
with <b>ATG-300</b> , <b>ATG-300H</b> swing panel .....	650 mm
with <b>ATG-425</b> swing panel .....	900 mm
with <b>ATG-475</b> swing panel .....	1000 mm
Number of built-in intrusion detectors:	
upper level .....	24
lower level .....	24
RC panel cable length <sup>1</sup> .....	min. 6.6 m

<sup>1</sup> The power supply unit is connected only to the control board located in the *Master* section (on the *Master* side of the double-sided section) and marked as *ST-11.771*.

<sup>2</sup> Consumption current and power consumption are given for each product, **ST-11** and **STD-11**, individually.

IP Code .....	IP41 (EN 60529)
Electric shock protection class .....	III (IEC 61140)
Mean time to failure .....	min. 12 000 000 passages
Mean lifetime .....	min. 8 years
Overall dimensions (L × W × H; see Fig. 1 – 5), mm:	
with <b>ATG-300</b> swing panel .....	1236×944×1022 mm
with <b>ATG-300H</b> swing panel .....	1236×944×1300 mm
with <b>ATG-425</b> swing panel .....	1236×1194×1022 mm
with <b>ATG-475</b> swing panel .....	1236×1294×1022 mm



**Note:**

Use the following formula to calculate the overall speed gate width in case several passage zones are arranged (Fig. 5): **L overall = 864 n + 1114 m + 1214 k + 84 (mm)**, where:  
 n – number of **ATG-300** and **ATG-300H** swing panel sets installed;  
 m – number of **ATG-425** swing panel sets installed;  
 k – number of **ATG-475** swing panel sets installed.

Weight (net):

<b>ST-11/M</b> section .....	max. 65 kg
<b>ST-11/S</b> section .....	max. 65 kg
<b>STD-11</b> double-sided section .....	max. 80 kg
<b>ATG-300</b> swing panel .....	max. 6 kg
<b>ATG-300H</b> swing panel .....	max. 9 kg
<b>ATG-425</b> swing panel .....	max. 8 kg
<b>ATG-475</b> swing panel .....	max. 9 kg

## 4 DELIVERY SET

### 4.1 Standard delivery set

#### 4.1.1 ST-11 Speed gate

**Main equipment:**

Section <b>ST-11/M (Master)</b> <sup>2</sup> .....	1
Section <b>ST-11/S (Slave)</b> <sup>2</sup> .....	1
Section top cover .....	2 (in a separate box)



**Note:**

The type of section top covers is to be chosen by the Customer when placing an order. The following top cover models are available for the **ST-11** speed gate section:

- **STC-11M** – made of artificial stone with a built-in indication block;
- **STC-11S** – made of stainless steel with a built-in rubber pad with a mnemonic image;
- **STC-11S-NR** – made entirely of stainless steel, with no possibility of installing readers beneath the top cover.

Central post indication block .....	2
Swing panel cover plate .....	4
Glass swing panel .....	2 (in a separate box)



**Note:**

The type of the swing panel is to be chosen by the Customer when placing an order. The following swing panel models are available (see Fig. 1, 2, 3, 4):

- **ATG-300** – for arranging a 650 mm wide passageway;
- **ATG-300H** – swing panel with an increased height for arranging a 650 mm wide passageway;
- **ATG-425** – for arranging a 900 mm wide passageway;
- **ATG-475** – for arranging a 1000 mm wide passageway.

RC panel with cable .....	1
Jumper .....	3

<sup>1</sup> The maximum allowable length of the RC-panel cable amounts to 40 m (supplied upon request).  
<sup>2</sup> Both sections are delivered with the following dismantled parts: top covers, swing panels, swing panel cover plates, and central indication blocks.

**Assembly and installation tools:**

Mounting kit of the section top cover:	
M4×16 screw .....	8
spring washer (4) .....	8
Mounting kit of the central post indication block:	
M5×10 screw .....	4
washer (5) .....	4
spring washer (5) .....	4
Mounting kit of the swing panel cover plate:	
M4×10 screw .....	8
washer (4) .....	8
Mounting kit of the swing panel:	
M10×30 bolt .....	6
M10 nut.....	6
washer (10) .....	12
spring washer (10) .....	6
plastic bushing .....	6
Cardboard template for marking the mounting surface .....	1

**Operational documentation:**

Certificate .....	1
Assembly and Operation Manual .....	1

**Packaging:**

Transportation box for the <i>Master</i> and <i>Slave</i> sections .....	1
Transportation box for section top covers .....	1
Transportation box for swing panels .....	1

**4.1.2 STD-11 Double-sided section****Main equipment:**

Double-sided section <sup>1</sup> .....	1
Section top cover .....	1 (in a separate box)

**Note:**

The type of section top covers is to be chosen by the Customer when placing an order. The following top cover models for the **STD-11** double-sided section are available:

- **SDC-11M** – made of artificial stone with a built-in indication block;
- **SDC-11S** – made of stainless steel with a built-in rubber pad with a mnemonic image;
- **STC-11S-NR** – made entirely of stainless steel, with no possibility of installing readers beneath the top cover.

Central post indication block .....	2
Swing panel cover plate .....	4
Glass swing panel .....	2 (in a separate box)

**Note:**

The type of the swing panel is to be chosen by the Customer when placing an order. The following swing panel models are available (see Fig. 5):

- **ATG-300** – for arranging a 650 mm wide passageway;
- **ATG-300H** – swing panel with an increased height for arranging a 650 mm passageway;
- **ATG-425** – for arranging a 900 mm wide passageway;
- **ATG-475** – for arranging a 1000 mm wide passageway.

RC panel with cable .....	1
Jumper .....	3

**Assembly and installation tools:**

Mounting kit of the section top cover:	
M4×16 screw .....	4
spring washer (4) .....	4

<sup>1</sup> The section is delivered with the following dismantled parts: a top cover, swing panels, swing panel cover plates, and central indication blocks.



Mounting kit of the central post indication block:	
M5×10 screw .....	4
washer (5) .....	4
spring washer (5) .....	4
Mounting kit of the swing panel cover plate:	
M4×10 screw .....	8
washer (4) .....	8
Mounting kit of the swing panel:	
M10×30 bolt .....	6
M10 nut.....	6
washer (10).....	12
spring washer (10) .....	6
plastic bushing .....	6
<b>Operational documentation:</b>	
Certificate .....	1
<b>Packaging:</b>	
Transportation box for the double-sided section .....	1
Transportation box for section top cover .....	1
Transportation box for swing panels .....	1

## 4.2 Additional equipment to be supplied upon request

Wireless remote control <sup>1</sup> .....	in the required quantity
<b>IR13</b> or <b>IR19</b> or <b>IR19 OEM</b> Access card readers.....	2 per passage zone
<b>FP-11Q.1</b> Front panel with barcode scanner .....	in the required quantity
Galvanized M10 anchor with DIN7984 hexagon socket bolt and washer:	
for the <b>ST-11</b> Speed gate .....	12
for the <b>STD-11</b> Double-sided section .....	8
Safety stickers (2 pcs in a set):	
<b>SG1</b> Yellow circle .....	1 set for one passage zone
<b>SG2</b> Matt ring.....	1 set for one passage zone

## 5 DESIGN AND OPERATION

### 5.1 Main features

- The speed gate allows its users to pass through it one by one in one direction without the swing panels being closed between their passages.
- The speed gate is a normally-open device, which means that when the equipment is de-energized, the swing panels rotate freely at a ±90° angle.
- Intrusion detectors are installed on two levels throughout the speed gate’s passage zone. This allows the user’s position to be tracked within the passage zone. The speed gate also makes it possible for several users moving in the same direction to be in the same passage zone at the same time.
- Several swing panel models are available for the choice when placing an order, depending on the passageway width and operational features.
- Several models of section top covers are available for the choice when placing an order; they can be made of tempered glass or stainless steel.
- The number of the passage zones can be increased if necessary by installing **STD-11** double-sided sections.
- The turnstile supports two control modes: pulse and potential.
- It is possible to switch the speed gate to the *Automatic opening in the selected direction* mode – entering the speed gate will force the swing panels to automatically open in the preset direction and to close after the passage is finished.
- The speed gate will generate an alarm signal in all operation modes if the passage zone is occupied for more than 30 seconds.
- The speed gate can function as an operating device included in an ACS or as a standalone unit operated from an RC panel.

<sup>1</sup> The WRC kit contains a receiver, which is connected to the control board, and transmitters designed as fobs.

- Proximity card readers can be embedded inside the sections under the top cover.
- The top covers made of artificial stone (**STC-11M**, **SDC-11M**) are outfitted with indication blocks.
- The position of swing panels can be regulated in the initial (locked) state (training mode).
- Indication blocks of passage permission / denial are located on the central post in the line of sight of users when they pass through the speed gate. This allows the users not to be distracted by searching for other indication blocks and speeds up their passage through the speed gate.
- It is possible to connect remote indication blocks to duplicate passage permission / denial indication.
- A sound alarm (siren) can be connected to the speed gate to warn the operator about unauthorized access attempts.
- Automatic emergency unblocking of the passage is enabled upon receipt of the *Fire Alarm* signal. The *Fire Alarm* signal can be sent by a security and fire alarm device or by the operator using an emergency button (hereinafter referred to as the emergency passage unblocking device).
- The components are made of polished stainless steel. The swing panels and filling glass are made of 8-10 mm thick tempered glass.

## 5.2 Design

The speed gate's design is shown in Fig. 6; the double-sided section's design is shown in Fig. 7. The numbers of the equipment parts are stated in the Manual in accordance with Fig. 6 and 7.

The speed gate consists of two sections, *Master* and *Slave*, and an RC panel. Each section is equipped with a motorized rotary swing panel (4). The *Slave* section is connected to the *Master* section with two connection cables, DC (16) and CAN (17).

Use double-sided sections to arrange more passage zones. The double-sided section comes complete with an RC panel and is equipped with two rotary swing panels (4): on the *Master* side and on the *Slave* side. Each swing panel has its motor drive. The *Slave* side is connected to the speed gate's *Master* section or to the *Master* side of another double-sided section with two connection cables, DC and CAN (16, 17). The speed gate's *Slave* section (*Slave* side of the next double-sided section) is connected to the *Master* side with DC and CAN cables from the standard delivery set of this speed gate (double-sided section).

### 5.2.1 Section

Each section consists of three posts: one central (1) and two side (9) posts. The posts are interconnected by a section top duct (7) with two top ducts of intrusion detectors (11) and two bottom ducts of intrusion detectors. Each section features a section top cover (6), which covers the top duct. The ducts of intrusion detectors are closed with covers (15).

The space between posts is occupied with filling glass (12), which prevents unauthorized entry into the passageway. Bolts that fasten the filling glass to the central post are covered with the central post's rear panel (13). Bolts that fasten the filling glass to the side posts are covered with the front panels (10).

The upper part of the central post (1) features an indication block (5) with color indicators of passage permission / denial.

A swing panel (4) is fixed to the central post's rotary support. The rotary support is covered with the swing panel's cover plates (3). The rotary support is operated by a motor drive located under the central post's cover plate (2).

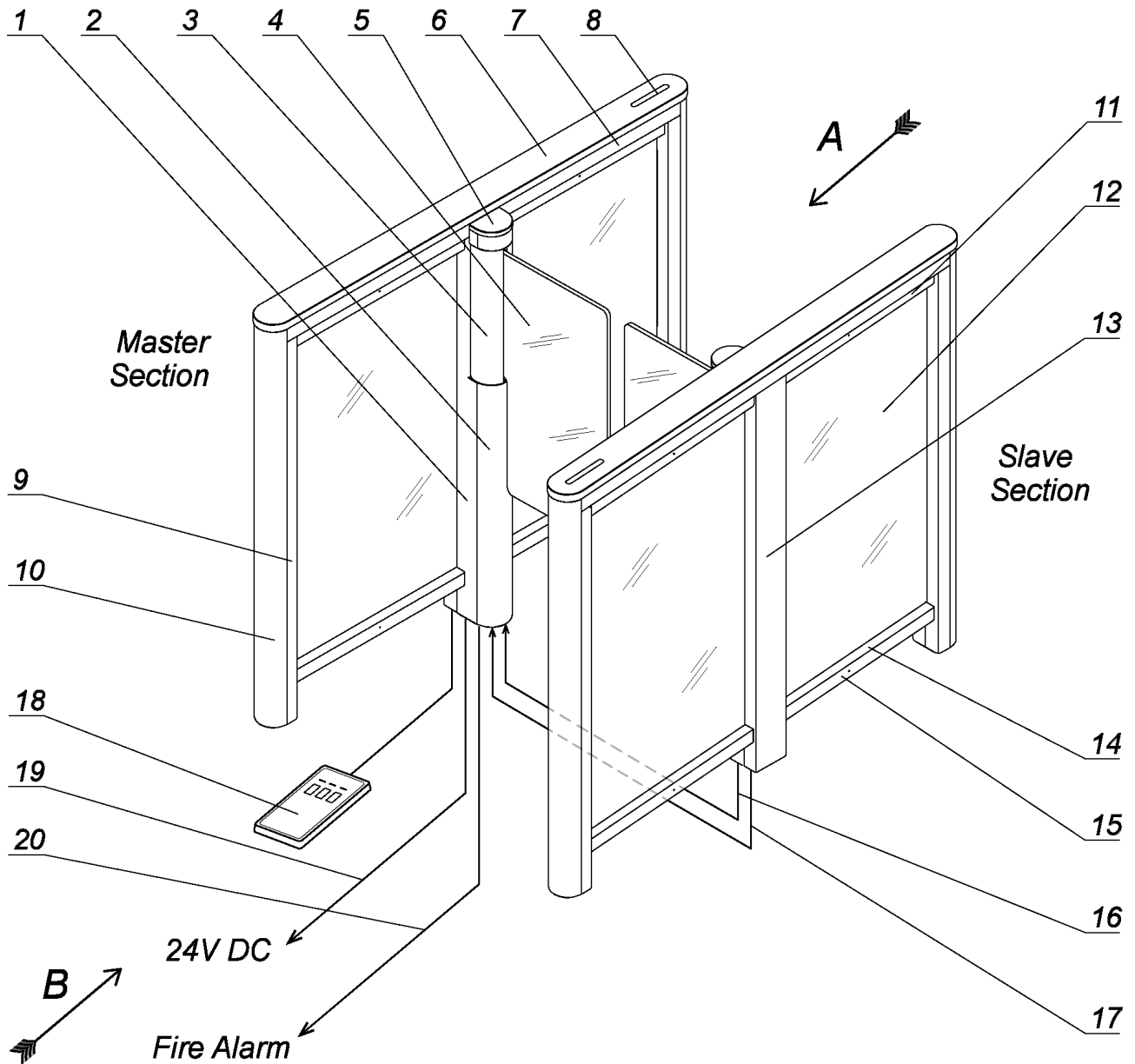
The top covers made of artificial stone (**STC-11M** and **SDC-11M**) are outfitted with indication blocks (8).

The bottom part of the central post of the *Master* section (side) features the **ST-11.771** speed gate control board (hereinafter, the *control board*). The PS unit, RC panel (WRC receiver), *Fire Alarm* device, and DC and CAN connection cables from the *Slave* section are connected to the control board.

