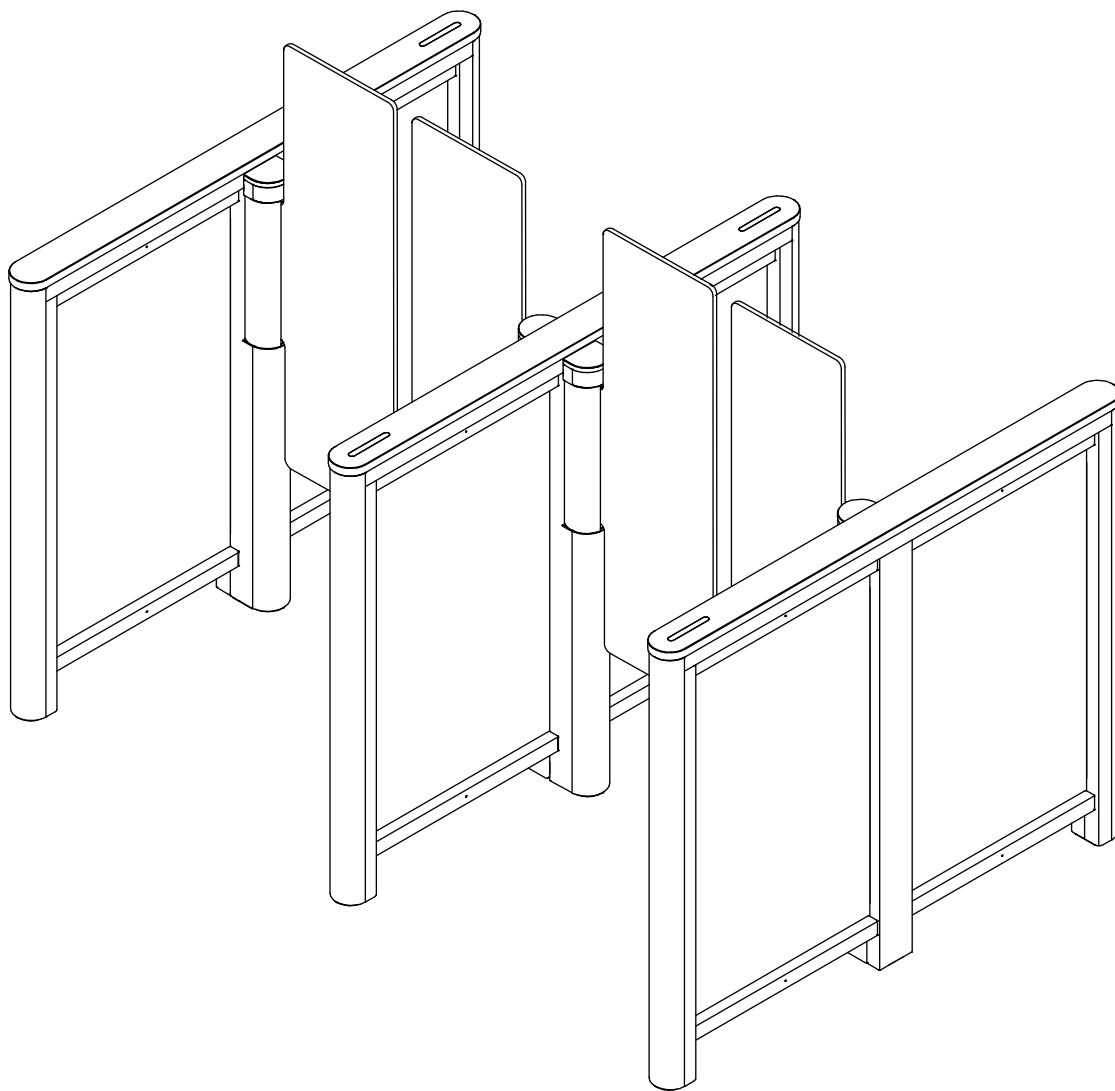


PERCo[®]

ASSEMBLY AND OPERATION MANUAL



ST-11, STD-11

ERC
CE

SPEED GATE AND DOUBLE-SIDED SECTION

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Dear Customer!

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

Assembly and Operation Manual for the **ST-11 speed gate** and **STD-11 double-sided section** (hereinafter – the *Manual*) contains the instructions on safe transportation, storage, installation, operation and maintenance of the above-mentioned products. The installation must be carried out by qualified installers in strict accordance with the Manual.

Abbreviations adopted in the Manual:

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

Due to continuous improvement of products, the Manufacturer reserves the right to modify, without previous notice, the product design not aggravating its technical specifications.

1 FUNCTION

ST-11 speed gate (hereinafter – the *speed gate*) is designed for pedestrian passage control at entrance points of administrative buildings, banks, shops, railway terminals, airports, etc.



Attention!

ST-11 speed gate is designed for the passage of pedestrians taller than 1 m, otherwise correct operation of the speed gate is not guaranteed. Pass through the speed gate of children less than 1 m height tall can **only be carried by the hand accompanied by adults**¹.

The speed gate features two sections: **ST-11/M** (hereinafter – *Master section*) and **ST-11/S** section (hereinafter – *Slave section*). In a standard delivery set the speed gate allows to arrange one passage lane. The width of the passage lane depends on the chosen swing panel width.

Use **STD-11 double-sided section** (hereinafter – *double-sided section*) to arrange more passage lanes. Each double-sided section provides one extra passage lane.



Note:

Inside the turnstile sections, it is possible to install access card readers as manufactured by **PERCo (IR13, IR19)**, and by third-party manufacturers. **Access card readers are not included** in the standard delivery set of the turnstile! The choice of the type of the reader, the purchase and installation according to the checkpoint blueprint and the ACS characteristics is the client's (installer's) responsibility. Readers must meet the following requirements:

- Overall dimension (length × width × height) max. 155×68×28 mm
- Read range min. 40 mm

2 OPERATING CONDITIONS

The product with regard to resistance to environmental exposure complies with GOST15150-69 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 80% at +25°C.

¹ If the turnstile is installed in children's institutions or in organizations working with children, where more secure passage mode is required, it is recommended to reflash turnstile controller with a special firmware (ST11_Children). Its main feature is the safety zone increased to the whole passage zone of the turnstile and particular operation algorithm when closing swing panels will open if at least one sensor of the turnstile is active. In order to get necessary recommendations regarding the firmware installation, please contact PERCo technical support team.