### 5.2.2 Indication blocks

Each section features the following indication blocks:

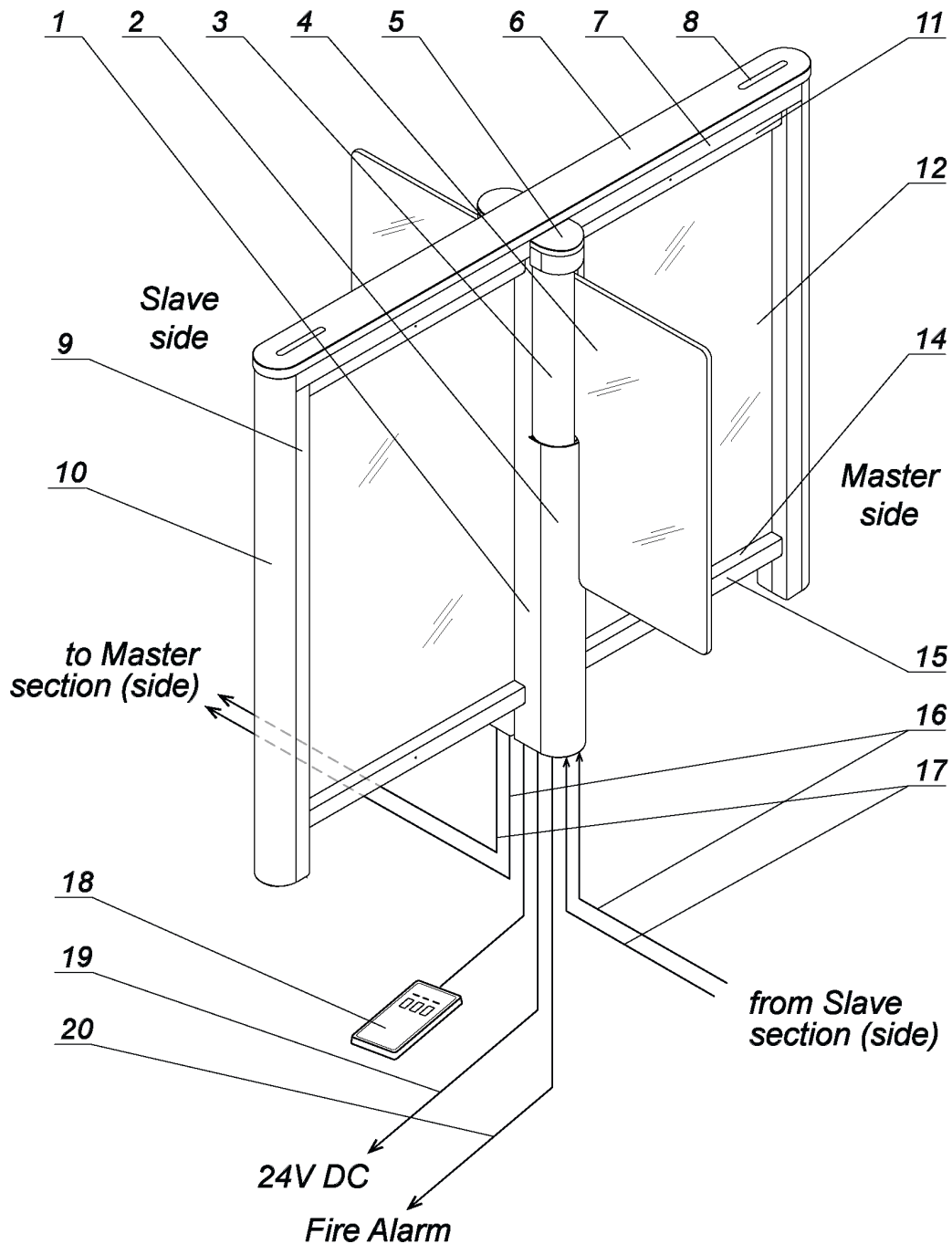
- The indication block (8) on the top cover made of artificial stone (one on the **STC-11M** cover and two on the **SDC-11M** cover) is a red indicator for the access card presentation area. When the access card is presented, and passage is granted, the indicator turns green.
- The central post indication block (5) is designed for color indication of passage permission (green light) / denial (red light) for each direction separately.



**Figure 6. Overall view and design of ST-11**

- 1 – central post; 2 – central post cover plate; 3 – swing panel cover plate; 4 – swing panel;
- 5 – central post indication block; 6 – section top cover; 7 – section top duct;
- 8 – indication block on the top cover; 9 – side post; 10 – front panel of the side post;
- 11 – intrusion detector's top duct with its cover; 12 – filling glass;
- 13 – rear panel of the central post; 14 – bottom duct of the intrusion detector;
- 15 – cover of the intrusion detector duct; 16 – DC cable; 17 – CAN cable;
- 18 – RC panel with cable; 19 – PS unit cable<sup>1</sup>; 20 – *Fire Alarm* cable<sup>1</sup>.

<sup>1</sup> Not included in the standard delivery set.



**Figure 7. Overall view and design of STD-11:**

- 1 – central post; 2 – central post cover plate; 3 – swing panel cover plate; 4 – swing panel;  
 5 – central post indication block; 6 – section top cover; 7 – section top duct;  
 8 – indication block on the top cover; 9 – side post; 10 – front panel of the side post;  
 11 – intrusion detector's top duct with its cover; 12 – filling glass;  
 14 – bottom duct of the intrusion detector; 15 – cover of the intrusion detector duct; 16 – DC cable;  
 17 – CAN cable; 18 – RC panel with cable; 19 – PS unit cable<sup>1</sup>; 20 – Fire Alarm cable<sup>1</sup>.

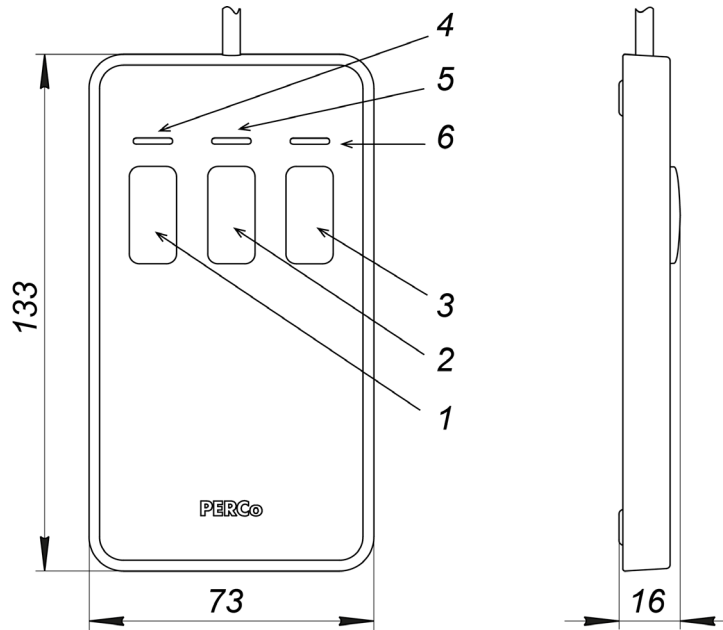
<sup>1</sup> Not included in the standard delivery set.

### 5.2.3 RC panel

The overall view of the RC panel is shown in Fig. 8.

The RC panel (18) is a small desktop device made of shockproof ABS plastic. The RC panel is designed for speed gate operation in the manual mode, in which the operator sends commands to the equipment.

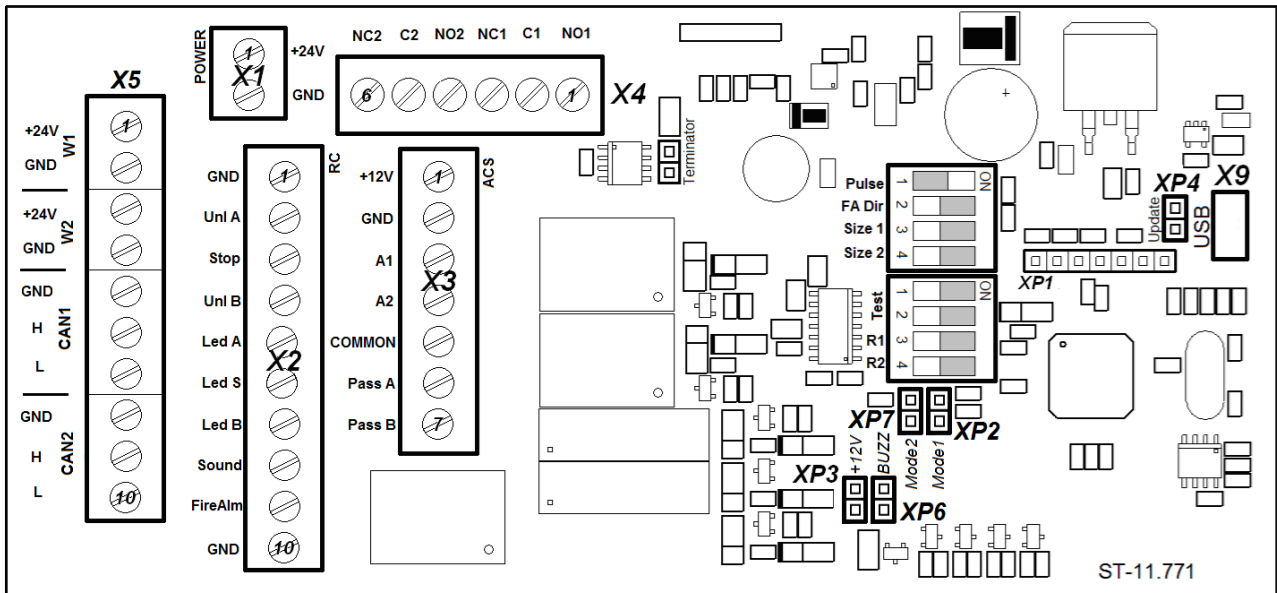
The RC front panel features three control buttons for sending commands. The middle **STOP** button sends the *Passage denial* command. The **LEFT** and **RIGHT** buttons serve to open the passage in the chosen direction. LED passage direction status indicators are located above the buttons. The red *Stop* indicator shows that both passage directions are closed. The available operation commands and RC panel indication for pulse and potential control modes are listed in Tables 7 and 8 respectively.



**Figure 8. Overall view and dimensions of the RC panel:**  
 1, 2, 3 – **LEFT, STOP, RIGHT** buttons for mode setting;  
 4, 6 – green *Left* and *Right* indicators; 5 – red *Stop* indicator

### 5.2.4 Control board

The speed gate control board (Fig. 9) is installed in the central post of the *Master* section. Remove the central post cover plate in order to access the board (see Sect. 8.8.1).



**Figure 9. Overall view of the control board**

The control board features a microcontroller, which processes the incoming control commands, transferred to the *Unlock A*, *Stop*, *Unlock B*, and *Fire Alarm* control inputs, monitors the status of optical sensors of swing panel rotation, and generates commands for the motor drive of the speed gate's swing panels on the basis of the data received.

The microcontroller also generates signals on the control board outputs: for indication on the RC panel (*Led A*, *Led Stop*, and *Led B* outputs), for external indication (*Light A* and *Light B* outputs), about the passage registration in the corresponding direction (*PASS A* and *PASS B*), about the alarm (*Alarm*).

The control board features:

**Terminal blocks to connect (see Table 1):**

- **X1 (Power)** – speed gate's power supply unit.
- **X2 (RC)** – control devices: the RC panel, wireless remote control, control outputs of the ACS controller, *Fire Alarm* device.
- **X3 (ACS)** – sirens and ACS controller inputs to the control board outputs.
- **X4** – remote indication blocks to the control board relay outputs.
- **X5** – DC and CAN connection cables from the boards of the swing panel motor drive of the *Slave* and *Master* sections.
- **X9** – *mini-USB* connector for updating built-in speed gate software.

**Connectors for jumper installation:**

- **XP1 (Program)** – service connector.
- **XP2 (Mode 1)** – connector that is not used. During operation, the jumper should be removed.
- **XP3 (+12V)** – connector for turning on LED indication on the control board. By default, the jumper is installed, which implies that indication is switched on.
- **XP4 (Update)** – connector for switching the control board to the built-in software update mode through the USB interface. The jumper is removed by default.
- **XP6 (BUZZ)** – connector for turning on a buzzer on the control board. Buzzer operation duplicates the sound indication of the RC panel and siren activation. The jumper is installed by default, which activates the buzzer.
- **XP7 (Mode2)** – connector for selecting the control mode for passage through the speed gate – normal or enhanced. Upon delivery, the jumper is installed, which corresponds to the normal control mode – in this mode, the “safe” zone, the user presence in which keeps the swing panels open, is the entire space between the speed gate sections. In enhanced control mode (the jumper is removed), the “safe” zone is limited to the width of the speed gate's swing panels.

**Switches:**

- **Pulse** – to switch the speed gate to the pulse control mode. By default, the switch is **ON**, which corresponds to the pulse operation mode of the speed gate.
- **FA\_Dir** – to choose the rotation direction of the swing panels in case an emergency passage unblocking (*Fire Alarm*) signal is sent. By default, the switch is **OFF**, which means that the swing panels open in the B direction.
- **Size1, Size2** – to set the size of the speed gate's swing panels (ref. to Table 2). By default, both switches are in the **OFF** position.
- **Test1** – not used. When operating, the switch must be **OFF**.
- **Test2** – for turning on LED indication on intrusion detector boards. By default, the switch is **OFF**, which means that indication is switched off.
- **R1** – for turning on the *Automatic opening in the selected direction* mode (Sect. 8.7). By default, the switch is turned **OFF** (Table 3).
- **R2** – for switching the speed gate to the training mode (Section 8.6) if the **R1** switch is in the **OFF** position, or for selecting the granted passage direction in the *Automatic opening in the selected direction* mode if the **R1** switch is in the **ON** position. By default, the switch is turned **OFF** (see Table 3).

**Table 1. Contact functions of terminal blocks of the control board**

Terminal block	No.	Contact	Function
<b>X1 (Power)</b>	1	+24V	External power supply connection
	2	GND	
<b>X2 (RC)</b>	1	GND	General
	2	Unlock A	A direction control input
	3	Stop	Passage denial control input
	4	Unlock B	B direction control input
	5	Led A	A direction indication output on the RC panel
	6	Led Stop	Passage denial indication output on the RC panel
	7	Led B	B direction indication output on the RC panel
	8	Sound	RC panel sound signal output
	9	Fire Alarm	Control input for emergency passage unblocking
	10	GND	
<b>X3 (ACS)</b>	1	+12V	+12V output for power supply to additional devices ( <u>max. 0.5 A</u> )
	2	GND	General
	3	Alarm1	Siren connection output
	4	Alarm2	
	5	Common	Common for <i>PASS A</i> and <i>PASS B</i> outputs
	6	PASS A	<i>PASS A</i> relay contact (passage in the A direction)
	7	PASS B	<i>PASS B</i> relay contact (passage in the B direction)
<b>X4</b>	1	NO1	Normally open contact of the <i>Light A</i> output
	2	C1	Common contact of the <i>Light A</i> output
	3	NC	Normally closed contact of the <i>Light A</i> output
	4	NO2	Normally open contact of the <i>Light B</i> output
	5	C2	Common contact of the <i>Light B</i> output
	6	NC2	Normally closed contact of the <i>Light B</i> output

**Table 2. Positions of the *Size1* and *Size2* switches according to the swing panel type**

Swing panel model	Switch position	
	Size1	Size2
<b>ATG-300</b>	ON	OFF
<b>ATG-300H</b>	ON	ON
<b>ATG-425, ATG-475</b>	OFF	OFF

**Table 3. Speed gate operation modes in different positions of the R1 and R2 switches**

Switch position		Mode
R1	R2	
OFF	OFF	The training and <i>Automatic opening in the selected direction</i> modes are turned off
OFF	ON	The training mode is switched on (Sect. 8.6)
ON	OFF	The <i>Automatic opening in the selected direction</i> mode is switched on in the A direction (Sect. 8.7)
ON	ON	The <i>Automatic opening in the selected direction</i> mode is switched on in the B direction (Sect. 8.7)

### 5.2.5 Control signal parameters

Passage through the speed gate is controlled by sending control signals to the *Unlock A*, *Stop*, and *Unlock B* inputs. The control signal is **sending a low-level signal** to the *Unlock A*, *Stop*, and *Unlock B* contacts relative to the *GND* contact. A normally open relay contact or circuit with an open collector output can serve as a control element (Fig. 10 and 11).

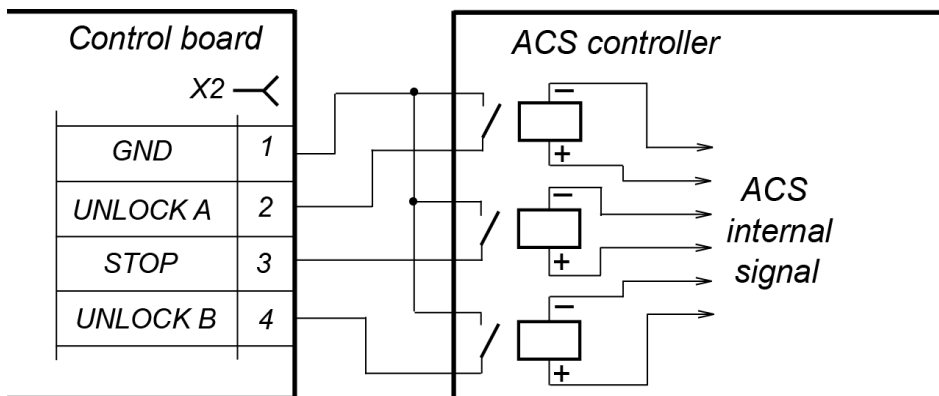


Figure 10. The external device’s control elements – normally open relay contact

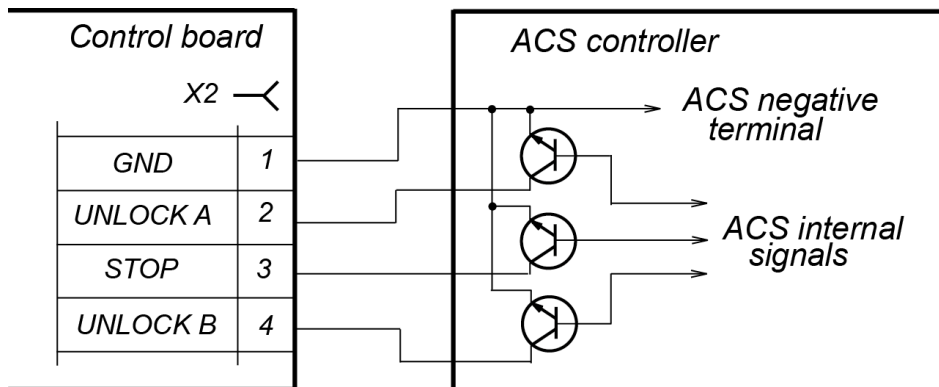


Figure 11. The external device’s control elements – open collector output circuit

The emergency unlocking of the speed gate is enabled by sending a control signal to the *Fire Alarm* input. The control signal is **removal of a low-level signal** from the *Fire Alarm* contact in relation to the *GND* contact. A normally closed relay contact or circuit with an open collector output can serve as a control element. In this case, all other incoming control commands transmitted to other inputs are ignored. When removing the control signal, i.e. sending a low-level signal to the *Fire Alarm* contact in relation to the *GND* contact), the *Passage denial* command is automatically sent to the speed gate, and its swing panels get closed.



**Note:**

Use 1 kOhm resistors connected to a +3.3 V voltage plane to generate a high-level signal on all input contacts (*Unlock A*, *Stop*, *Unlock B*, *Fire Alarm*).

The control element shall ensure the following characteristics of the signals:

control element – relay contact:

- minimum commutation current ..... max. 4 mA
- closed contact resistance (including the connection cable resistance) ..... max. 200 Ohm

control element – open collector output circuit:

- closed contact voltage (low-level signal, on the control board input) ..... max. 0.8 V

### 5.2.6 Control modes

There are two speed gate control modes, namely, pulse and potential. In both modes, the speed gate is controlled by sending commands (i.e. control signal combinations) to the *Unlock A*, *Stop*, and *Unlock B* control inputs and to a special *Fire Alarm* control input. The control command sending algorithm changes depending on the chosen mode.

The control mode is chosen by the **Pulse** switch on the speed gate control board (Fig. 9). Upon delivery, the switch is turned **ON**, which activates the pulse control mode of the speed gate.





**Attention!**

You may change positions of the switches only when the speed gate is turned off.

Shift the switch to the **OFF** position to switch the speed gate to the potential control mode. The control mode will be changed after the speed gate is switched on.

**Pulse control mode**

The mode is used to control the speed gate via the RC panel, wireless remote control, and ACS controller whose outputs support the pulse control mode. The speed gate operation in pulse control mode is described in Table 7.

The control signal duration when sending the control command to control inputs must amount to at least 100 ms. By default, the passage waiting time totals 8 seconds and does not depend on the control signal (pulse) duration.

The control command sending algorithm, which is a combination of control signals, is given in Appendix 1. A control command is an active front of the control signal (signal transition from a high level to a low level) at any of the control inputs (*Unlock A*, *Unlock B*, and *Stop*), in case there are corresponding signal levels at other inputs.



**Note:**

If control signals are sent from the RC panel / WRC device, the signal's active front is enabled by pressing a relevant button on the RC panel. The pressed state of the button corresponds to a low level of the signal; and the unpressed state corresponds to a high level of the signal.

**Potential control mode**

The mode is used to control the speed gate via the ACS controller whose outputs support the potential control mode. The speed gate operation in potential control mode is described in Table 8.

The control signal duration when sending a control command to control inputs must amount to at least 100 ms. The passage waiting time is equal to the control signal duration, i.e., if, by the time of passage in the permitted direction, there is a low-level signal at the input of this direction, then the speed gate remains open in this direction.

The control command sending algorithm is given in Appendix 2. Upon sending a low-level signal to the *Stop* input, both directions are locked for as long as it is active regardless of signal levels at the *Unlock A* and *Unlock B* inputs. Upon removing a low-level signal from the *Stop* input, the directions shift to the modes according to signal levels at the *Unlock A* and *Unlock B* inputs.



**Note:**

When the speed gate is operated from the ACS controller, a high level of the control signal corresponds to open contacts of the controller output relay or to the closed output transistor. A low level of the control signal corresponds to closed contacts of the controller output relay or to the open output transistor.

**5.2.7 Speed gate operation algorithm**

The speed gate operation algorithm in pulse control mode in case of a single passage in one of the directions:

1. A command (control signal combination) to allow a single passage in one of the directions is sent from the control device (RC panel, WRC, ACS controller) to the control board inputs.
2. The microcontroller on the control board processes the received combination of signals and generates a command for the swing panels' motor drive to open the passage zone. The **Unlocked state holding time** (8 seconds by default) countdown begins.
3. The speed gate's swing panels open in the chosen direction. The user can pass through the speed gate in the chosen direction.
4. When the user enters the passage zone, the fact of passage is recorded. One of the relay outputs, *PASS A* or *PASS B*, depending on the passage direction, is activated for 80 ms. The user's position in the passageway is monitored by the intrusion detectors.



**Note:**

In order to prevent user contact with the speed gate's swing panels, a "safe" zone is allocated inside the passage zone. When the user is in this area, the movement of the

swing panels (opening or closing) is blocked. In the normal control mode (**MODE2** jumper is installed, by default), the entire passage zone of the **ST-11** speed gate is covered; in the enhanced control mode (**MODE2** jumper is removed), the “safe” zone is limited by the width of the installed swing panels.

5. After the user passes through the open swing panels and gets into a safe zone (zone, in which it is impossible to come into contact with the swing panels), the control board microcontroller sends a command for the motor drive to close the swing panels. The swing panels get closed.
6. If, while the user is moving through the passage zone, another user’s passage is authorized **in the same passage direction**, the swing panels will not get closed, and the new user will be able to follow the first one immediately.
7. If, while the user is moving through the passage zone, another user’s passage is authorized **in the opposite passage direction**, then, as soon as the first user passes through the speed gate, its swing panels will be closed and open in the opposite direction for passage of the second user.



**Note:**

In order to increase the throughput rate, arrangement of separate passage zones for each direction is recommended.

8. If the user does not enter the passageway during the **Unlocked state holding time**, the swing panels will block the passage zone.
9. After the passage is completed, and the swing panels are closed, the speed gate is ready for another passage.

In potential speed gate control mode, the control signal can be removed after receiving a signal from the *PASS* output for the same direction.

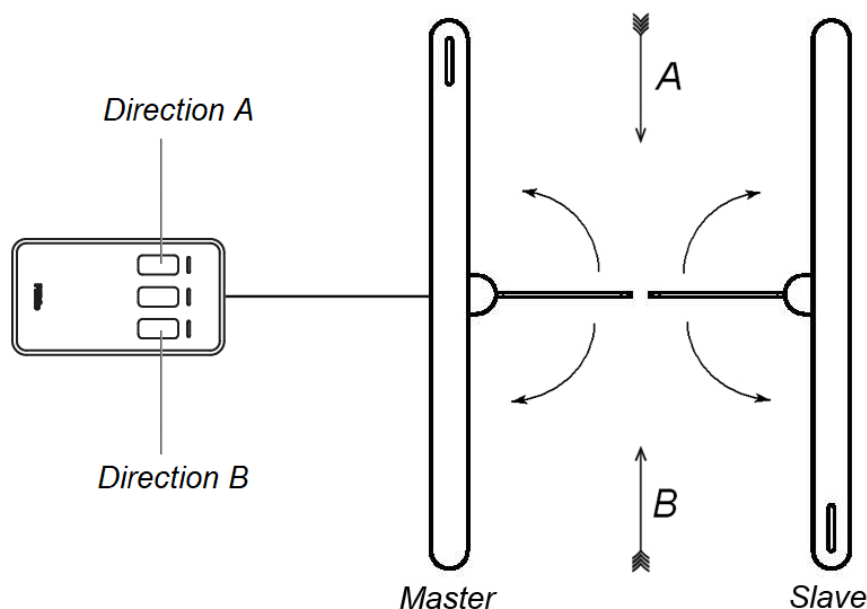
### 5.3 Speed gate control devices

The speed gate can be controlled through the following devices: the RC panel / WRC; ACS controller, *Fire Alarm* device. These devices can be connected to the speed gate separately, simultaneously (in parallel) or in any combination with each other.

In case several control devices are connected to the speed gate simultaneously, their control signals might overlap. In this case, the speed gate will operate according to the command generated by the signal combination (Appendixes 1 and 2).

#### 5.3.1 RC panel connection

The RC panel is connected with a flexible multicore cable to the *Unlock A*, *Stop*, *Unlock B*, *Led A*, *Led Stop*, *Led B*, *Sound*, and *GND* contacts of the **X2** terminal block according to the speed gate connection layout (Fig. 18).



**Figure 12. Standard RC panel orientation in respect of speed gate sections**

The standard RC-panel orientation in respect of sections is shown in Fig. 12. If the operator's workplace is located on the opposite side relative to the *Master* section, it will be more convenient to swap the RC-panel wires that are connected to the *Unlock A* and *Unlock B* contacts, as well as to *Led A* and *Led B* respectively (Table 4).



**Note:**

- When the speed gate operates as part of an ACS, it is recommended that the RC panel should be connected to the ACS controller in accordance with its operational documentation.
- The WRC is connected to the *Unlock A*, *Stop*, *Unlock B*, and *GND* contacts of the **X2** terminal block and to the +12V contact of the **X3** terminal block.

**Table 4. Connection of RC-panel cable wires to the X2 terminal block**

No.	Contact	RC panel orientation	
		Standard	Reverse
1	<i>GND</i>	black	black
2	<i>Unlock A</i>	white	green
3	<i>Stop</i>	blue	blue
4	<i>Unlock B</i>	green	white
5	<i>Led A</i>	yellow	red
6	<i>Led Stop</i>	orange	orange
7	<i>Led B</i>	red	yellow
8	<i>Sound</i>	brown	brown

**5.3.2 Fire Alarm device**

Connect the *Fire Alarm* emergency passage unblocking device to the control board's *Fire Alarm* input (*Fire Alarm* and *GND* contacts of the **X2** terminal block) according to the speed gate connection layout (Fig. 18).

If the *Fire Alarm* input is not used, a jumper wire needs to be installed between the *Fire Alarm* and *GND* contacts of the control board. This jumper is installed by default.

When a control signal is applied to the *Fire Alarm* input and held for at least 2 seconds<sup>1</sup>, the speed gate switches to the *Fire Alarm* mode. In this mode, the following operations take place:

- The speed gate's swing panels open in the direction chosen with the **FA\_Dir** switch (Fig. 9).
- Green passage permission indicators of the top cover and central post indication blocks switch on in the flashing mode with an interval of 1.25 sec. simultaneously for both directions.
- All the incoming speed gate control commands are ignored.

After the *Fire Alarm* signal is removed, the swing panels of the speed gate will be open for another 3 sec., after which the swing panels will close, and the speed gate will return to normal operation.

If a control signal is received at the *Fire Alarm* input while passage is in the progress, the swing panels remain open in this direction until the signal is removed.

**5.3.3 Operation via ACS**

Functioning as part of the ACS, the speed gate can serve as an operating device. The speed gate can be equipped with built-in proximity card readers under the section top cover.

ACS controller outputs are connected to the *Unlock A*, *Stop*, *Unlock B*, and *GND* contacts of the **X2** terminal block. ACS controller inputs are connected to the *PASS A*, *PASS B*, and *Common* contacts of the **X3** terminal block. The connection is performed in accordance with the speed gate connection layout (Fig. 18).

<sup>1</sup> If the duration of the *Fire Alarm* signal is less than 2 seconds, the speed gate will not switch to the *Fire Alarm* mode and will remain in normal operation mode.

## 5.4 Optional devices connected to the speed gate

The speed gate control board features the following outputs for connection of optional devices:

- *PASS A*, *PASS B* – for connection to ACS controller inputs (Sect. 5.4.1).
- *ALARM* – for siren connection (Sect. 5.4.2).
- *Light A* and *Light B* – for connection of remote indication blocks (Sect. 5.4.3).

### 5.4.1 PASS outputs

The connection to the *PASS A* and *PASS B* relay outputs is performed through the *Pass A*, *Pass B*, and *Common* contacts of the **X3** terminal block on the control board in accordance with the speed gate connection layout (Fig. 18).