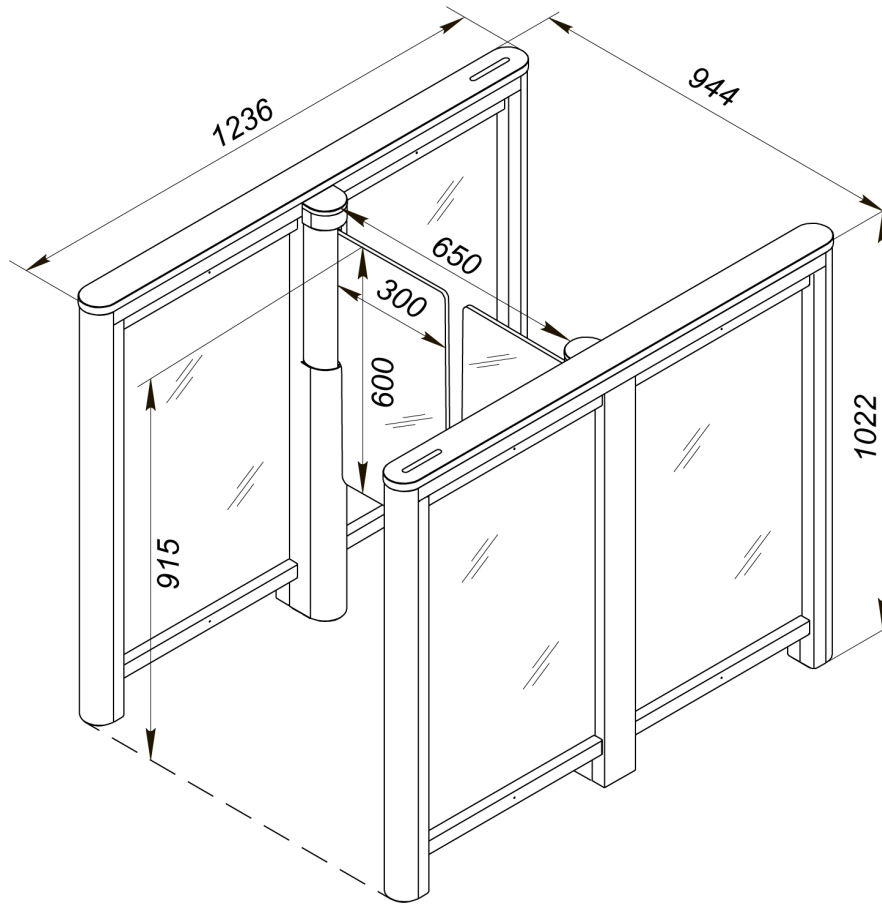


Figure. 1 ATG-300 overall dimensions

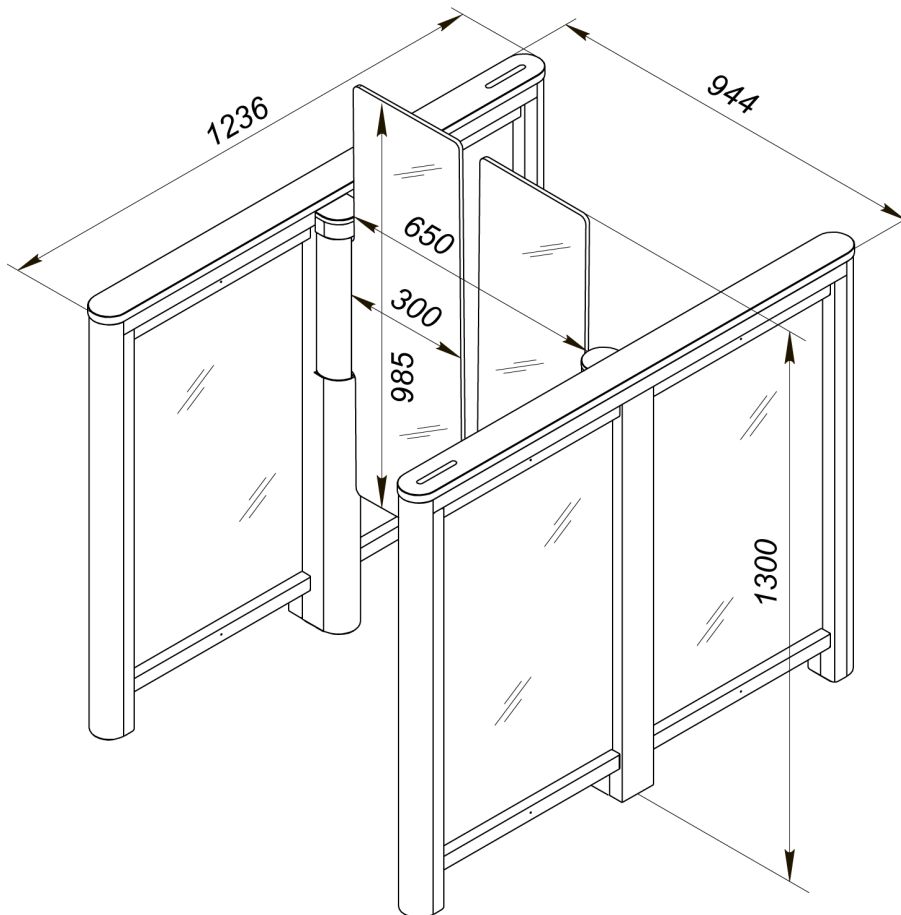


Figure. 2 ATG-300H overall dimensions

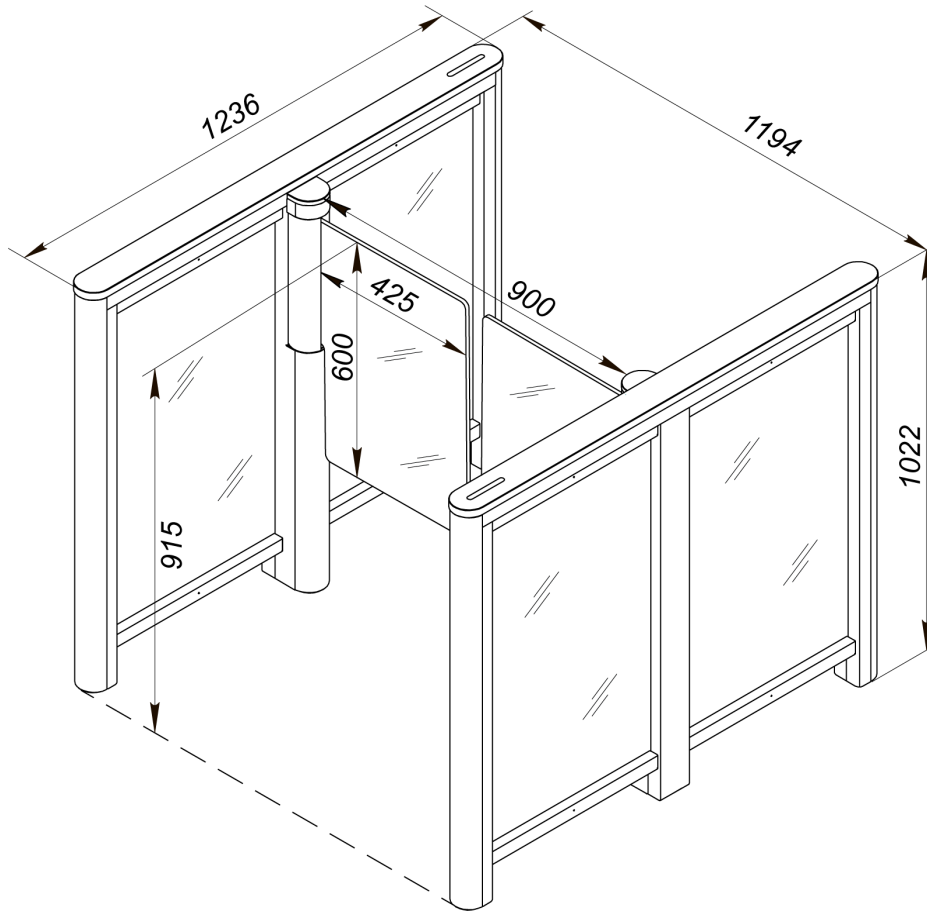


Figure. 3 ATG-425 overall dimensions

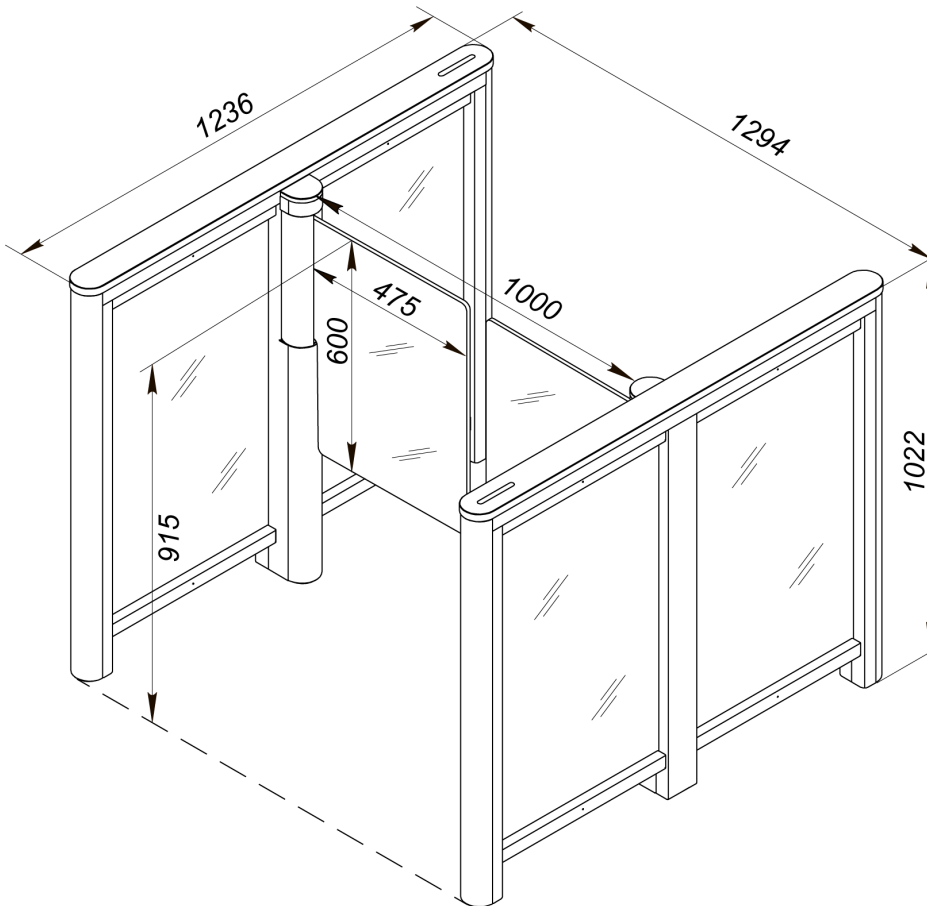
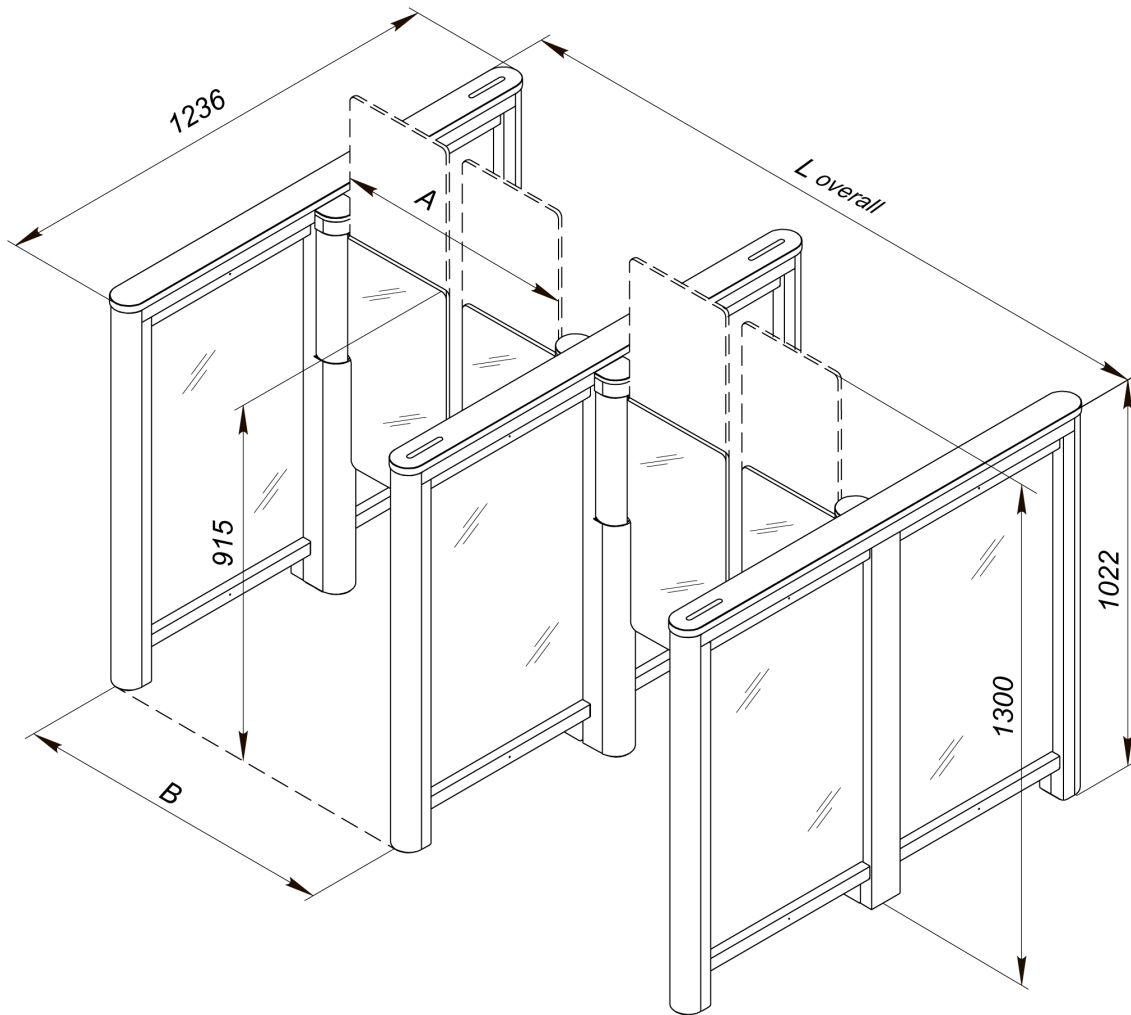


Figure. 4 ATG-475 overall dimensions



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 Turnstile's overall dimensions when organizing several passage zones

3 TECHNICAL SPECIFICATIONS

Operating voltage ¹	24±2.4 VDC
Current consumption ²	max.6.5 A
Power consumption	max. 160 W
Throughput rate in a single passage mode	up to 60 persons / min
Passageway width:	
with ATG-300, ATG-300H swing panel	650 mm
with ATG-425 swing panel	900 mm
with ATG-475 swing panel	1000 mm
Number of intrusion detectors:	
upper level	24
lower level	24
RC-panel cable length ³ min	6.6 m
IP rating	IP41 (EN 60529)
Electric shock protection class	III (IEC 61140)

¹ The power supply is connected to the control board located in the *Master* section (on the *Master* side of the double-sided section) and has the “ST-11.771” marking.