The relays have normally open contacts. The *Common* relay contact is not connected to the negative terminal of the speed gate's power supply unit. In the normalized state, no voltage is applied to the relay coil.

The outputs are activated upon registration of passage through the speed gate in the corresponding direction. During the activation process, voltage is applied to the relay coil, and relay contacts get closed. Voltage supply to the relay coil is indicated by lighting up of the red LED light on the control board near the corresponding relay (if the jumper is installed on the **XP3 (+12V)** connector of the control board).

The output stages – relay contacts (Fig. 13) with the following signal characteristics:

maximum commutation DC voltage .....	42 V
maximum commutation current .....	0.25 A
closed contact resistance .....	max 0.15 Ohm

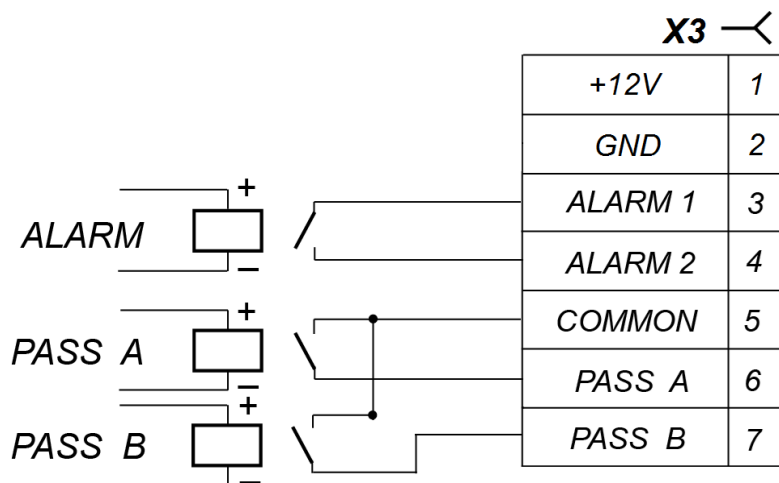


Figure 13. Output stages for PASS A, PASS B, and Alarm

### 5.4.2 Siren

A siren is connected to the *ALARM* relay output on the control board through the *Alarm 1*, *Alarm 2*, *GND*, and *+12V* contacts of the **X3** terminal block of the control board in accordance with the speed gate connection layout (Fig. 13, 18).

In the normalized state, no voltage is applied to the relay coil, and the relay contacts are open. The output is activated when intrusion detectors register an unauthorized passage, as well as when the speed gate switches to the *Emergency* mode (Section 9.4). During the activation process, voltage is supplied to the relay coil, and relay contacts get closed. Voltage supply to the relay coil is indicated by lighting up of the red LED light on the control board near the corresponding relay (if the jumper is installed on the **XP3 (+12V)** connector of the control board).

The output stage includes relay contacts (Fig. 13) with the following signal characteristics:

maximum commutation DC voltage .....	42 V
maximum commutation current .....	0.25 A
closed contact resistance .....	max 0.15 Ohm

The maximum consumption current of the siren, when connected to the *+12V* contact of the **X3** terminal block on the control board, must not exceed 0.5 A.

### 5.4.3 Remote indication blocks

Remote indication blocks for corresponding passage directions are connected to the *Light A* and *Light B* outputs. The outputs have a full set of contacts: *NO* normally open, *NC* normally closed, and *C* common contacts. Connection to the outputs is performed through the corresponding contacts of the **X4** terminal block.

Upon indication of passage permission in the *A/B* direction, the *Light A / Light B* relay of the corresponding passage direction is activated (voltage is supplied to its coil), and it is normalized upon passage denial indication. Power supply to the relay coil can be determined by lighting up of the red LED light on the control board near the corresponding relay.

The output stages for *Light A* and *Light B* are relay changeover contacts (Fig. 14) with the following signal characteristics:

maximum commutation DC voltage .....	30 V
maximum commutation AC voltage .....	42 V
maximum commutation AC/DC current .....	3 A
closed contact resistance .....	max 0.15 Ohm

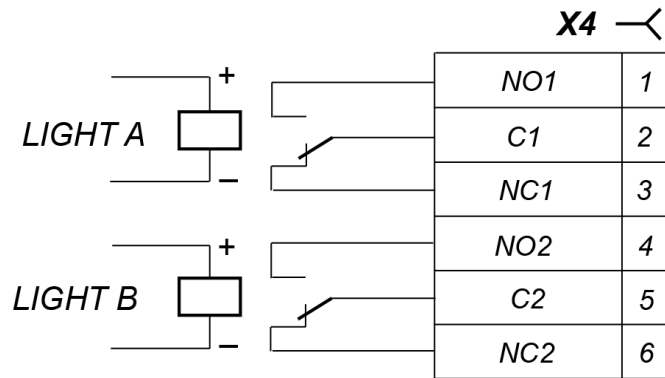


Figure 14. Output stages for Light A and Light B

## 6 MARKING AND PACKAGING

Each speed gate section has a marking label that can be found on the inside surface of the section top duct. To find the marking label, one needs to remove the section top cover (Sect. 8.8.6). The label identifies the product's name, serial number, and date of manufacture.

In addition, the *Master* section of the speed gate and the double-sided section have a sticker on the internal surface of the central post cover plate (2). Remove the post cover plate to access the sticker (Fig. 19). It shows the electrical connection layout of the speed gate similar to the one shown in Fig. 18.

The speed gate in the standard delivery set is packed in transportation boxes, which protect it from being damaged during transportation and storage. The number of boxes depends on the delivery set that has been ordered.

Dimensions of the transportation boxes:

<b>ST-11:</b> box with <b>ST-11/M</b> and <b>ST-11/S</b> sections .....	157×60×108 cm
<b>STD-11:</b> box with the double-sided section .....	157×35×108 cm
<b>STC-11, SDC-11</b> (set of section top covers) .....	139×15×19 cm
<b>ATG-300</b> (set of swing panels) .....	66×44×8 cm
<b>ATG-300H</b> (set of swing panels) .....	104×44×8 cm
<b>ATG-425</b> (set of swing panels) .....	66×56×8 cm
<b>ATG-475</b> (set of swing panels) .....	66×61×8 cm

Weight of the transportation boxes (gross):

<b>ST-11:</b> box with <b>ST-11/M</b> and <b>ST-11/S</b> sections .....	max. 145 kg
<b>STD-11:</b> box with the double-sided section .....	max. 105 kg
Box with <b>STC-11</b> (set of section top covers) .....	max. 19 kg
Box with <b>SDC-11</b> (top cover of the double-sided section) .....	max. 14 kg
Box with <b>ATG-300</b> (set of swing panels).....	max. 16 kg
Box with <b>ATG-300H</b> (set of swing panels) .....	max. 21 kg
Box with <b>ATG-425</b> (set of swing panels) .....	max. 19 kg
Box with <b>ATG-475</b> (set of swing panels) .....	max. 23 kg

## 7 SAFETY REQUIREMENTS

### 7.1 Installation safety

The speed gate shall be installed by the persons that have fully studied this Manual and have been instructed in safety, in compliance with general rules of electrical and installation works.

The power supply unit shall be installed in compliance with safety measures stipulated in its operational documentation.



#### **Attention!**

- All installation works may be performed only after the power supply unit is switched off and disconnected from the AC mains.
- Only serviceable tools may be used for installation.
- Unpacking and movement of sections, installation of the section top cover and swing panels, and replacement of filling glass are to be carried out by at least two professionals.
- Wearing protection gloves is obligatory! Housing details made of stainless steel may have sharp edges.
- During the installation, before the sections are fixed to the floor, be especially careful and focused and prevent them from falling down.
- Before the first speed gate power-up, make sure that its installation and all connections have been performed properly.

### 7.2 Operation safety

Observe general electrical safety rules when operating the speed gate.



#### **Attention!**

- Do not use the speed gate in conditions that do not comply with the requirements given in Sect. 2.
- Do not use the speed gate at the PS unit's voltage different from that specified in Sect. 3.

The power supply unit must be operated with observance of safety requirements specified in its operational documentation.

## 8 ASSEMBLY AND INSTALLATION

When installing the speed gate, observe the safety rules stipulated in Sect.7.1.

Proper installation is crucial to the performance and service life of the speed gate. Installation shall be carried out by at least two persons properly qualified as an installer and electrician. It is necessary to study this section carefully before the start of installation works and then follow the instructions specified herein.



#### **Attention!**

The manufacturer shall not be liable for any damage caused by improper installation and declines any claims arising thereof in case the installation is not carried out in compliance with the instructions provided in this Manual.

### 8.1 Installation details

To prepare the mounting surface, it is recommended that you should:

- mount the speed gate on a steady and level concrete (grade 400 or higher, strength class B22.5), stone or similar foundation with a thickness of at least 150 mm.
- level the mounting surface so that all the fixing points of the speed gate section lie in the same horizontal plane (check it using a level).
- apply embedded reinforcing elements with the minimum dimensions of 450×450×200 mm in case the speed gate has to be installed on a less steady foundation.



#### **Attention!**

When installing the speed gate sections, leave a gap of at least 70 mm between the section's rear panel and the wall in order to provide the possibility of removing the rear panel of the central post.

## 8.2 Tools and equipment required for installation

- 1.2÷1.5 kW electric hammer drill;
- hard alloy drill bit to create holes for anchor sleeves;
- floor chaser for cable ducts;
- PH2 Phillips-head screwdriver;
- S17 horn-type and socket wrenches;
- SW2, SW4, SW5 Allen keys;
- level;
- 2 m measuring tape;
- slide caliper.



### Note:

It is allowed to use other equipment and measuring tools provided that the equipment in use helps to comply with the required parameters.

## 8.3 Cable lengths

Cables that are used during the installation are listed in table 5.

**Table 5. Cables used during the installation**

No.	Equipment to be connected	Cable length, m, max.	Cable type	Cross-section, mm, min.	Example
1	Power supply unit	10	Twin cable	1.5	AWG 15; HO5VV-F 2×1.5
		20	Twin cable	2.5	AWG 13; HO5VV-F 2×2.5
2	- Fire Alarm device - Optional equipment	30	Twin cable	0.2	RAMCRO 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

The installation procedure is described with due consideration for recommendations stipulated in Sect. 8.1. Installation tools are listed in Sect. 8.2. The item numbers are specified in accordance with Fig. 6 and 7. The electrical connection layout of the speed gate is shown in Fig. 18. The types of cables used during installation are listed in Table 5. An example of the connection layout for the speed gate and double-sided sections with extra passage zone arrangement is shown in Fig. 17.

Follow this order to install the speed gate:

1. Install the PS unit in the required place in accordance with the instruction given in its operational documentation.



### Attention!

- While moving the speed gate's section, it is forbidden to hold it by the top cover.
- Speed gate sections may be installed and fixed only after all necessary cables have been laid in cable ducts and inside the sections.
- Be careful while removing the parts of the speed gate sections before fixing the sections on the mounting surface. Prevent the sections from falling down and their parts from being damaged.

2. Determine the installation locations for the *Master* and *Slave* sections and for double-sided sections if needed. In particular, it is necessary to mind the rule for mutual arrangement of sections: the *Master* section panel (side of the double-sided section) should always be placed opposite to the *Slave* section panel (side of the double-sided section).
3. In accordance with the layouts presented in Fig. 15-16 and with due consideration for the checkpoint design, mark and drill holes for anchor sleeves on the mounting surface to fix the speed gate and double-sided sections<sup>1</sup>. Insert the anchor sleeves into the holes so that they are flush with the floor surface.

<sup>1</sup> Use the cardboard template (included in the **ST-11** set) to mark holes; it is also used to mark holes for the **STD-11** double-sided sections.

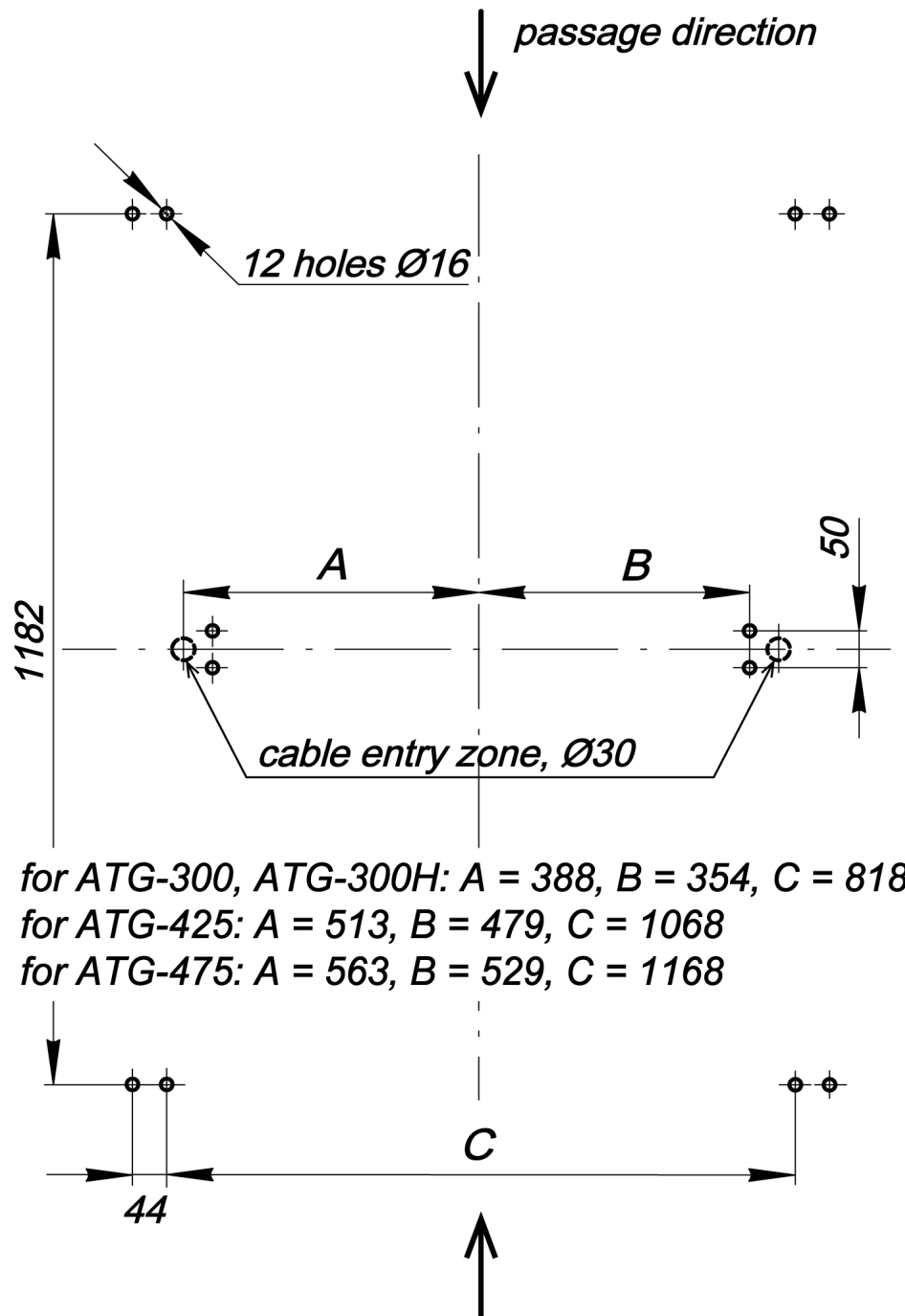


Figure 15. Marking layout for installation of the speed gate<sup>1</sup>

<sup>1</sup> The hole size in the layout is specified for anchors of the PFG IH 10 SORMAT type; when using other types of anchors, it is necessary to make holes with a diameter and depth required for those.



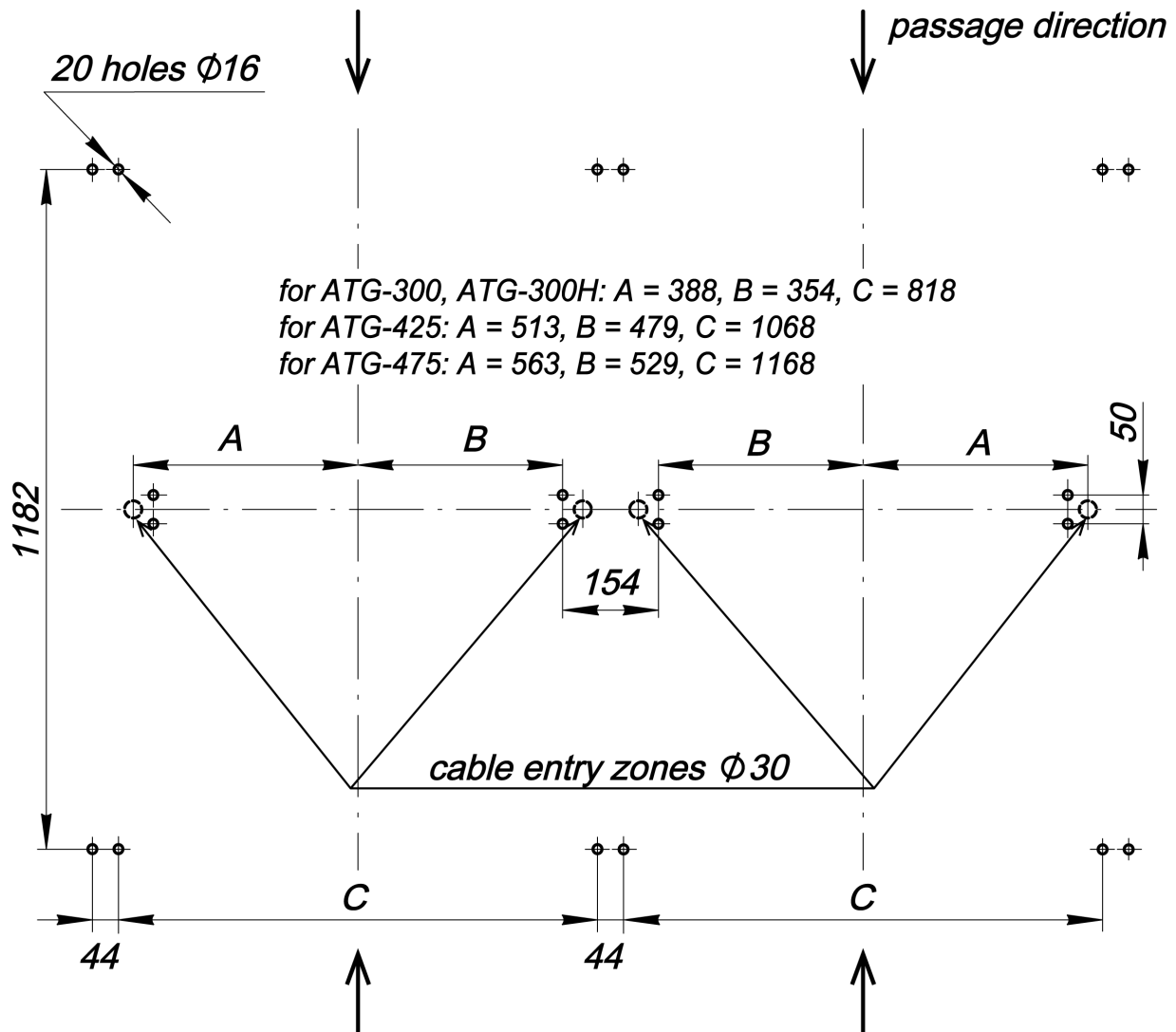


Figure 16. Marking layout for installation of the speed gate and double-sided section<sup>1</sup>

4. Prepare cable ducts in the floor:
  - Ducts for cabling from external devices (PS unit, RC panel or ACS controller, *Fire Alarm* device etc.) – to holes for entry into the *Master* section and for entry into the *Master* side of the double-sided section;
  - Ducts that link cable entry holes of the opposite sections (sides of the double-sided section) of one passage zone – for laying DC and CAN connection cables.



**Attention!**

Passage zones that are limited by one-sided sections and / or sides of double-sided sections are standalone functional devices that are not connected to each other directly. The *Master* and *Slave* sides of one double-sided section are electrically independent as they belong to different passage zones.

5. In the cable ducts, lay cables from external devices to installation locations of the sections. In addition, lay a flexible conduit in the cable duct between the opposite sections (sides of the sections) for each passage zone. The flexible conduit is used for pulling DC and CAN cables from the *Slave* section (side of the section) to the *Master* section (side of the section).



**Note:**

When it is impossible to use a flexible conduit for cabling, then, if necessary, DC and CAN cables can be laid without delay, before one starts installing the sections. These cables are located under the cover plate at the bottom of the central post of the *Slave* section (side of the section). To do so, it is necessary to unpack the *Slave* section, remove the cover plate from the central post (see Fig. 19), take out DC and CAN cables, and disconnect them from the drive control board. The cable core ends are marked with numbers that correspond to the connection layout (Fig. 18).

6. Unpack the *Master* section. Do not work alone! Carefully take the section out of the box by holding it by the top duct.
7. Unpack the section top covers (packed in a separate box).
8. Dismantle parts of the speed gate section as described:
  - Remove the central post cover plate (2) (Fig. 19, Sect. 8.8.1).
  - Remove the front panels of both side posts (10) (Fig. 20, Sect. 8.8.2).
9. Install the speed gate section on the anchor sleeves. Do not work alone!
10. Pull cables into the post through the cable entry hole located in the base of the *Master* central post: from the PS unit (19), RC panel (18), *Fire Alarm* device (20), and from additional equipment. Pull the DC (16) and CAN (17) cables from the *Slave* section (side of the section) or a flexible conduit for their cabling in the same manner.
11. Fix the section on the mounting surface by using a socket ratchet wrench and six M10 bolts with washers. At the same time, ensure the vertical position of the speed gate section by using a level. The section must not deviate from the vertical in the longitudinal plane by more than 0.5°. It is allowed to use mounting gaskets.

**Note:**

Paragraphs 12-16 are applicable in case additional **STD-11** double-sided sections are installed.

12. Unpack and install the double-sided section. Perform actions described in paragraphs 7 - 9 (for both sides of the section). Place the double-sided section so that the *Slave* side is located opposite the installed *Master* section.
13. Take the DC and CAN connection cables out of the central post of the double-sided section from the *Slave* side (if they have not been laid within the cable duct earlier). Lead them through the cable entry hole that is located in the post base plate. Pull cables using a previously laid flexible conduit through the cable duct to the *Master* section.
14. Pull cables for controlling the second passage zone inside the central post through the cable entry hole located in the base of the double-sided section's central post (from the *Master* section side): from the PS unit, from the RC panel or ACS controller, from the *Fire Alarm* device, and from additional equipment. Route the DC (16) and CAN (17) cables from the *Slave* section (side of the section) or a flexible conduit for their cabling in the same manner.
15. Ensure the vertical position of the double-sided section and fix it on the mounting surface by using eight M10 bolts with washers (see paragraph 11).
16. Install other double-sided sections if needed (paragraphs 12 - 15).
17. Unpack and install the speed gate's *Slave* section. Proceed as described in paragraphs 7 - 9.
18. Take the DC and CAN connection cables out of the *Slave* section's central post (if they have not been laid within the cable duct earlier). Lead them through the cable entry hole that is located in the post base plate. Pull cables with a previously laid flexible conduit through the cable duct to the *Master* section (side of the section).
19. Ensure the vertical position of the section and fix it on the mounting surface (see paragraph 11).
20. Connect cables to the control board of the first passage zone according to the speed gate's electrical connection layout (see Fig. 9 and Fig. 18). The control board is located at the bottom of the *Master* section's central post.

**Note:**

DC (No. 2 in the layout) and CAN (No. 4) connection cables are to be connected to the **X5** terminal block of the *Master* section control board and to the **X1** terminal block of the *Slave* section drive board in accordance with their core marking (see Fig. 18).

21. If necessary, install access card readers in the top duct of the section (Fig. 20).

**Attention!**

Access card readers are not included in the standard delivery set of the speed gate!

The selection of the type of readers, their purchase, and installation into the product are carried out by the customer (installer) in accordance with the checkpoint design and the

characteristics of the access control system and management controller. It is possible to outfit the product with readers manufactured by **PERCo** (**IR13**, **IR19**, **IR19 OEM**) or third-party manufacturers.

Readers must meet the following requirements:

overall dimensions (length × width × height) ..... max. 155×68×28 mm  
 ID reading range ..... min. 40 mm,

provided that the reader is located as close to the top cover as possible.

Use double-sided adhesive tape to fix readers and, if needed, non-metal pads for the reader to be placed as close to the top cover as possible in order to increase its operating range. Carefully route reader cables through the top duct and the central post to the ACS controller cable inlet by using standard slots in the section housing parts. Cables must not be laid between or near the holes used for fastening the section top cover. This will protect the cables from damage during installation of the top cover. Use self-adhesive cable tie mounts for cable fastening. It is prohibited to fix cables to the internal wiring cables and to the intrusion detector boards. It is also prohibited to route cables near the boards where the detectors are located.

22. Unpack the glass swing panels (4) and mount them (Fig. 21, Sect. 8.8.3).
23. Mount swing panel cover plates (3) from the installation kit (Fig. 21, Sect. 8.8.4).
24. Mount front panels (10) of the side posts in the required places (Sect. 8.8.2). When installing front panels with indication boards, BE SURE TO make certain that markers on the panels and on the section match with each other (Fig. 20). After installation, make sure that the top edges of the panels are flush with the section housing.
25. Mount central post indication blocks (5) (see Fig. 22, Sect. 8.8.5) (included in the delivery set).
26. Install section top covers (6) (see Fig. 23, Sect. 8.8.6).
27. Use switches on the control board of the *Master* section (side of the section) (see Sect. 5.2.4) in order to:
  - Set the operation mode of the speed gate by using the **Pulse** switch.
  - Select the rotation direction of the swing panels as an alarm reaction to the *Fire Alarm* device. Use the **FA Dir** switch.
  - Set the size of the swing panels that will be mounted in this passage zone by using the **Size1** and **Size2** switches (see Table 2).
28. Perform a test run as described in Sect. 9.1.
29. If it is required to adjust the position of the swing panels relative to each other, switch the speed gate to the training mode, then close the swing panels manually as described in Sect. 8.6.
30. Check the correct operation of the speed gate by sending control commands from the RC panel (see Sect. 9.2, 9.3).
31. Execute the same operations as specified in paragraphs 20 – 30 for all other passage zones of the speed gate.
32. Mount central post cover plates (2) (Sect. 8.8.1).

The speed gate is ready for operation once its installation and testing are finished.

## 8.5 Electrical connection layout of the speed gate

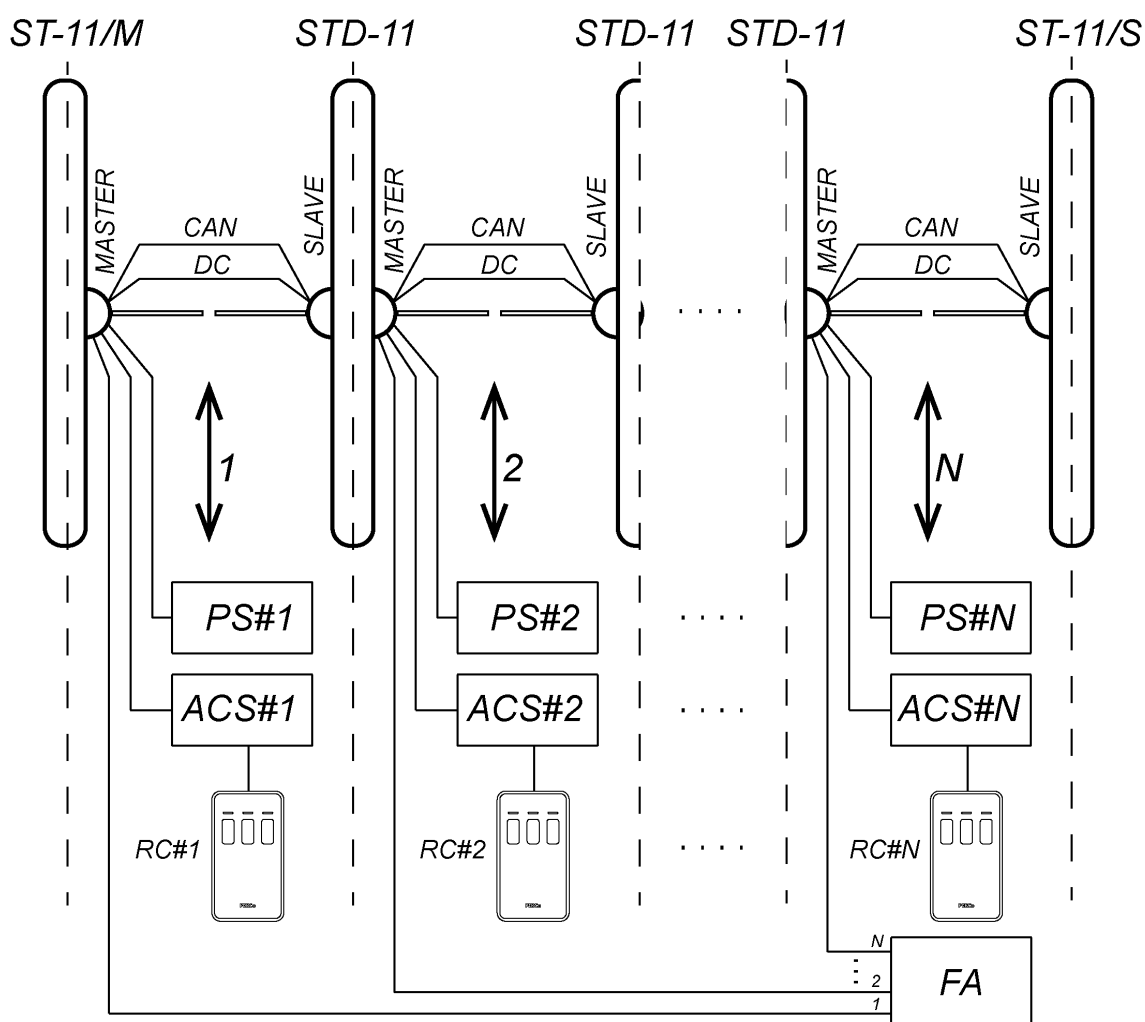
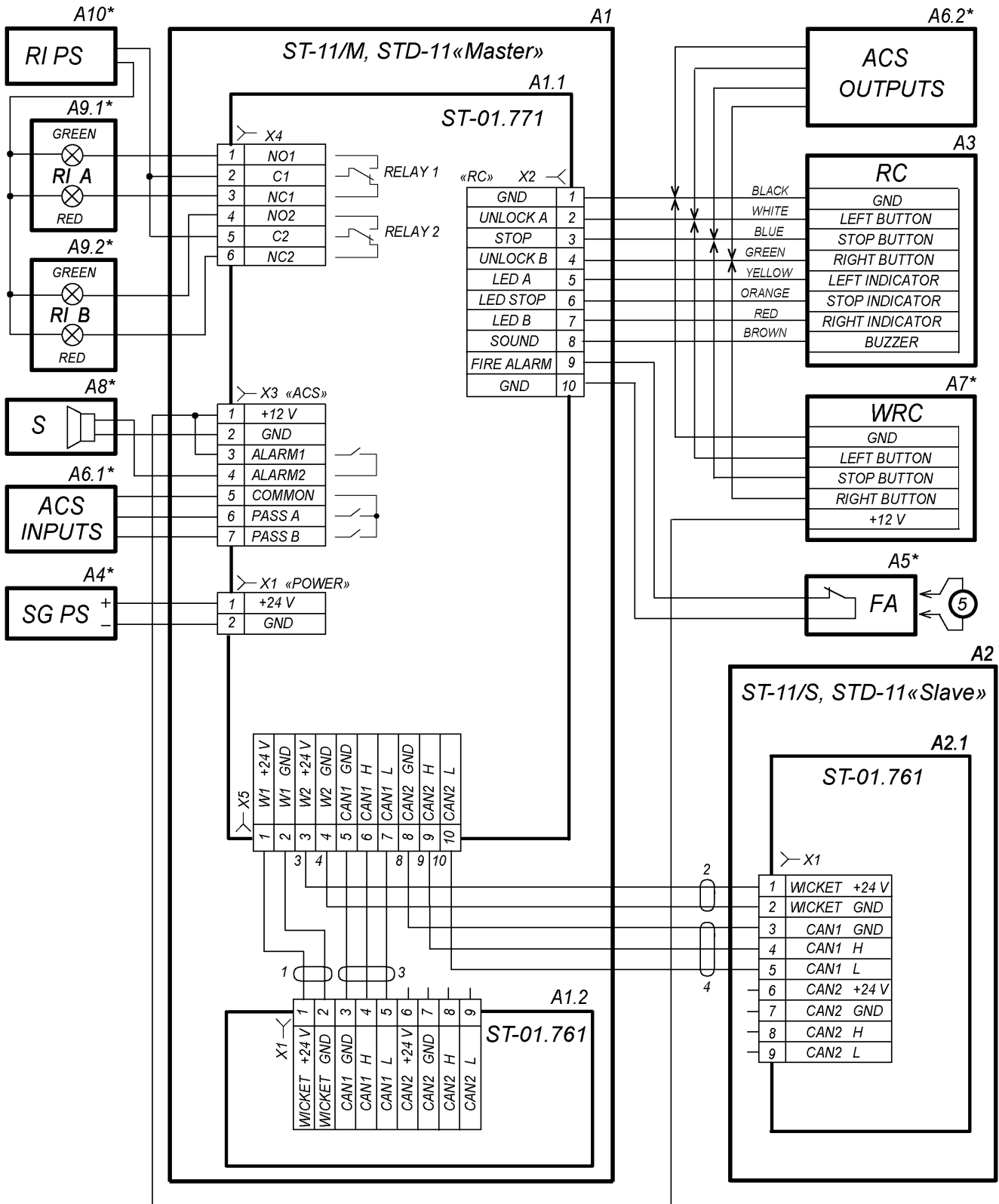