² Current consumption and power consumption are given for each product **ST-11** and **STD-11** individually.

³ Maximum allowable cable length of the RC panel is 40 m (supplied upon request).

Mean time to failure	min. 8,000,000 passages
Mean lifetime	8 years
Overall dimensions (L × W × H): see Fig. 1 - 5), mm:	
with ATG-300 swing panel	1236×944×1022 mm
with ATG-300H swing panel	1236×944×1300 mm
with ATG-425 swing panel	1236×1194×1022 mm
with ATG-475 swing panel	1236×1294×1022 mm



Note:

Use the following formula to calculate the overall speed gate width in case several passage lanes are arranged (Fig. 5): **L overall= 864 n + 1114 m +1214 k +130 (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):

ST-11/M section	max 85 kg
ST-11/S section	max 85 kg
STD-11 double-sided section	max 100 kg
ATG-300 swing panel	max 6 kg
ATG-300H swing panel	max 9 kg
ATG-425 swing panel	max 8 kg
ATG-475 swing panel	max 9 kg

4 DELIVERY SET

4.1 Standard delivery set

4.1.1 ST-11 Speed gate

Main equipment:

Section ST-11/M (Master) ¹	1
Section ST-11/S (Slave) ¹	1
Top cover	2 (in a separate box)



Note:

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

- **STC-11M** – made of artificial stone with a built-in indication unit;
- **STC-11S** – made of stainless still with a built-in rubber patch with a mnemonic image.

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



Note:

The type of the swing panel is chosen by the customer. The following swing panel models are available (see Fig. 1, 2, 3, 4):

- **ATG-300** – for 650 mm passageway arrangement;
- **ATG-300H** – increased height swing panel for 650 mm passageway arrangement;
- **ATG-425** – for 900 mm passageway arrangement;
- **ATG-475** – for 1000 mm passageway arrangement.

RC-panel with cable	1
Jumper	3

Installation tools:

Section top cover mounting kit:

M4×16 screw	8
washer (4)	8

¹Both sections are delivered with dismantled: top covers, swing panels and central indication units.

Central post indication block mounting kit:	
M5×16 screw	4
washer (5)	4
Swing panel cover plate mounting kit:	
M4×10 screw	8
washer (4)	8
Swing panel mounting kit:	
M10×30 bolt	6
screw nut M10	6
washer	12
plastic plug	6
Cardboard template for the settling surface marking	1
Technical documentation:	
Certificate	1
Assembly and Operation manual	1
Packaging:	
Transportation box for the <i>Master</i> and <i>Slave</i> sections	1
Box for section top covers	1
Box for swing panels	1

4.1.2 STD-11 double-sided section

Main equipment:

Double-sided section ¹	1
Section top cover	1 (in a separate box)



Note:

The type of top cover is to be chosen by the Customer. The following top cover models for the **STD-11** are available:

- **SDC-11M** – made of artificial stone with a built-in indication unit;
- **SDC-11S** – made of stainless steel with a built-in rubber patch with a mnemonic image.

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



Note:

The type of the swing panel is chosen by the customer. The following swing panel models are available (see Fig. 5):

- **ATG-300** – for 650 mm passageway arrangement;
- **ATG-300H** – increased height swing panel for 650 mm passageway arrangement;
- **ATG-425** – for 900 mm passageway arrangement;
- **ATG-475** – for 1000 mm passageway arrangement.

RC-panel with cable	1
Jumper	3

Installation tools:

Section top cover mounting kit:	
M4×16 screw	4
washer (4)	4
Central post indication block mounting kit:	
M5×16 screw	4
washer (5)	4
Swing panel cover plate mounting kit:	
M4×10 screw	8
washer (4)	8
Swing panel mounting kit:	
M10×30 bolt	6

¹The section is delivered with dismantled: top covers, swing panels, top covers and central indication units.

screw nut M10	6
washer	12
plastic plug	6
Technical documentation:	
Certificate	1
Packaging:	
Transportation box for the double-sided section	1
Box for section top cover	1
Transportation box for swing panels	1

4.2 Optional equipment that can be ordered in addition to the standard delivery set

<i>IR13</i> or <i>IR19</i> card readers	2 per a passage lane
Anchor M10 with screw and washer:	
for the <i>ST-11</i> speed gate	12
for <i>STD-11</i> section	8
Wireless remote control ¹	1

5 DESIGN AND OPERATION

5.1 Main features

- The speed gate allows to perform several authorized single passages in a row in one direction without the swing panels being closed.
- The speed gate is a normally-open device, which means that when the equipment is de-energized the swing panels move freely at $\pm 90^\circ$ angle.
- The intrusion detectors are installed on two levels throughout the speed gate passage lane. This allows monitoring user's location inside the passage lane. The speed gate also makes it possible for several users to be in the same passage lane at the same time.
- There are several swing panel models, that can be chosen according to the passage lane width and to the operation peculiarities upon making an order.
- Section top covers may be chosen when ordering; they can be made of tempered glass or stainless steel.
- The number of the passage lanes can be increased with *STD-11* double-sided section installation.
- The turnstile supports two control modes: pulse and potential.
- It is possible to switch the speed gate to "*Auto-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 operating modes if the passage lane is occupied for more than 30 seconds.
- The equipment can operate as an operating device as a part of ACS or as a standalone unit operated from the RC-panel.
- The speed gate provides the possibility of proximity card readers installation inside the posts under the glass section top cover.
- The top covers made of the artificial stone (*STC-11M*, *SDC-11M*) have the indication units built-in.
- The speed gate features the swing panel position adjustment in the initial (locked) position (training mode).
- The pass denial / grant indication units on the central block are well seen by the user when passing the turnstile. It allows the users not to look for other indication units and pass faster.
- The equipment provides the possibility of external indication block connection to duplicate passage grant / denial indication.
- Acoustic alarm (siren) connection is provided to warn the operator about unauthorized access attempt.

¹The WRC set contains a receiver that is connected to the control board and the transmission unit (pendent).

- Automatic emergency opening of the passage is provided upon receipt of an “Fire Alarm” signal. The “Fire Alarm” signal can be sent by the emergency system device or by the operator using the emergency button (hereinafter – emergency passage opening device).
- The components are made of polished stainless steel. The swing panels and the filling glass are made of tempered glass of 8 -10 mm thick.

5.2 Design

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

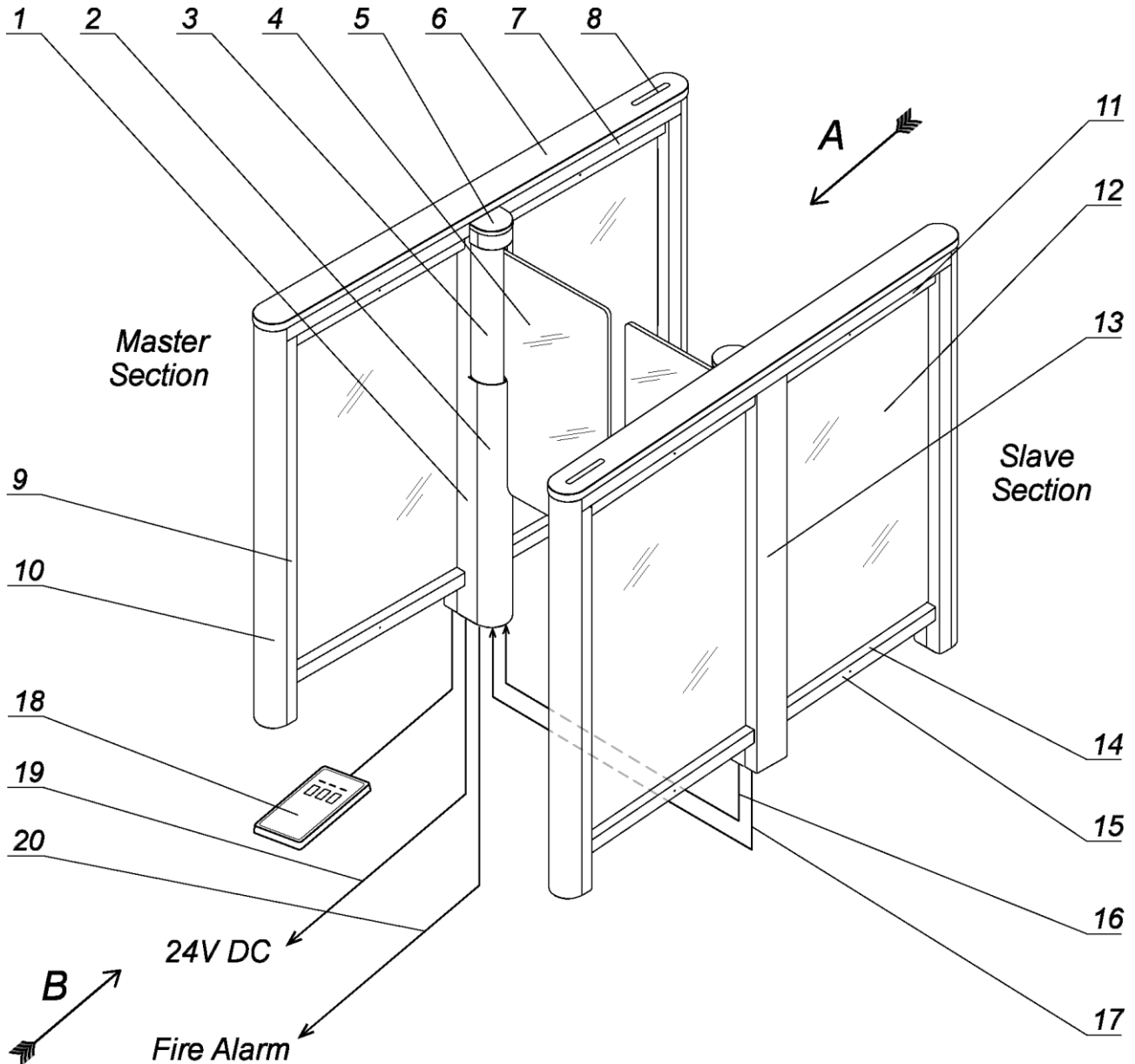


Figure. 6 ST-11 overall view:

- 1 – central post; 2 – central post cover plate; 3 – swing panel cover plate; 4 – swing panel;
 5 – central post indication block; 6 – front end indication block; 7 – the section top duct;
 8 – section top cover; 9 – central post rear panel; 10 – side post;
 11 – the intrusion detectors top duct; 12 – filling glass; 13 – central post rear panel;
 14 – the intrusion detectors lower duct; 15 – intrusion detectors duct cover; 16 – DC cable;
 17 – CAN cable; 18 – power supply with a cable; 19 – bottom duct; 1¹ 20 – Fire Alarm cable¹.