Figure 17. Connection layout for the ST-11 Speed gate and STD-11 Double-sided sections for arrangement of a checkpoint with several passage zones

Table 6. List of the elements of the speed gate's electrical connection layout

Legend	Name	Nr, pcs
A1	Master section (section side)	1
A1.1	Control board	1
A1.2	Motor drive board, Master section (section side)	1
A2	Slave section (section side)	1
A2.1	Motor drive board, Slave section (section side)	1
A3	RC panel	1
A4 <sup>1</sup>	Speed gate's PS unit	1
A5 <sup>1</sup>	Fire Alarm signal sending device	1
A6.1 <sup>1</sup> , A6.2 <sup>1</sup>	ACS controller	1
A7 <sup>1</sup>	Wireless remote control	1
A8 <sup>1</sup>	12V DC siren	1
A9.1 <sup>1</sup> , A9.2 <sup>1</sup>	Remote indication block	2
A10 <sup>1</sup>	Power supply unit of remote indicators	1
1, 2	DC connection cable	2
3, 4	CAN connection cable	2
5	Jumper wire in case there is no Fire Alarm device (A5). Installed by default.	1

<sup>1</sup> The equipment is not included in the standard delivery set.



Attention! The Slave section (side of the section) must be powered ONLY by the ST-01.771 board of the Master section with the use of standard DC cable No. 2. Standard CAN cable No. 4 may be extended only to a maximum total length of 5 m; otherwise, correct operation of the product is not guaranteed!

**Figure 18. Electrical connection layout of the speed gate<sup>1</sup>**

<sup>1</sup> Layout elements are listed in table 6.

The equipment marked with an asterisk (\*) is not included in the standard delivery set.

When the speed gate operates as part of the ACS, it is recommended that its RC panel (A3) should be connected to the ACS controller in accordance with the controller's operational documentation.

## 8.6 Training mode

The mode allows the initial (closed) position of the speed gate's swing panels to be regulated manually. Proceed as follows:

- 1 Turn off the speed gate's power supply unit.
- 2 Switch the **R2** switch to the **ON** position (the **R1** switch should be in the **OFF** position) on the control board.
- 3 Arrange the swing panels into the required initial position and align them in respect of each other.
- 4 Switch on the speed gate's power supply unit. The swing panel will make a search for the end positions and get back into the initial position. The swing panel position data will be registered in the control board memory.



### Note:

If, when in the training mode, the speed gate switches to the *Emergency* mode, this indicates the incorrect initial position of the swing panels. Turn off the speed gate's power supply unit in order to exit the *Emergency* mode. In order to continue with the training mode, install the swing panels into the initial (locked) position once again and turn on the speed gate's power supply unit.

- 5 Turn off the speed gate's power supply unit.
- 6 Switch the **R2** switch to the **OFF** position on the control board.
- 7 Switch on the speed gate's power supply unit. The swing panels will make a search for the end positions and get back into the initial (locked) position. The speed gate is ready for operation.

## 8.7 Automatic opening in the selected direction mode

This additional operation mode of the speed gate is used when it is required to organize free entry (or exit) provided that the swing panels are locked in the initial position and to prevent an unauthorized access in the opposite direction (e.g., at the checkpoint of the shop's salesroom etc.).

Operation modes of the speed gate can be selected with the use of the **R1** and **R2** switches on the control board (see Fig. 9 and Table 3).



### Attention!

Change the position of the switches only when the speed gate is turned off.

This operation mode allows arrangement of free passage through the speed gate in one preselected direction, when the swing panels automatically open before and close after the passage. For the direction selected for the *Automatic opening in the selected direction* mode, if the speed gate zone is not occupied for passage from the opposite direction, the green passage permission indicator is constantly lit, and the red passage denial indicator is lit for the other passage direction. If a passage from the opposite direction is authorized (from the RC panel, WRC device or ACS controller), the *Automatic opening in the selected direction* mode is turned off for the duration of this passage.

### Operation algorithm for this mode:

- 1) By default, the green passage permission indication is on in the *Automatic opening in the selected direction* mode in a free passage direction, and the red passage denial indication is on in the other direction. RC panel commands or ACS controller commands permitting passage in the direction set for the *Automatic opening in the selected direction* mode are ignored.
- 2) The intrusion detectors send a command to the speed gate controller to open the swing panels when a visitor walks through the passage zone in the direction selected for the *Automatic opening in the selected direction* mode. The swing panels open in this direction, and when the passage is completed, the intrusion detectors send a closing command to the controller, and the swing panels automatically close behind the user. The indication stays in its initial state.
- 3) When the passage is performed in the direction opposite to that selected for the *Automatic opening in the selected direction* mode, the operation algorithm is similar to the ordinary algorithm (Sect. 5.2.7). In case of such authorized passage, the *Automatic opening in the selected direction* mode is switched off for the passage duration (passage waiting period). If the *Free passage* mode is applied for this direction, then the *Automatic opening* mode is switched off the whole time while the *Free passage* mode is active.
- 4) All other cases such as simultaneous passage attempts in both directions are considered as abnormal, and in case of their occurrence, the controller will generate an emergency signal and will close the swing panels.

## 8.8 Assembly and disassembly of speed gate components



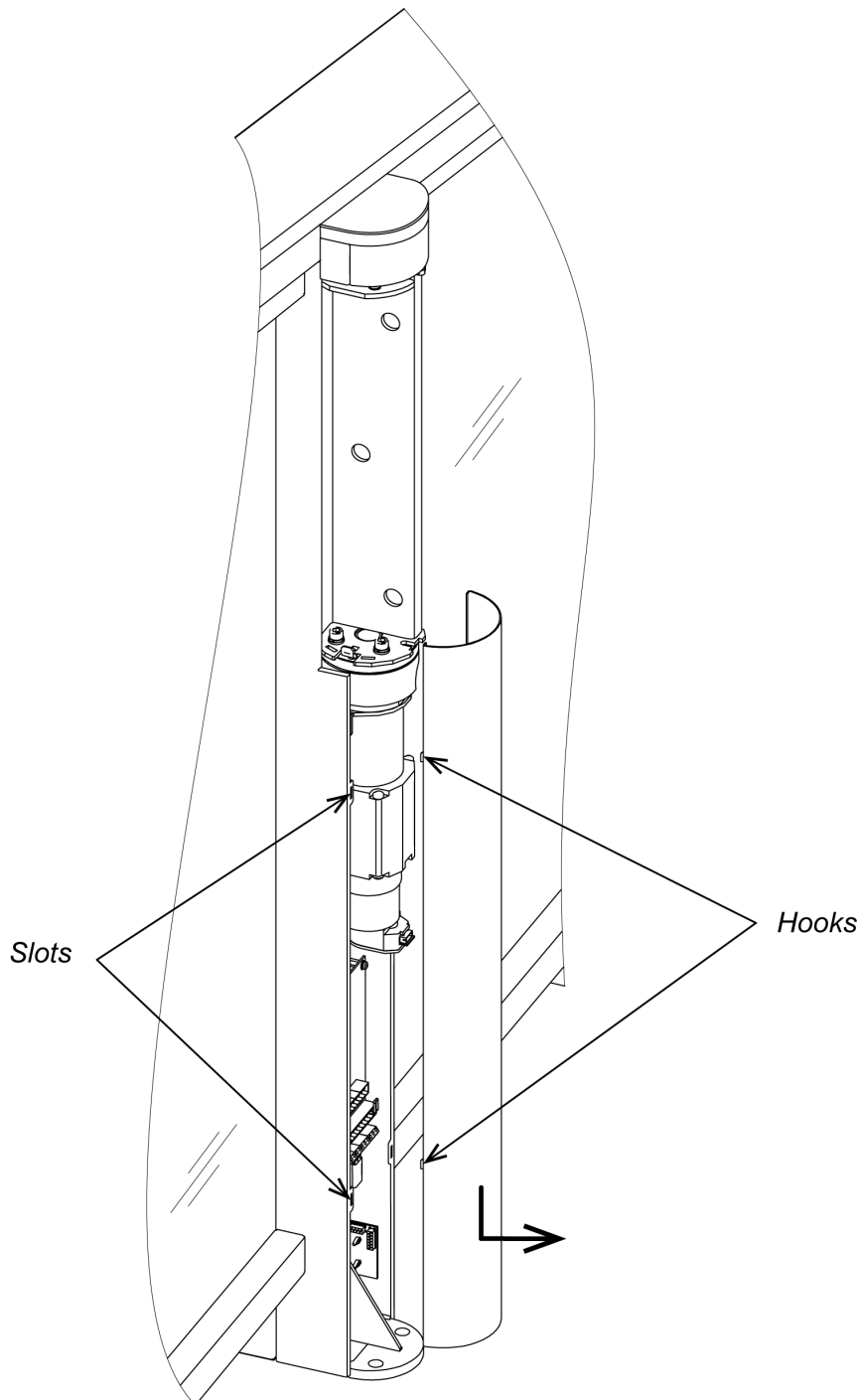
### **Attention!**

Speed gate components are made of polished stainless steel and glass. Be careful during the assembly; to prevent the components from falling and being damaged, place them on an even and steady surface with the outside facing upwards, and protect them from scratches.

### 8.8.1 Central post cover plate

To remove the central post cover plate (2), pull the cover plate down along the post and towards yourself, bringing the cover plate hooks out of slots in the central post (Fig. 19).

When installing the cover plate on the central post, press down on the cover plate, carefully insert all its hooks into the slots on the post housing, and release it. The cover plate should click into place driven by a spring-loaded foot located at the bottom on the inside of the cover plate.



**Figure 19. Removal of the central post cover plate**

### 8.8.2 Front panel of the side post

Remove the side post's front panel (10) by moving it down along the post and then pulling it towards yourself, which will bring the panel hooks from slots in the side post (Fig. 20). Be careful not to damage the connection cable! Disconnect the cable connector from the indication board.

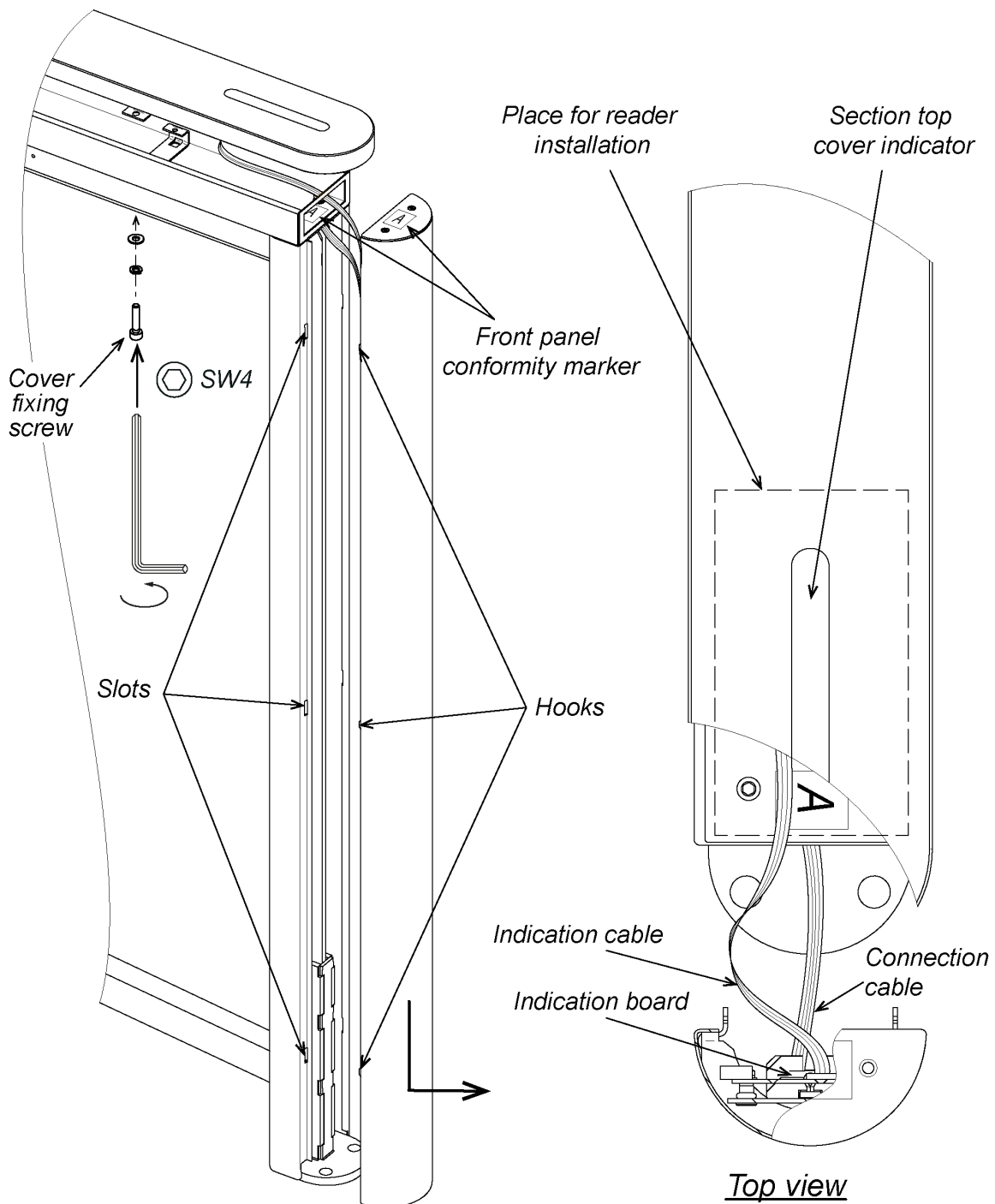


#### **Attention!**

When installing front panels with indication boards, BE SURE TO make certain that markers on the panels and on the section match with each other (Figure 20).

When installing the side post's front panel, press down on it, carefully insert all hooks of the cover plate into the slots of the post housing, and release it. The panel will click into place driven by a spring-loaded foot located at the bottom of the inside.

It is not necessary to take off the section top cover (6) before the installation (removal) of the side post's panel (see sect. 8.8.6).



**Figure 20. Removal of the front panel of the side post**  
(the dashed line shows the location of the reader)



### 8.8.3 Swing panel

Two people shall install and remove the swing panels (4). The swing panel is fixed to the rotary support in three places with M10×30 bolts, washers 10, plastic bushings, and M10 nuts (Fig. 21). Use S17 horn-type wrenches.

### 8.8.4 Swing panel cover plate

The swing panel cover plate (3) consists of two parts. In order to install the cover plate, proceed as follows:

1. Turn the rotary support of the swing panel in a clockwise direction as far as it goes.
2. Mount one of the cover plate components on the rotary support. To do this, mount the cover plate on the upper plate of the rotary support through the slots at the top of the cover plate. After that, shift the cover plate down to the end, inserting the cover plate's lower slot on a hook located at the bottom of the rotary support (Fig. 21).
3. Fix the installed part of the cover plate on the support with a PH2 Phillips-head screwdriver using two M4×10 screws with washers from the delivery set.
4. Turn the rotary support of the swing panel in a counterclockwise direction as far as it goes. Mount the second part of the cover plate on the rotary support likewise.
5. Visually check the gaps between the swing panel and its cover plates, between the swing panel cover plate and central post cover plate; if needed, loosen the M4×10 screws and adjust the bottom part of the swing panel cover plate. Tighten the screws.

The swing panel cover plate is removed in reverse order. Prior to this, remove the central post indication block (see Sect. 8.8.5).

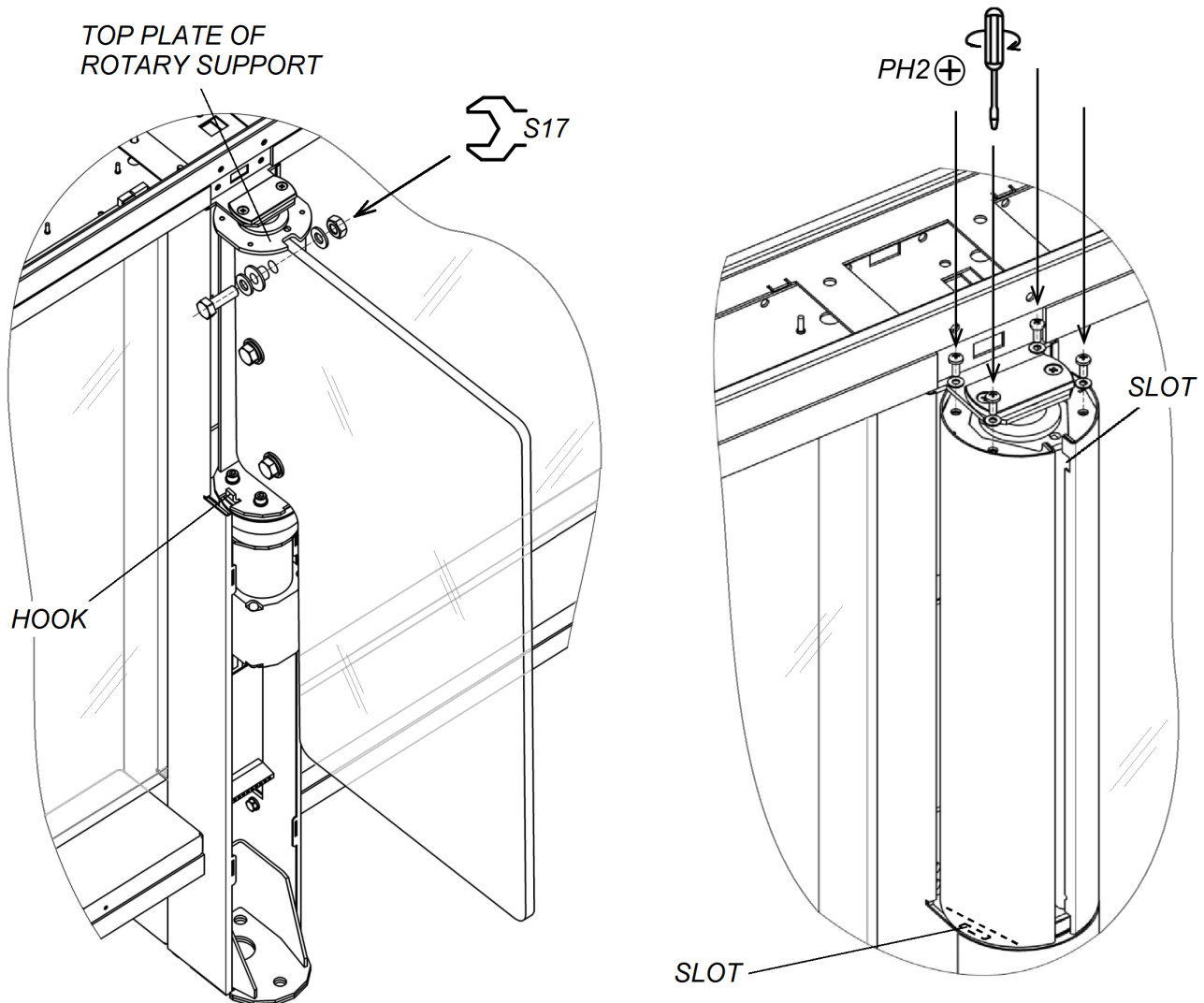


Figure 21. Swing panel and its cover plate

### 8.8.5 Central post indication block

In order to install the central post indication block (5), proceed as follows (Fig. 22):

1. Pull the cable from the central post indication block into the post top duct through the hole above the central post.
2. Pull the cable under the jumper in the duct and connect it to **LED** connector.
3. Install the indication block on the surface located above the rotary support of the swing panel and, using an SW4 Allen key, fix it on the post top duct (7) with two M5×10 screws with flat and spring washers from the delivery set.
4. Check the evenness of the gap between the indication block and the swing panel cover plate; if needed, loosen the M5×10 screws and adjust the gap. Tighten the screws.

Remove the central post indication block in reverse order. Prior to this, take the section top cover (6) off the speed gate section (Sect. 8.8.6, Fig. 23).

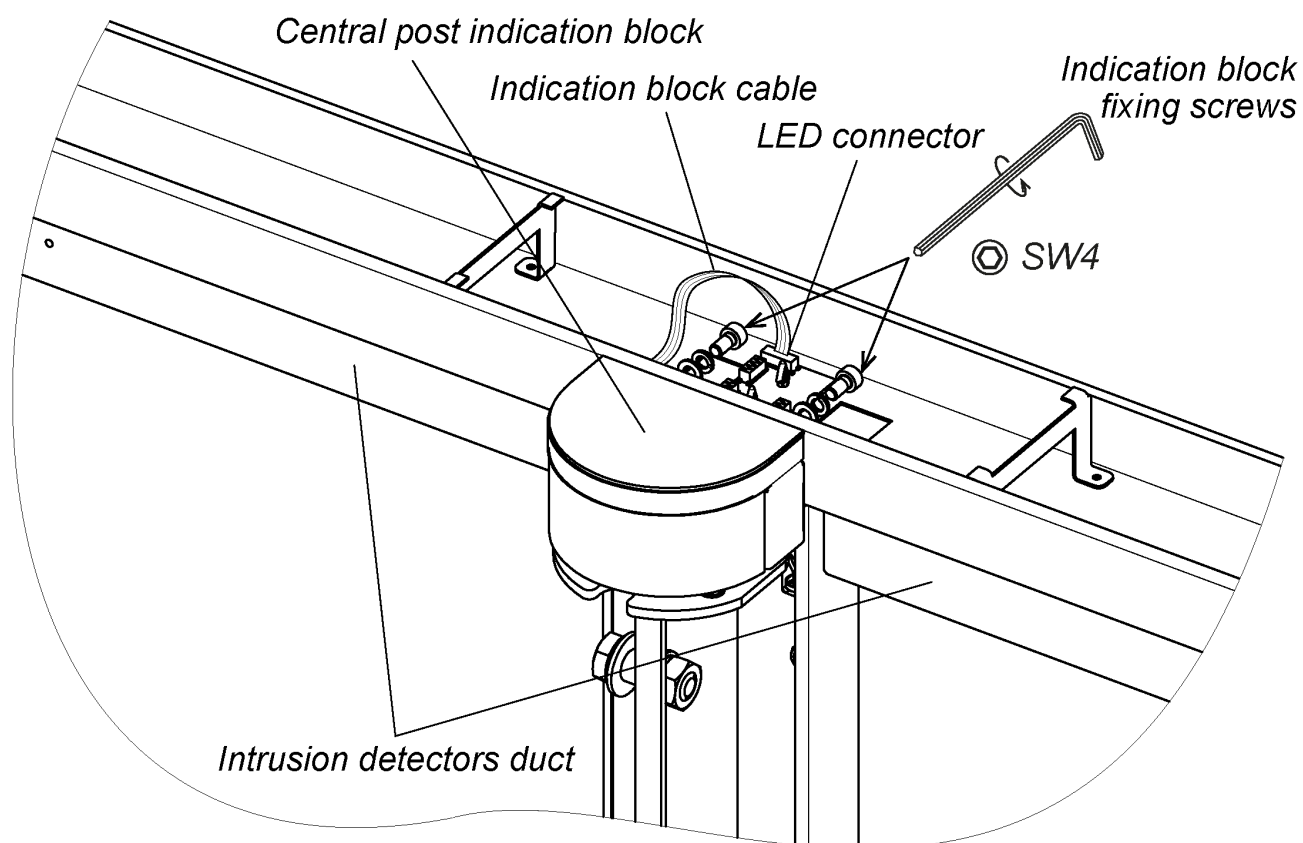


Figure 22. Central post indication block installation

### 8.8.6 Section top cover

Prior to the installation of the top cover (6), it is necessary to check if all required connection cables have been connected to the indication blocks (sect. 8.8.2, 8.8.5).

Installation procedure for the section top covers (Fig. 23):

- Connect the connection cable from the indication control module (PASS connector, Fig. 20) to the indication board.
- Carefully put the cover on the top duct of the section. **To prevent the connection cables from being damaged, ensure that they do not get stuck between the fixing brackets and protection plates!**
- Fasten four M4×16 screws and spring washers included in the delivery set using an SW4 Allen key through the holes in the bottom part of the section top duct (Fig. 20).

During the installation, pay attention to the gaps between the top cover and the duct along the whole perimeter, and if those need to be eliminated, repeat the above-mentioned steps.

The top cover is removed in reverse order.

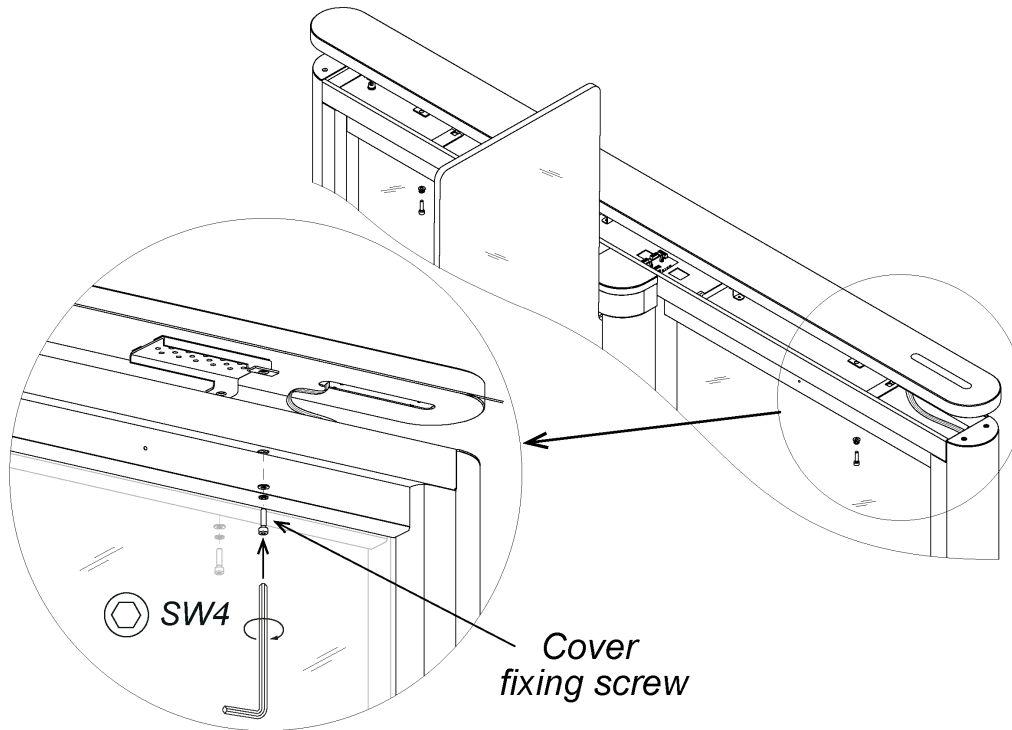


Figure 23. Top cover installation

### 8.8.7 Intrusion detector duct covers



**Attention!**

It is not necessary to remove covers of intrusion detector ducts when installing the speed gate; this is required only during maintenance or repairs.