¹ Not included in the standard delivery set.

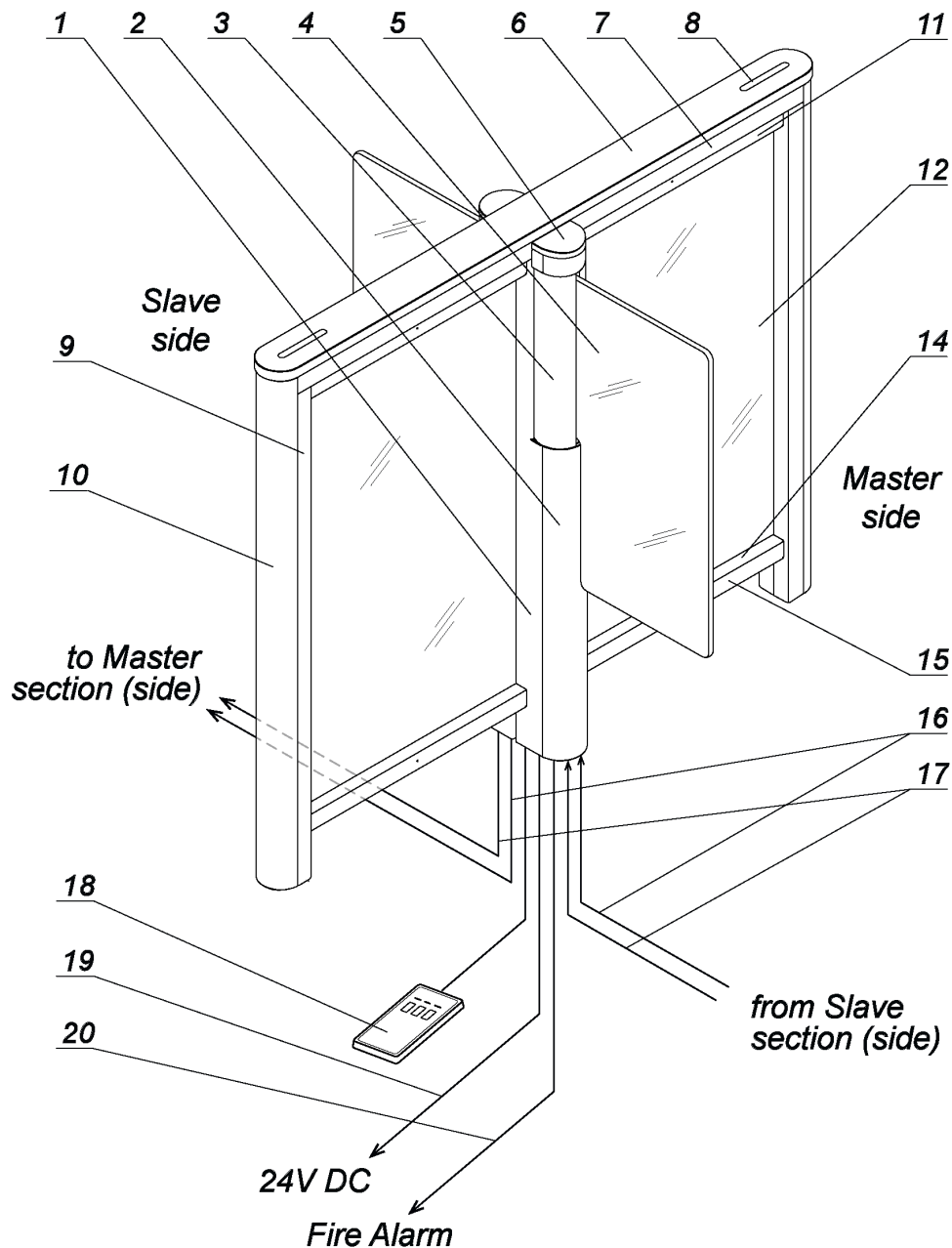


Figure. 7 STD-11 overall view:

- 1 – central post; 2 – central post cover plate; 3 – swing panel cover plate; 4 – swing panel;
- 5 – central post indication block; 6 – front end indication block; 7 – the section top duct;
- 8 – section top cover; 9 – central post rear panel; 10 – side post;
- 11 – the intrusion detectors top duct; 12 – filling glass; 14 – the intrusion detectors bottom duct;
- 15 – intrusion detectors duct cover; 16 – DC cable; 17 – CAN cable; 18 – power supply cable;
- 19 – bottom duct; ¹ 20 – Fire Alarm cable¹.

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

Use double-sided sections to arrange more passage lane. Double-sided section is complemented by the RC-panel. It has two rotating panels (4): on the *Master* side and on the *Slave* side. Each swing panel has its motor drive. *Slave* side is connected to the speed gate *Master* section or to the *Master* side of another double-sided section with two connection cables (16, 17). The speed gate *Slave* section (*Slave* side of the next double-sided section) is connected to *Master* side with two connection cables (21, 22) from the standard delivery set.

¹ Not included in the standard delivery set.

5.2.1 Section

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

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

The central post (1) features an indication block (5) with square color indicators of passage grant / denial.

The swing panel (4) is fixed to the central post rotating support. The rotating support is covered with the central post cover plate (3). The rotating support is driven by motor, located under the swing panel cover plate (2).

The top covers made of the artificial stone (**STC-11M** and **SDC-11M**) have the indication units built in (8).

The bottom part of the *Master* section central post features **ST-01.771** speed gate control board (hereinafter – *control board*). The PS, the RC-panel (WRC receiver), Fire Alarm device and *Slave* section connection cables are connected to the control board.

5.2.2 Indication blocks

Each section features the following indication blocks:

- The indication unit (8) on the top covers made of the artificial stone (one on the **STC-11M** cover and two - on the **SDC-11M**) is a red indicator marking the access card presentation area. When the access card is presented and in case of the access permission the indicator turns green.
- Central post indication block (5) is designed for passage grant (green light) / denial (red light) indication for each direction.

5.2.3 RC-panel

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

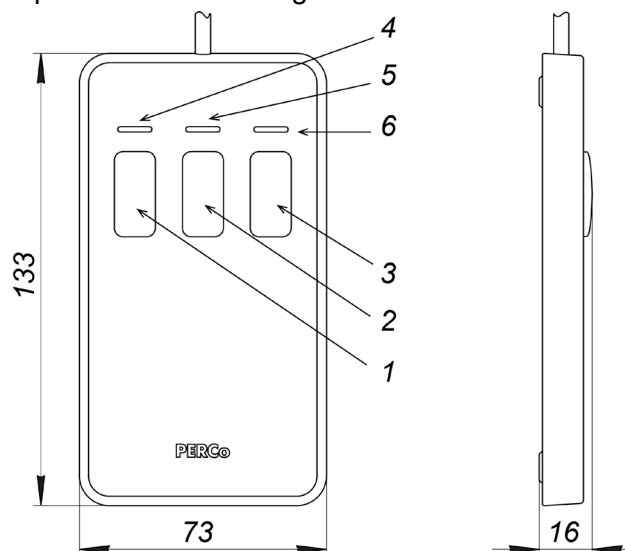


Figure. 8 Overall view and dimensions of the RC-panel:

- 1, 2, 3 – **LEFT, STOP, RIGHT** buttons for mode setting;
4, 6 – green “*Left*”, “*Right*” indicators; 5 – red “*Stop*” indicator

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

RC-panel housing features three control buttons for sending commands. The middle **STOP** button serves for setting the “*Always locked*” mode. The **LEFT** and **RIGHT** buttons serve to open the

passage in the chosen direction. Up above the buttons there are LED lights, indicating passage direction status. The red “*Stop*” indicator shows the “*Always locked*” operating mode. The possible operation commands and RC-panel indication for pulse and potential operating modes are stated in Tables 7 and 8.

5.2.4 Control board

Speed gate control board (Fig. 9) is installed in the central post of *Master* section. Remove the central post cover plate in order to access the board (see Sect.8.9.1).

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

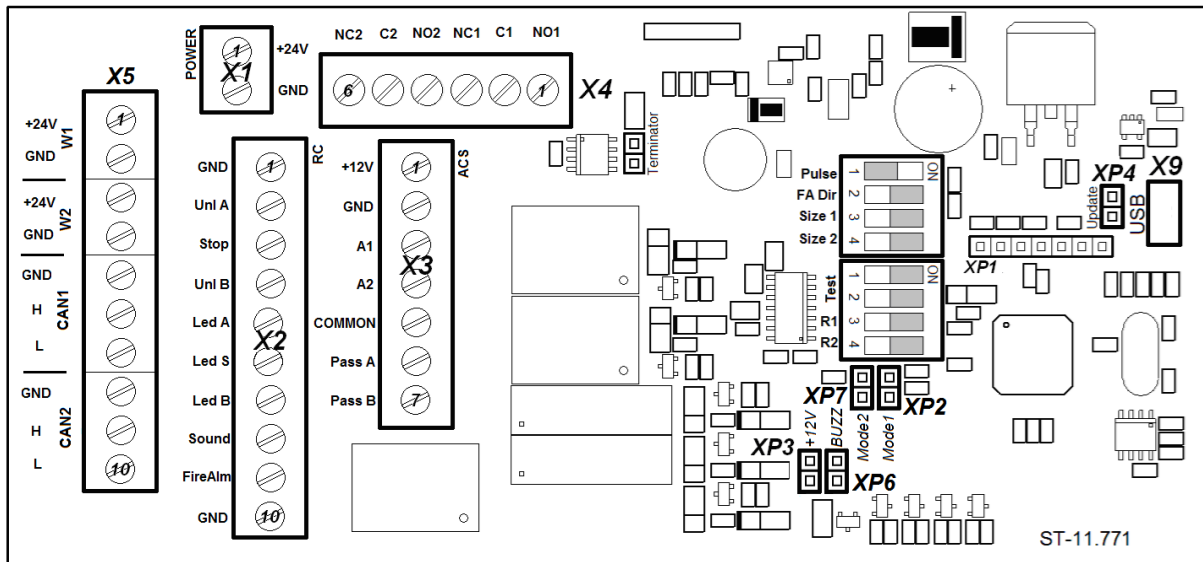


Figure. 9 Control board overall view

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

The control board features:

Connector blocks to connect: 1):

- **X1 (Power)** – speed gate power supply.
- **X2 (RC)** – operating devices: 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 controller board relay outputs.
- **X5** – DC and CAN connection cables of swing panel motor drives.
- **X9** – mini-USB connector for speed gate built-in software update.

Connectors for jumper installation:

- **XP1 (Program)** – secondary connector.
- **XP2 (Mode 1)** – connector not used (jumper is not installed upon delivery). During operating the jumper should be removed.
- **XP3 (+12V)** – connector for turning on LED indication on the control board. The jumper is installed by default, which corresponds to the activated buzzer.
- **XP4 (Update)** – connector for switching the control board to a Software update mode through USB interface. During the operation the jumper should be removed.
- **XP6 (BUZZ)** – connector for turning on the buzzer on the control board. Buzzer operation duplicates operation unit sound indication and siren activation. The jumper is installed by default, which corresponds to the activated buzzer.

- **XP7 (Mode2)** – connector for selecting the control mode when passing through the turnstile - normal or enhanced. Upon delivery, the jumper is installed, which corresponds to the normal control mode - in this mode, the “safe” zone is the entire space between the turnstile sections. In enhanced control mode (the jumper is removed), the “safe” zone is limited by the width of the turnstile swing panels.

Switches:

- **Pulse** – to turn the speed gate to a pulse control mode. By default, the switch is in **ON** position, which corresponds to a pulse speed gate operating mode.
- **FA_Dir** – to choose swing panel direction of rotation in case an emergency passage opening (*Fire Alarm*) signal is sent. By default, the switch is in **OFF** position, which corresponds to the swing gate being opened in B direction.
- **Size1, Size2** – to set the speed gate swing panels size. 2). By default, both switches are in **OFF** position.
- **Test1** – not used. When operating, the switch must be in **OFF** position.
- **Test2** – for turning on LED indication on intrusion detectors boards. By default, both switches are in **OFF** position, which corresponds to the indication being switched off.
- **R1** – turns on the “Auto-opening in the selected direction” mode (Sect. 8.8). When switching the switch is in **OFF** position– turned off (Table 3).
- **R2** – switches the speed gate to the training mode (Sect. 8.7), if the **R1** switch is in **OFF** position, or is used for selecting the direction of “Auto-opening” mode if the **R1** switch is in **ON** position. By default, the switch is set in **OFF** position (see Table.3).

Table1. Function of the control board terminal block contacts

Connector block	No	Contact	Function
X1 (Power)	1	+24V	External power supply connection
	2	GND	
X2 (RC)	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 control input on the RC-panel
	6	Led Stop	Passage denial control input on the RC-panel
	7	Led B	B direction control input on the RC-panel
	8	Sound	RC-panel sound signal output
	9	Fire Alarm	Emergency passage unlocking control input
	10	GND	
X3 (ACS)	1	+12V	+12V output for additional equipment powering
	2	GND	General
	3	Alarm1	Siren connection output
	4	Alarm2	
	5	Common	Common for <i>PASS A, PASS B</i> outputs
	6	PASS A	<i>PASS A</i> relay contact (passage in A direction)
	7	PASS B	<i>PASS B</i> relay contact (passage in B direction)
X4	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	Normally open contact of the <i>Light B</i> output
	6	NC2	Normally closed contact of the <i>Light B</i> output

Table 2. Positioning of *Size1* according to the swing panel type

Swing panel model	Switches positioning	
	Size1	Size2
<i>ATG-300</i>	ON	OFF
<i>ATG-300H</i>	ON	ON
<i>ATG-425, ATG-475</i>	OFF	OFF

Table 3. Speed gate operating modes in different positions of R1 and R2 switches

Switch position		Mode
R1	R2	
OFF	OFF	Training and "Auto-opening" modes are turned on
OFF	ON	Training mode is switched on (Sect. 8.7)
ON	OFF	"Auto-opening" mode is switched on in A direction (Sect. 8.8)
ON	ON	"Auto-opening" mode is switched on in B direction (Sect. 8.8)

5.2.5 Control signals

Speed gate operation is performed by sending control signals to *Unlock A*, *Stop* and *Unlock B* outputs. The control signal is **sending a low-level signal** to *Unlock A*, *Stop* and *Unlock B* contacts regarding *GND* contacts. Normally open relay contact or layout with an open collector output can serve as a control element (Fig. 10 and 11).

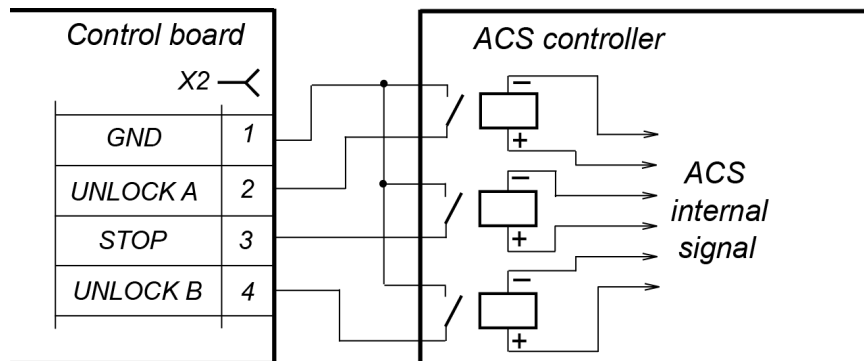


Figure. 10 The external device control elements – normally open relay contact

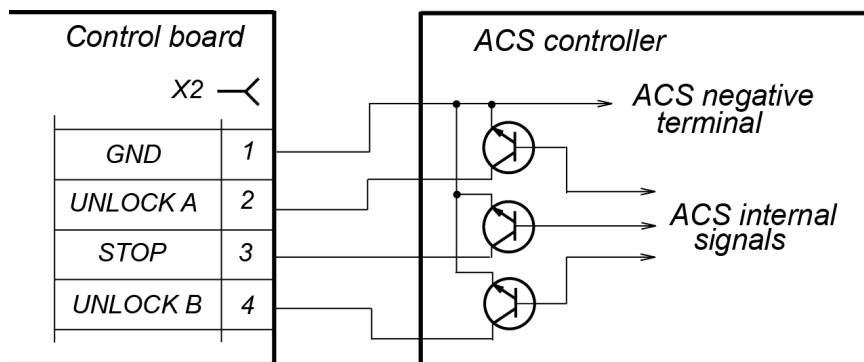


Figure. 11 The external device control elements – open collector output layout

Speed gate emergency unlocking is performed by sending a control signal to *Fire Alarm* input. The control signal is a **low-level signal release** from *Fire Alarm* contact regarding *GND* contact. A normally closed relay contact or an open collector output layout can serve as a control element. In this case all other incoming control commands are ignored. Sending a low-level signal to *Fire Alarm* input, "Always locked" mode is activated, in which the swing panels get closed.



Note:

Use 1 kOhm resistors connected to + 3,3 V voltage plane to generate a high-level signal on all input contacts (*Unlock A*, *Stop*, *Unlock B*, *Fire Alarm*).

Control element is to provide the following characteristics of the signals:

control element – relay contact:

minimum commutated current max 4 mA
 closed contact resistance (regarding connection cable resistance) max 200Ohm

control element – open collector output layout:

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

The control mode is chosen by **Pulse** switch on the speed gate control board (Fig. 9). Upon delivery the switch is in **ON** position, which corresponds to pulse speed gate mode.



Attention!

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

Shift the switch into **OFF** position to place the speed gate into potential control mode. Control mode will be changed after speed gate being powered.

Pulse control mode

The mode is used for speed gate operation from RC-panel, wireless remote control and ACS-controller with the outputs supporting pulse control mode. Speed gate operation at pulse control mode is described in Table.7.

Control signal duration at sending control command to control inputs is to be not less than 100 ms. The initial passage waiting time is 8 seconds and it is independent of control signal (pulse) duration.

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 shifting from 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:

Push the corresponding button on RC-panel to send control signals from the RC-panel / WRC to the signal active front. Pressing the button corresponds to the low level of the signal; non-pressing the button corresponds to the high level of the signal.

Potential control mode

The mode is used for speed gate operation with ACS-controller. The outputs of the ACS-controller are to support potential control mode. Speed gate operation in potential control mode is described in Table.8.

Control signal duration at sending control command to control inputs is to be not less than 100 ms. The passage waiting period equals the control signal duration. i.e. that if by the moment of passage completion in the permitted direction, there is a low-level signal at the input of this direction, the speed gate remains open in this direction.

Control command sending algorithm is given in Appendix 2. Sending a low-level signal to *Stop* input, both directions are locked for signal duration time independently of signal levels at *Unlock A* and *Unlock B* inputs. Removing low-level signal from *Stop* input, the directions shift into the modes, according to signal levels at *Unlock A* and *Unlock B* inputs.



Note:

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

5.2.7 Speed gate operation algorithm

Speed gate operation algorithm in pulse control mode in case of single passage in one of the directions:

1. A command (control signals combination) for single passage performance 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 creates a command for the swing panels motor drive to open the passage. The **Time of holding in unlocked state** (8 seconds by default) countdown begins.
3. The speed gate swing panels open in the chosen direction. The user can pass through the speed gate in the chosen direction.
4. Any movement detected in the passageway is registered as a completed passage. *PASS A* or *PASS B* relay output, corresponding to the passage direction, is activated for 80 ms. User's location in the passageway is monitored by the intrusion detectors.



Note:

In order to prevent user contact with the turnstile doors, a "safe" zone is allocated inside the passage area. 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 area of the **PERCo-ST-01** turnstile 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 he gets into a safe zone (zone, in which it is impossible to get in contact with the swing panels) and the control board microcontroller sends a command for the motor drive to close the swing panels. The swing panels get closed.
6. If at the moment of passage performance by the first user, another user's passage has been 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.
7. If at the moment of passage performance, another user's passage has been authorized **in the opposite passage direction**, then after the first user's passage completion the swing panels will be closed and open in the opposite direction for the second user to pass.



Note:

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

8. If the user does not enter the passageway during the **Time of holding in unlocked state**, the swing panels will close the passage lane.
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 released after receiving a signal from *PASS* output for the same direction.

5.3 Operating devices

Speed gate operation can be performed through the following devices: RC-panel / WRC; ACS-controller, Fire Alarm device. These devices can be connected to the speed gate separately, simultaneously or in any combination with each other.

In case several operating devices are connected simultaneously there can be a control signal overlap. In this case speed gate will operate according to the command, generated by the signal combination (Appendixes 1 and 2).

5.3.1 RC-panel connection

RC-panel is connected with a flexible multicore cable to *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).

Standard RC-panel orientation regarding speed gate sections¹². If the operator's workspace is located on the opposite side regarding *Master* section, it will be more convenient to change the RC-panel wires, which are connected to *Unlock A* and *Unlock B* contacts, as well as *Led A* and *Led B* respectively (Table 4).