The intrusion detector ducts (top and bottom) contain boards with sensors.

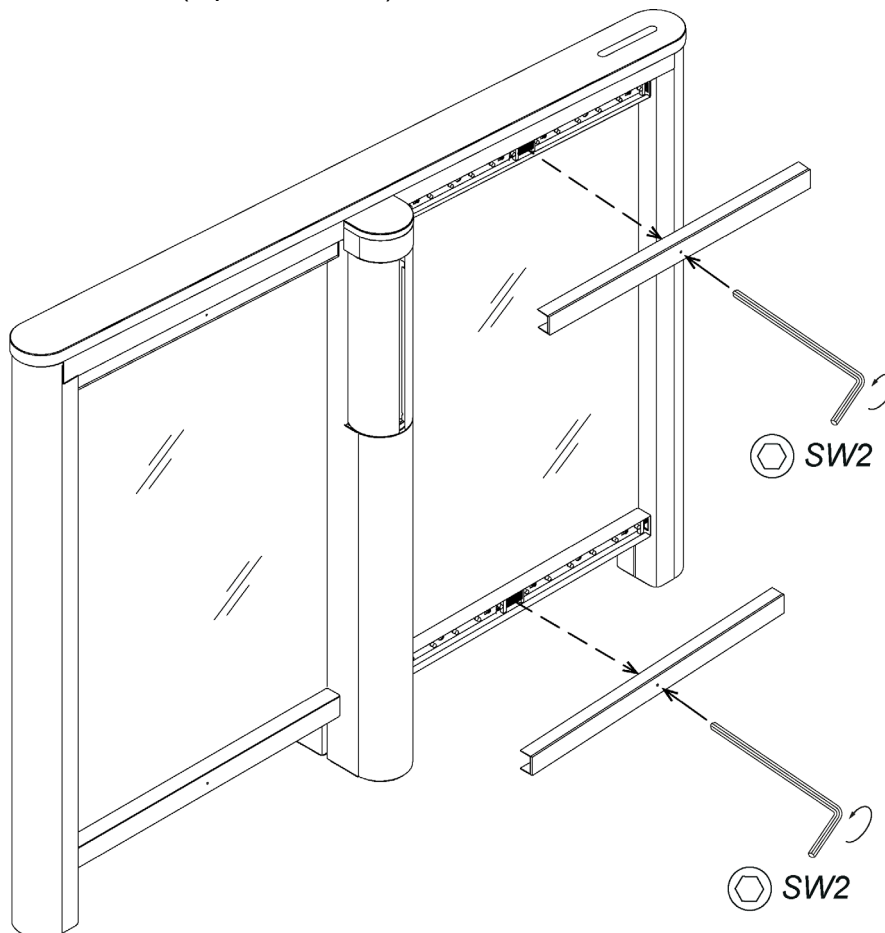


Figure 24. Removal of the covers of the top and bottom ducts of intrusion detectors

To remove the cover of an intrusion detector duct, unscrew the cover-fixing screw through the hole in the wall using an SW2 Allen key (see Fig. 24). The cover will partially be withdrawn from the duct by the screw; then it should be carefully pulled out and removed.

The duct cover is installed in reverse order.

## 9 OPERATION

When operating the speed gate, comply with safety measures specified in Sect. 7.2.



### **Attention!**

- Do not move any objects with dimensions exceeding the passageway width through the passage zone.
- Do not jerk and hit any elements of the speed gate to prevent their mechanical deformation.
- Do not dismantle or adjust mechanisms ensuring the speed gate operation.



### **Recommendations for cleaning and maintenance of stainless steel:**

The anti-corrosion effect of stainless steel depends on the state of the thin oxide layer on its surface. Therefore, soft lint-free napkins and cloths and non-abrasive neutral detergents should be used for its cleaning and maintenance. It is not allowed to use coarse and stiff sponges, brushes, and other items that can scratch the product surface. Avoid cleaners containing chlorides, ammonia, and other reagents that can damage the oxide film.

To remove tough stains from stainless steel, use non-abrasive products specially designed for this purpose according to their instructions (for instance, *E-NOX Clean* or similar).

After treatment, wash off the remaining detergents with clean water and wipe the treated surfaces dry. During the product operation, the use of special stainless steel protection products, containing neutral oils (for instance, *Glutoclean* or similar), is recommended.

### 9.1 Power-up



#### **Attention!**

Before powering the speed gate up, make sure that the passage zone is free, and nothing interferes with the swing panels' movement.

In order to power up the speed gate, proceed as follows:

1. Connect the speed gate's power supply unit via its mains cable to the mains socket with the voltage and frequency specified in the certificate for the power supply unit.
2. Switch on the speed gate's power supply unit. The speed gate's swing panels will search for the end positions and switch to the initial (locked) position.
3. The *Passage denial* command is sent automatically to the speed gate in pulse control mode, and the *Both directions closed* command in potential control mode until another command is sent from the external controller (Tables 7 and 8). The speed gate is ready for operation.

### 9.2 Pulse control mode

Speed gate control commands are sent from the RC panel and indicated on the speed gate sections in accordance with Table 7. Passage directions are independent of each other, i.e. sending a command for one direction does not change the state of the opposite passage direction.

The RC panel's buttons and light indicators are shown in Fig. 8. Please note the following:

- After sending the *Single passage in the set direction* command, speed gate intrusion detectors track the presence of a user in the passageway. After completing the passage, the speed gate automatically switches to the *Passage denial* mode.
- After sending the *Single passage in the set direction* command, if the passage has not been performed or if no other command has been sent, then the speed gate will automatically switch to the *Passage denial* mode upon expiry of the **Unlocked state holding time** (8 seconds by default).
- After sending the *Single passage in the set direction* command, if the passage has not been performed yet, the same command can be sent repeatedly for this direction, and the **Unlocked state holding time** countdown starts again.
- After sending the *Single passage in the set direction* command, the *Free passage* command cannot be sent for the other direction and will be ignored.

- After sending the *Free passage in the set direction* command, only the *Passage denial* or *Single passage in the set direction* command can be sent for the opposite direction, and all other commands will be ignored.

**Table 7. Pulse control mode**

Command	RC-panel operator actions <sup>1</sup>	Indication		Speed gate state
		RC panel	Central post	
<i>Passage denial</i>	Press the <b>STOP</b> button	Red <i>Stop</i> indicator is on	Red for both directions	The swing panels are closed
<i>Single passage in the set direction</i>	Press the button: <b>LEFT/ RIGHT</b>	Red <i>Stop</i> indicator is on, and the green <i>Left / Right</i> indicator for the set direction is on	Green for the chosen direction	The swing panels open in the passage direction and automatically close upon completion of the passage
<i>Free passage in the set direction</i>	Press two buttons at the same time: <b>STOP and LEFT/ RIGHT</b>	Green <i>Left / Right</i> indicator of the set direction is on	Green for the chosen direction	The swing panels are open in the free passage direction until receiving the next command
<i>Free passage</i>	Press three buttons at the same time: <b>LEFT, STOP, and RIGHT</b>	Both green <i>Left</i> and <i>Right</i> indicators are on	Green for both directions	The swing panels are open in one of the directions for passage in both directions until receiving the next command

### 9.3 Potential control mode

Speed gate control commands are sent and indicated according to Table 8. Passage directions are independent of each other, i.e. sending a command for one direction does not change the opposite passage direction mode.

**Table 8. Potential control mode**

Command	Required to ensure	Indication		Speed gate state
		RC panel	Central post	
<i>Both directions closed</i>	High level on the <i>Unlock A</i> and <i>Unlock B</i> contacts (or low level on the <i>Stop</i> contact)	Red <i>Stop</i> indicator is on	Red for both directions	The swing panels are closed
<i>Direction open</i>	Low level on the contact of the chosen direction. High level on all other contacts	Green indicator of the chosen <i>Left / Right</i> direction is on	Green for the chosen direction	The swing panels are open in the passage direction
<i>Both directions open</i>	Low level on the <i>Unlock A</i> and <i>Unlock B</i> contacts. High level on the <i>Stop</i> contact	Both green <i>Left</i> and <i>Right</i> indicators are on	Green for both directions	The swing panels are open in one of the directions

<sup>1</sup> Buttons on the WRC fob implement the same functions as the RC-panel buttons.

## 9.4 Emergency response

### 9.4.1 Emergency mode

In case something interferes with the free rotation of the swing panels, the speed gate automatically switches to the *Emergency* mode. This mode is required to avoid motor drive failure caused by overheating.

If there is an obstacle interfering with the rotation of swing panels in the set direction, three attempts of rotation in the same direction are performed with a 3 seconds interval. If the obstacle is not removed after this, the speed gate switches to the *Emergency* mode. In *Emergency* mode, the speed gate's swing panels can turn freely at a  $\pm 90^\circ$  angle, which allows unhindered removal of the obstacle from the passage zone. In this case, all three light indicators of the RC panel are flashing, and a continuous audio signal is sounding.

The *Emergency* mode will be switched off automatically after the obstacle is removed, the speed gate passage zone is cleared, and the swing panels are set into their initial (closed) position.

Apart from this, the *Emergency* signal is automatically generated if the passage zone of the speed gate is occupied by something or someone for more than 30 seconds. The signal will be deactivated after the passage zone is cleared.

### 9.4.2 Fire Alarm mode

In case of hazardous situations in the territory of the facility, the speed gate passage zone can be used as an additional emergency exit.

It is possible to switch the speed gate to the *Fire Alarm* mode via the emergency unblocking device (a fire alarm device, emergency button, etc.). In this mode, the swing panels open in one of the directions and remain open for free passage in both directions; green passage permission indicators are switched on in the flashing mode on indication blocks simultaneously for both directions. Control commands from other devices and software are ignored in this mode.

In addition, in case of power supply failure or disconnection, the swing panels can be opened manually (they are not locked).



#### **Attention!**

In case of fire, natural disasters, and any other emergency situations, it is necessary to provide an emergency exit, complying with safety requirements, to evacuate people from the facility urgently. For example, the **BH-02** anti-panic rotary railing section can be applied as an emergency exit.

## 9.5 Troubleshooting

Possible faults to be corrected by the customers themselves are listed in Table 9.

**Table 9. Troubleshooting**

Fault	Most probable cause	Remedy
The power supply unit is switched on, but the speed gate does not function, and the RC-panel and speed gate post indicators are off	No operating voltage is applied to the control board.	Disconnect the speed gate's power supply unit from the mains, open the central post cover plate. Check the integrity of the power cable, check that the power cable is securely fastened in the <b>XT3</b> terminal block of the control board.
One of the indication blocks does not work, while the speed gate operation corresponds to the algorithm (clause 5.2.7)	No control signal is sent to the indication block	Check the integrity of the connecting cable of the indication block, check the reliability of its fastening in the connectors

If the fault cannot be eliminated, we advise you to contact the **PERCo** Technical Support Department.

## 10 TECHNICAL MAINTENANCE

Technical maintenance is to be performed by qualified specialists after careful study of this Manual.



### ***Attention!***

To prevent damage and to maintain the appropriate quality of the coating, one needs to clean the surface of the speed gate from dirt regularly, at least once a quarter.  
Recommendations on how to clean stainless steel can be found in Section 9.

Use non-abrasive liquid cleaners, containing aqua ammonia, to clean the swing panels of the speed gate from dirt.

## 11 TRANSPORTATION AND STORAGE

The speed gate may be stored in dry indoor facilities at an ambient air temperature from -40°C to +50°C and relative air humidity of up to 80% at +15°C. The storage premises must be free of acid and alkali vapors as well as corrosive gases.

The speed gate in the manufacturer's original packaging is allowed to be transported only in closed transport (railway cars, containers, closed motor cars, holds, airplanes, etc.).

Do not stack the boxes with the speed gates during transportation and storage.

After transportation or storage at temperatures below zero or at high air humidity, the speed gate needs to be kept in the packaging for no less than 24 hours prior to installation works under normal climate conditions corresponding to its operating conditions.

## APPENDICES

### Appendix 1. Command transmission algorithm in pulse control mode

*Passage denial* (locked for entry and exit) – active front at the *Stop* contact while there is a high level at the *Unlock A* and *Unlock B* contacts. Both passage directions are blocked at this command.

*Single passage in direction A* (open for passage of one person in the A direction) – active front at the *Unlock A* contact while there is a high level at the *Stop* and *Unlock B* contacts. At this command, the A passage direction opens either for 8 sec. or until the passage has been made in this direction or until the *Passage denial* command, and the status of the B passage direction does not change. The command is ignored if, at the time of its receipt, the status of the A passage direction is *Free passage*.

*Single passage in direction B* (open for passage of one person in the B direction) – active front at the *Unlock B* contact while there is a high level at the *Stop* and *Unlock A* contacts. At this command, the B passage direction opens either for 8 sec. or until the passage has been effected in this direction or until the *Passage denial* command, and the status of the A passage direction does not change. The command is ignored if, at the time of its receipt, the status of the B passage direction is *Free passage*.

*Free passage in direction A* (open for free passage in the A direction) – active front at the *Unlock A* contact while there is a low level at the *Stop* contact and a high level at the *Unlock B* contact, or active front is at the *Stop* contact while there is a low level at the *Unlock A* contact and a high level at the *Unlock B* contact. At this command, the A passage direction opens until the *Passage denial* command is received; the status of the B passage direction does not change at that.

*Free passage in direction B* (open for free passage in the B direction) – active front is at the *Unlock B* contact while there is a low level at the *Stop* contact and a high level at the *Unlock A* contact, or active front is at the *Stop* contact while there is a low level at the *Unlock B* contact and a high level at the *Unlock A* contact. At this command, the B passage direction opens until the *Passage denial* command is received; the status of the A passage direction does not change.

*Free passage* (open for free passage in both directions) – active front is at the *Unlock A* contact while there is a low level at the *Unlock B* and *Stop* contacts, or active front is at the *Unlock B* contact while there is a low level at the *Unlock A* and *Stop* contacts, or active front is at the *Stop* contact while there is a low level at the *Unlock A* and *Unlock B* contacts. Both directions open at this command until the *Passage denial* command is received.

### Appendix 2. Command transmission algorithm in potential control mode

*Both directions closed* (locked for entry and exit). There is a high level at the *Unlock A* and *Unlock B* contacts or a low level at the *Stop* contact. Both passage directions are blocked at this command.

*Direction A is open* (open for passage in the A direction). There is a low level at the *Unlock A* contact while a high level is present at the *Stop* and *Unlock B* contacts. At this command, the A direction opens until a low-level signal is removed from the A contact or until the *Both directions closed* command is received. The status of the B direction does not change.

*Direction B is open* (open for passage in the B direction). There is a low level at the *Unlock B* contact while there is a high level at the *Stop* and *Unlock A* contacts. At this command, the B direction opens until a low-level signal is removed from the B contact or until the *Both directions closed* command is received. The status of the A direction does not change.

*Both directions open* (open for passage in both directions). There is a low level at the *Unlock A* and *Unlock B* contacts while there is a high level at the *Stop* contact. Both directions open at this command until a low-level signal is removed from the A or B contact or until the *Both directions closed* command is received.



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