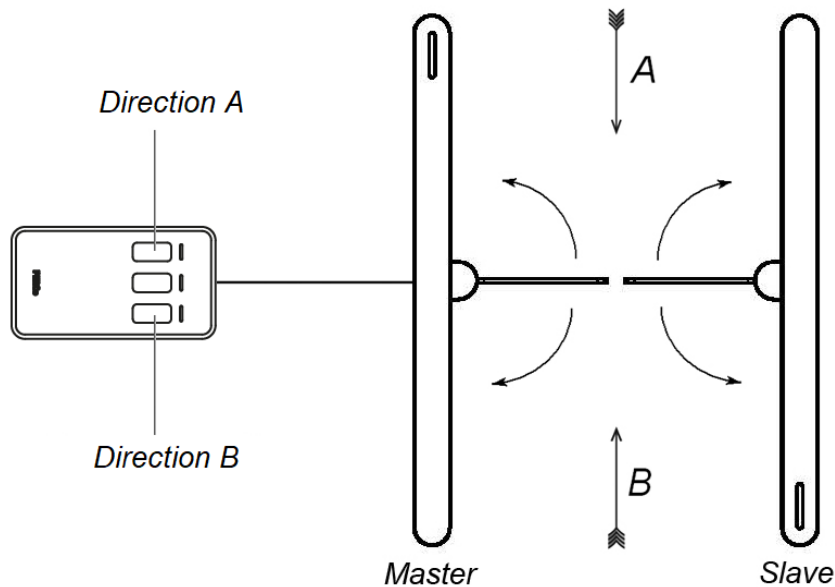


Figure. 12 Standard RC-panel orientation regarding sections



Note:

- When the turnstile functions as a part of the ACS it is recommended to connect the RC to the ACS controller according to the operational documentation.
- WRC is connected to *Unlock A*, *Stop*, *Unlock B* and *GND* contacts of the **X2** terminal block and to +12V contact of the **X3** terminal block.

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

№	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 unlocking device to control board *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 between *Fire Alarm* and *GND* contacts of the control board is to be installed. This jumper is installed by default.

When a control signal is applied to the *Fire Alarm* input and held for at least 2 sec¹, the speed gate switches to “*Fire Alarm*” mode.

¹ If the duration of the Fire Alarm signal is less than 2 seconds, the turnstile will not switch to Fire Alarm mode and will remain in normal operation mode.

- In this mode the following operations take place speed gate swing panel open in the direction, chosen with FA_Dir switch (Fig.9).
- Green passage permission indicators of the top cover and the central post indication blocks switch on to the flashing mode with a period 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 turnstile will be open for another 3 sec, after which the swing panels will close and the turnstile will return to normal operation.

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

5.3.3 Operation from the ACS

Operating as a part of the ACS, the speed gate can serve as an operating device. Speed gate also provides an opportunity of built-in proximity card readers installation under the section top cover.

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

5.4 Optional devices connected to the speed gate

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

- *PASS A*, *PASS B* – for connection to ACS-controller inputs (Sect. 5.4.1).
- *ALARM* – for siren connection (Sect. 0).
- *Light A* and *Light B* – for external indication blocks connection (Sect. 5.4.3).

5.4.1 PASS outputs

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

Relays have normally open contacts. The *Common* relay contact is not connected to the speed gate power supply return. Normalized voltage is not supplied to relay winding.

Outputs are activated at passage registration through speed gate in a corresponding direction. During the activation process, voltage is supplied on relay winding and relay contacts get closed. Voltage supply to relay winding is indicated by the red LED light on the control board by the corresponding relay (if the jumper on the control board is installed on **XP3** output).

Pass elements – 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

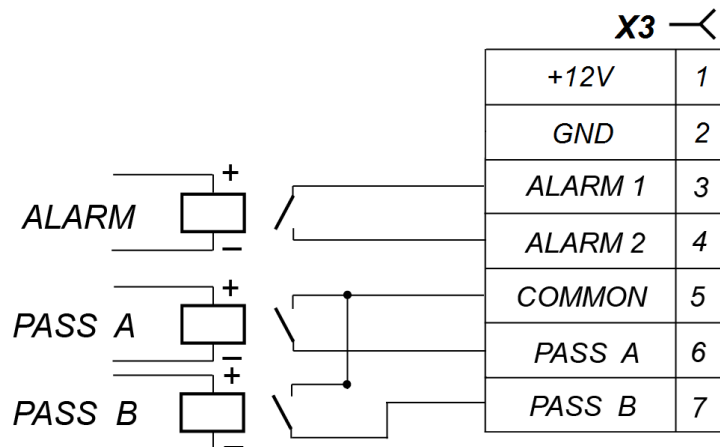


Figure. 13 PASS A, PASS B and Alarm pass elements

5.4.2 Siren

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

Normalized voltage is not supplied on relay winding and the relay contacts are open. Output is activated when intrusion detectors register an unauthorized passage. 9.4). During the activation process, voltage is supplied on relay winding and relay contacts get closed. Voltage supply to relay winding is indicated by the red LED light on the control board by the corresponding relay (if the jumper on the control board is installed on **XP3** output).

Pass elements – 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

Maximum consumption current of the siren, connected to +12V contact of the **X3** connector block on control board should not exceed 0.3 A.

5.4.3 External indication

External indication blocks for corresponding passage directions are connected to *Light A* and *Light B* outputs. Outputs have the full contact block: Normally open, *NO* normally closed and *O* common contacts. Connection to the outputs is performed through the corresponding contacts of the **X4** terminal block.

With passage grant indication in A/B direction the relay of the corresponding *Light A / Light B* passage direction is activated (voltage is supplied to its winding) and normalized at passage denial indication. Power supply to relay winding can be indicated by the red LED light on the control board by the corresponding relay.

Pass elements for *Light A* and *Light B* – relay transfer 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

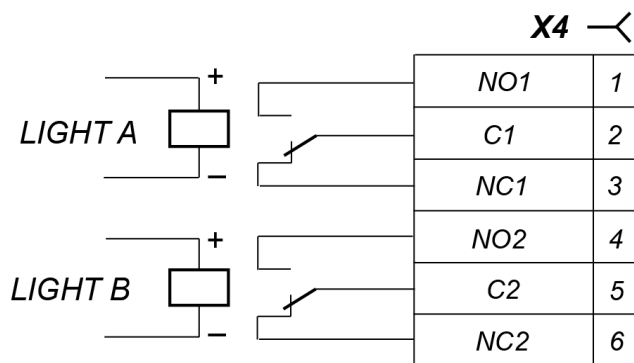


Figure. 14 Light A and Light B pass elements

6 MARKING AND PACKAGING

Each turnstile's section has a marking. The label is on the inside surface of the top duct of the section. To access the marking label, open the section top cover (Sect. 8.9.6). The label has: trademark, the producer's contact details, section name and product number, the year and the month of production, power voltage and the turnstile's power intake.

Speed gate *Master* section and double-sided section also have the label on the internal surface of the central post cover plate (2). Remove the post cover plate to access the label (Fig. 19). The label contains speed gate connection layout similar to the one shown in Fig.18.

Speed gate in a standard delivery set is packed in transportation boxes, protecting it from being damaged during transportation and storage. The number of boxes depends on the ordered delivery set.

The transportation boxes overall sizes:

ST-11: box with the sections ST-11/M and ST-11/S	157×56×108 cm
STD-11: box with the two-sided section	157×34×108 cm

STC-11, SDC-11 (set of section top covers)	139×15×18 cm
ATG-300 (panels set)	66×44×8 cm
ATG-300H (panels set)	104×44×8 cm
ATG-425 (panels set)	66×56×8 cm
ATG-475 (panels set)	66×61×8 cm

Transportation boxes weight (gross):

ST-11 : box with the sections ST-11/M and ST-11/S	max 160 kg
STD-11 : box with the two-sided section	max 105 kg
Box with STC-11 (set of section top covers)	max 19 kg
Box with SDC-11 (double-sided section cover)	max 14 kg
Box with ATG-300 (set of swing panels).....	max 16 kg
Box with ATG-300H (set of swing panels)	max 21 kg
Box with ATG-425 (set of swing panels)	max 19 kg
Box with ATG-475 (set of swing panels)	max 22 kg

7 SAFETY REQUIREMENTS

7.1 Installation safety requirements

The turnstile installation is to be carried out by the persons that have studied this Manual and got through the safety brief, complying with the rules of the electrotechnical and installation procedures.

Power supply unit must be operated with observance of safety requirements mentioned in its operational documentation.



Attention!

- All works should be performed only after the power supply is switched off and disconnected from the AC mains.
- Only serviceable tools should be used for installation.
- Sections unpackaging and relocation, section top cover and swing panels installation are to be carried by at least two professionals.
- Wearing protection gloves is obligatory! Housing details made of stainless steel may contain sharp edges.
- During the installation, before the sections are fixed to the floor, prevent them from falling down.
- Before the first speed gate power-up, make sure installation and all connections are done properly.

7.2 Operation safety requirements

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 supply voltage that does not comply with the requirements given in Sect. 3.

Power supply unit must be operated with observance of safety requirements mentioned in its operational documentation.

8 INSTALLATION

Speed gate installation should be performed with observance of safety rules described in Sect.7.1.

The turnstile installation is an important operation that largely define the capacity and the operational life of the equipment. Speed gate installation should be carried out by, at least, two qualified professionals who have accurately studied the following manual. Carefully study this section before the installation and follow it thereafter.

**Attention!**

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

8.1 Installation details

It is recommended:

- to mount the speed gate on a steady and level concrete (grade 400 or higher, strength class B22.5), stone or similar foundation at least 150 mm thick.
- to level the foundation so that the anchoring points of the speed gate are flush with the surface (check it with a level).
- to apply reinforcing elements (450×450×200 mm) in case the speed gate is to be installed on a less steady foundation.

**Attention!**

During speed gate section installation leave a 70 mm space between the section rear panel and the wall in order to provide the possibility of central post rear panel disassembly.

8.2 Use the following tools during the installation:

- 1.2÷1.5 kW hammer drill;
- Ø16 mm hard-alloyed drill bit for anchor bolt sleeves;
- floor chaser for cable raceways;
- PH2 Philips screwdriver;
- S17 open-end and socket wrenches;
- SW2, SW4, SW5 Allen wrench;
- level;
- measuring tape 2 m;
- slide caliper.

**Note:**

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

8.3 Cable length

The cables used during installation are mentioned in table 5.

Table. 5 Cables used at the installation

No	Equipment	Cable length, m, max	Cable type	Cross-section, mm, min	Example
1	Power supply	10	Twin cable	1.5	AWG 15; HO5VV-F 2×1.5
		20	Twin cable	2.5	AWG 13; HO5VV-F 2×2.5
2	- Fire Alarm device - Optional equipment to control board input and output	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 order

Installation order is described with regards to recommendations, given in Sect. 8.1. Installation tools are listed in Sect. 8.2. Figure numbers are given in accordance with Fig. 6 and 7. Speed gate connection layout is given in Fig. 18. Types of cables used are stated in Sect. 5. The example of **ST-01** and **STD-01** connection layout with extra passage lane arrangement is shown in Fig. 17.

Follow this order to install the speed gate:

1. Install the PS on a designated area in accordance with the instruction given in the operational documentation.



Attention!

- While relocating the section, it is forbidden to hold it by the top cover.
- Installation and fastening of the speed gate sections should be performed only after cabling in cable channels and inside of the speed gate being finished.
- Be careful while dismantling the section pieces that has not been fixed on a mounting surface. Prevent the section from falling down and its pieces from being damaged.

2. Determine the installation location for *Master* and *Slave* sections and for double-sided section if needed. However, it is necessary to consider the sections relative positioning: the *Master* section panel (side of the double-sided section) should always been placed opposite to the *Slave* section panel (side of the double-sided section).
3. According to the blueprints in Fig.15-16, mark and drill holes for anchor sleeves on the mounting surface for fastening speed gate¹ sections. Use Ø16 mm hard-alloyed drill bit. The drilling depth for standard M10 anchor should be 65 mm. Insert the anchor sleeves in the holes so they are flush with the floor surface.
4. Prepare cable channels in the floor:
 - Channels for cabling from external devices (PS, RC-panel or ACS-controller, Fire Alarm device etc.) – to input holes of the *Master* section and input towards double-sided *Master* section;
 - Channels that link input holes of the opposite sections (double-sided sections) of one passage lane – for routing DC and CAN cables.



Attention!

Passage lanes that are limited by one-sided sections and/or sides of double-sided sections are standalone devices which are not connected to each other.

Master and *Slave* sides of one double-sided section are electrically independent as they belong to different passage lanes.

5. In the cable channels, route cables from external devices to the sections installation location. Also, route flexible conduit in the cable channel between the opposite sections (sides of the sections) for each passage lane. 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 flexible conduit for cabling, then it is necessary to route DC and CAN cables prior to the sections installation. These cables are located under the housing of the *Slave* section central post (side of the section). To do so it is necessary to unpack the *Slave* section, dismantle the housing of the central post (see Fig. 19), take out DC and CAN cables and disconnect them from the drive control board. There are numbers on the cut-off ends of the core 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. 8.9.1).
 - Dismantle the front panels of both side posts (10) (Fig.20, Sect. 8.9.2).
9. Install the speed gate section on the anchor sleeves. Do not work alone!
10. Route cables through the hole located in the base of the *Master* central post: from PS (16), RC-panel (17), Fire Alarm device (18) and from the optional equipment. Route DC (19) and CAN (20) cables from the *Slave* section (side of the section) or a flexible conduit for cabling.

¹For the hole spacing use the cardboard template (from the **ST-11 set**). Use the same template for the hole spacing of the two-sided sections **STD-11**.

11. Fix the section on the mounting surface by using eleven M10 bolts with washers. Align the vertical position of the speed gate section with a level. Minimum angle measured from the vertical of the section should not exceed 0.5°. It is allowed to use mounting gaskets.

**Note:**

Points 12-16 should be applied for **STD-11** double-sided section installation.

12. Unpack and install the double-sided section. Proceed as described in points 7 - 9 (for the both sides of the section) orient the two-sided section so the *Slave* side is opposite to the installed *Master* section.
13. Take DC and CAN connection cables out of the central post of the double-sided section from the *Slave* side (if they hadn't been routed in the cable channel earlier). Lead them through the hole that is located in the post base plate. Route cables with a flexible conduit to the *Master* section.
14. Route cables for controlling the second passage lane by using the hole located in the base plate of the double-section central post (from the *Master* section side): from PS, from RC-panel or ACS-controller, from the Fire Alarm device and from optional equipment. Route DC (16) and CAN (17) cables from the *Slave* section (side of the section) or a flexible conduit for cabling.
15. Align the vertical position of the double-sided section and fix it on the mounting surface by using 14 M10 bolts with washers (see point). 11).
16. Install other double-sided sections if needed (points).12 - 15).
17. Unpack and install the speed gate *Slave* section. Proceed as described in points 7 - 9.
18. Take DC and CAN cables out of the *Slave* section (if they hadn't been routed in the cable channel earlier). Lead them through the hole that is located in the post base plate. Route cables with a flexible conduit to the *Master* section.
19. Align the vertical position of the section and fix it on the mounting surface (see point). 11).
20. Connect cables to the control board of the first passage lane according to the speed gate electric connection layout (see Fig. 9 and Fig.18). The control board is located in the bottom side of the *Master* section central post.

**Note:**

DC (2) and CAN (4) cables should be connected to the **X5** terminal blocks of the *Master* section control board and to **X1** terminal blocks of the *Slave* section drive board in accordance with the conduit marking (see Fig. 18).

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

**Attention!**

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

The selection of the readers, its purchase and installation into the product is carried out by the customer (installer) in accordance with the checkpoint design and the characteristics of the access control system and the control controller. It is possible to install readers as manufactured by *PERCo (IR13, IR19)*, and third-party manufacturers.

Readers must meet the following requirements:

overall dimensions (length × width × height) max 155×68×28 mm
 read range min 40 mm

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

Use the double-sided 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 the read range. Carefully route reader cables through the top duct into the central post where the ACS-controller cable is to be led through the default holes. Cables should not be routed between or near the holes used for fastening the section top cover. This will prevent the cables from damage. Use self-adhesive cable tie mounts for cable fastening. It is prohibited to fix cables to the internal wiring cables and to the control boards of the intrusion detectors. It is also prohibited to route cables near the control boards where the detectors are located.

22. Unpack the glass swing panels (4) and mount them (Fig. 21, Sect.8.9.3).
23. Mount swing panel cover plate (3) from installation kit (Fig. 21, Sect.8.9.4).

24. Mount front panels (10) (Sect. 8.9.2). 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.8.9.5) (included in the installation kit).
 26. Install section top covers (6) (see Fig. 23, Sect.8.9.6).
 27. Use switches on the *Master* section control board (side of the section) (see Sect. 0) in order to:
 - Set speed gate operating mode by using the **Pulse** switch.
 - Select the rotation direction of swing panels as an alarm reaction to the Fire Alarm device. Use the **FA Dir** switch.
 - Set the size of swing panels that will be mounted for the passage lane by using **Size1**, **Size2** switches (see Table 2).
 28. Perform a test run as described in Sect. 9.1.
 29. If needed, adjust the level of swing panels relative to each other and set the speed gate into training mode, then close the swing panels manually as described in Sect. 8.7.
 30. Check the speed gate correct operation by sending commands from the RC-panel (see Sect. 9.2, 9.3).
 31. Execute the same operations as in 20 – 30, for the other passage zones of the turnstile.
 32. Mount central post cover plate (2) (Sect. 8.9.1).
- The speed gate is ready for operation once the installation and testing are finished.

8.5 Mounting surface marking layouts

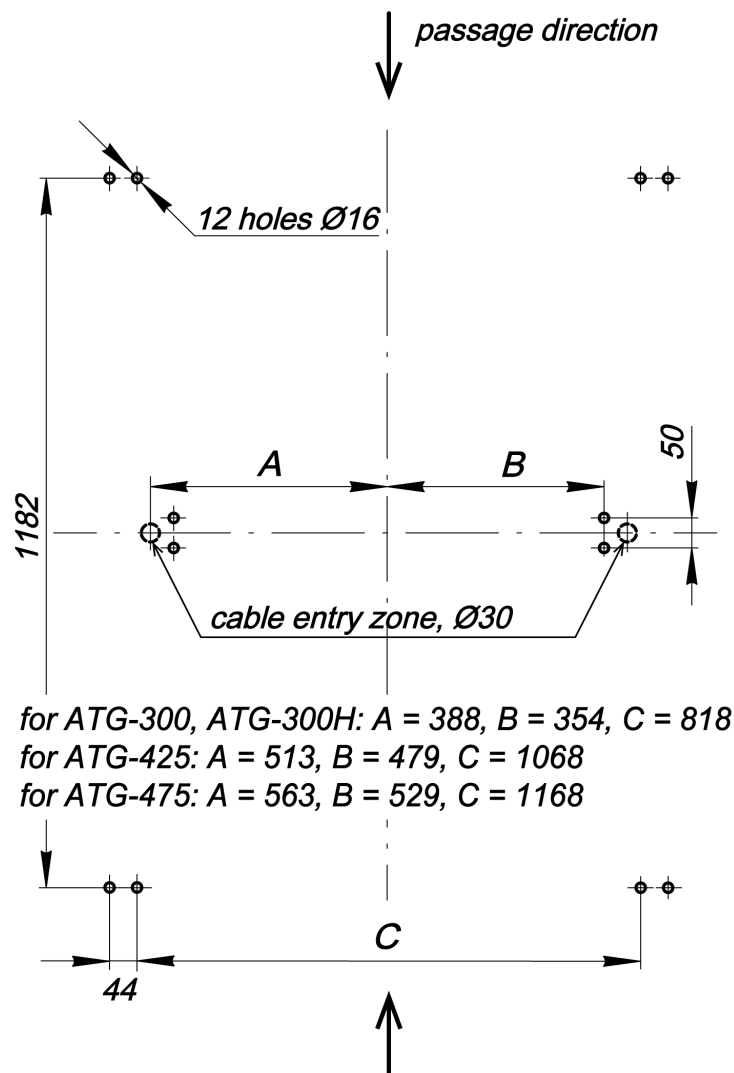


Figure. 15 Speed gate marking layout

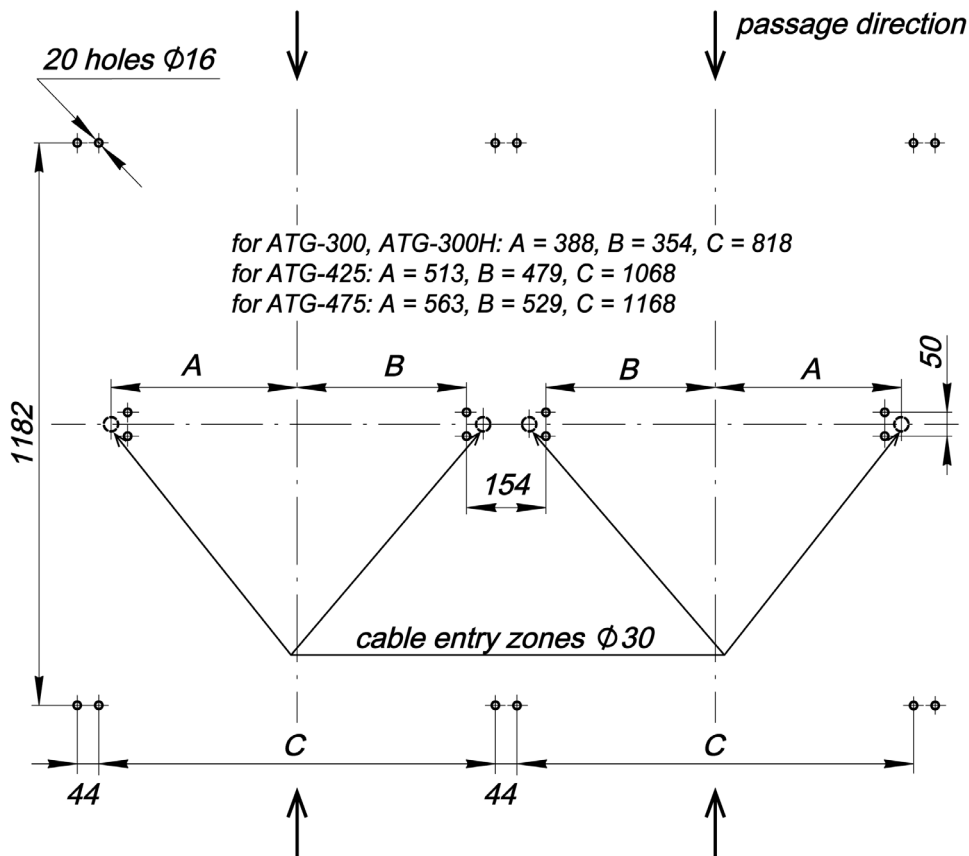


Figure. 16 Speed gate and double-sided section marking layout

8.6 Speed gate wiring diagram

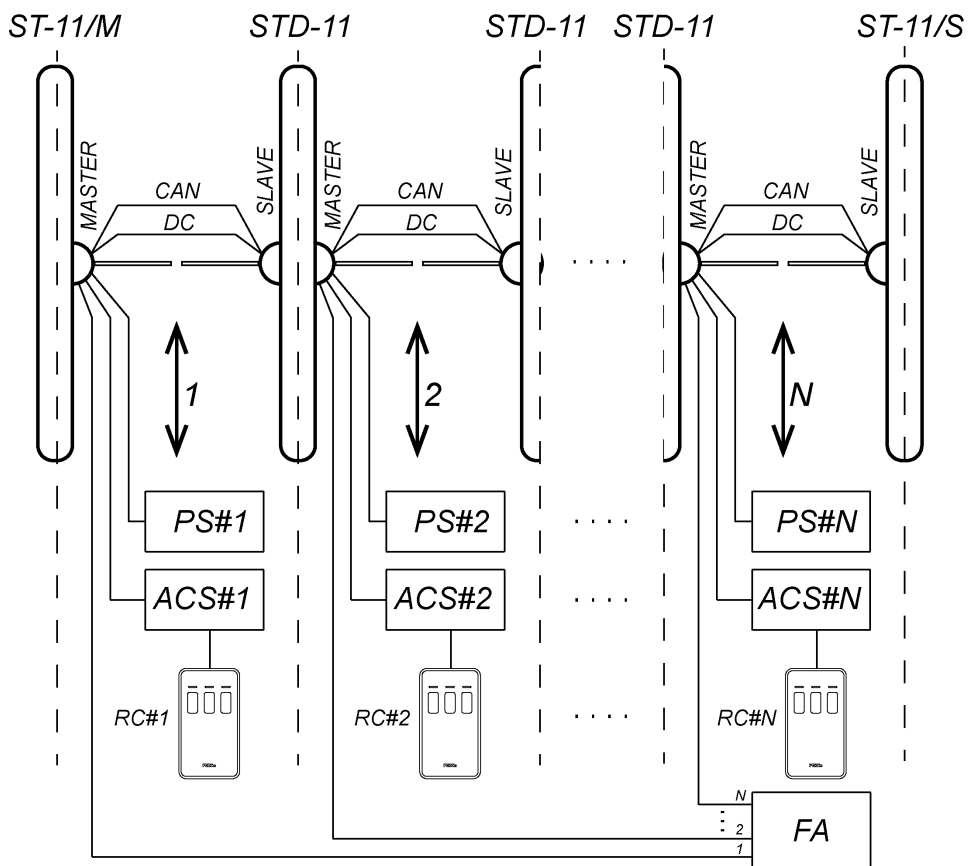


Figure. 17 Diagram of connections for the ST-11 turnstiles and the two-sided sections STD-11 to organize the check-point with several passage zones

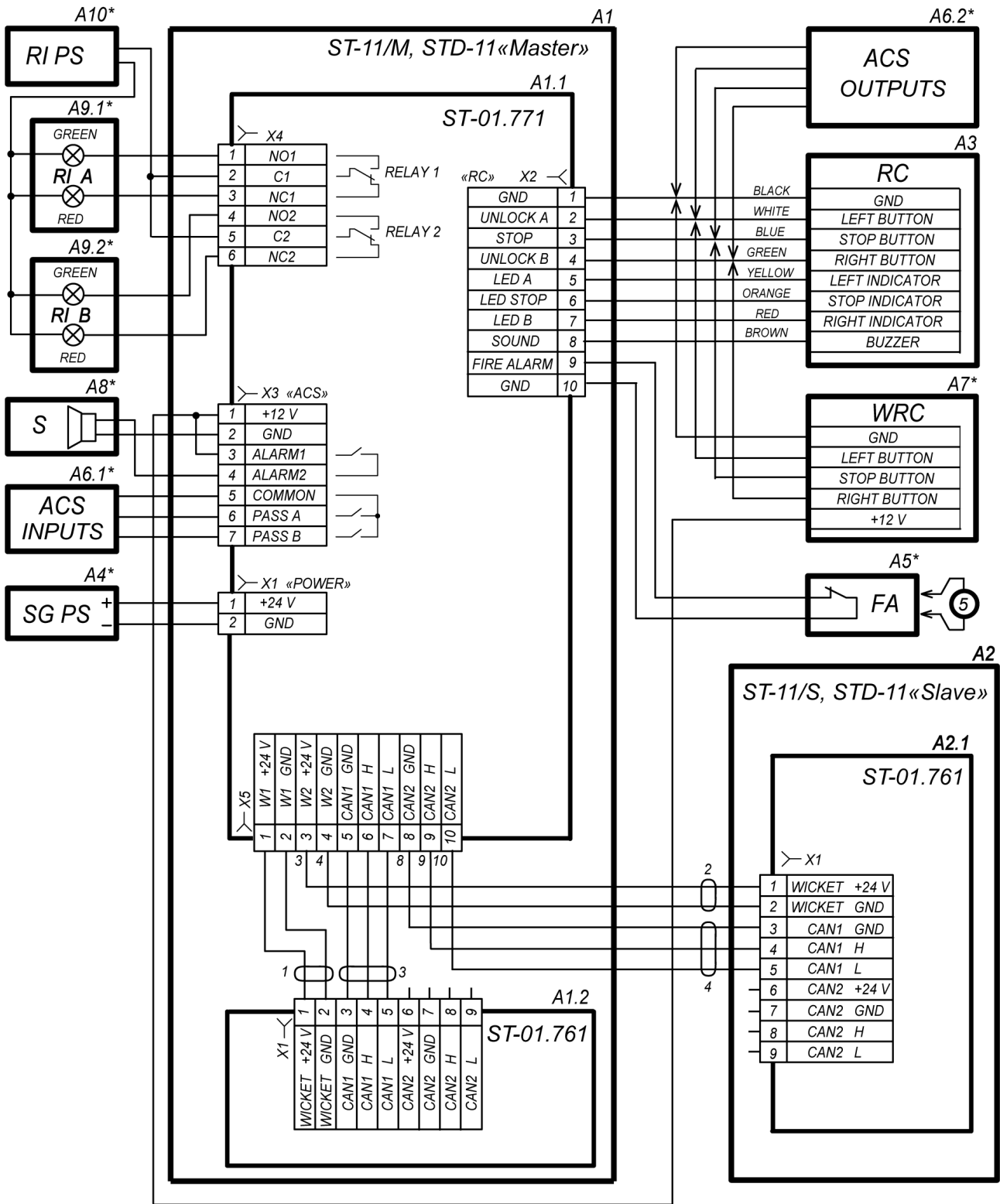


Figure. 18 Speed gate wiring diagram¹

¹The list of elements of the diagram are indicated in table 6.

The equipment marked (*) is not included in the standard delivery set.

WRC is connected to *Unlock A*, *Stop*, *Unlock B* and *GND* contacts of the **X3** terminal block.

Table 6. List of the elements of speed gate wiring diagram

Legend	Name	Nr, pc.
A1	<i>Master</i> section (section side)	1
A1.1	Control board	1
A1.2	Drive control board, <i>Master</i> section (section side)	1
A2	<i>Slave</i> section (section side)	1
A2.1	Drive control board, <i>Slave</i> section (section side)	1
A3	RC-panel	1
A4 ¹	Speed gate power supply	1
A5 ¹	Fire Alarm signal sending device	1
A6.1 ¹ , A6.2 ¹	ACS-controller	1
A7 ¹	Wireless remote control	1
A8 ¹	12V DC siren	1
A9.1 ¹ , A9.2 ¹	Remote indication block	2
A10 ¹	Remote indicators power supply	1
1, 2	DC connection cable	2
3, 4	CAN connection cable	2
5	Wire jumper in case there is no Fire Alarm device (A5). Installed by default.	1

8.7 Training mode

The mode allows adjusting manually speed gate swing gates initial position. Proceed as follows:

- 1 Turn off the speed gate power supply.
- 2 Switch the **R2** switch to the **ON** position (**R1** switch should be in **OFF** position).
- 3 Arrange the swing panels into the required initial position and adjust them relatively to each other.
- 4 Switch on the speed gate 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 in the training mode the speed gate switches into the “*Emergency*” mode, that indicates the incorrect initial position of the swing panels. Turn off the speed gate power supply in order to exit the “*Emergency*” mode. In order to continue with the training mode, install the swing panels into the initial (locked) position and turn on the speed gate power supply.

- 5 Turn off the speed gate power supply.
- 6 Switch the **R2** switch to the **OFF** on the control board.
- 7 Switch on the speed gate 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.

¹ The equipment is not included in the standard delivery set.

8.8 “Auto-opening in the selected direction” mode

This additional operating mode is used, when it is required to organize free entrance (or exit) keeping the swing panels in closed position and to prevent an unauthorized access in the opposite direction (e.g. in the sales area of the store etc.).

Selection of the operating modes can be performed by switching **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 operating mode allows to organize the free passage in one preselected direction, when the swing panels automatically open and close after the passage. In the direction selected for the “Auto-opening” mode, if the speed gate is not occupied for passage from the opposite direction, the indicator (passage granting) is constantly lit, but in the other direction of the passage the red indicator (passage denial) is lit. In case if the passage from the opposite direction is authorized (from RC-panel, WRC-kit or ACS-controller), the “Auto-opening” mode is turned off for the time of this passage.

Mode operation algorithm:

- 1) By default, the green indication is on in the “Auto-opening in the selected direction” mode in free passage direction and the red indication is on in the other direction. RC commands or ACS-controller commands for the passage in the “Auto-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 the visitor walks through the passage lane in the “Auto-opening in the selected direction” mode direction. The swing panels open in this direction, and when the passage is completed, the intrusion detectors send a command to the controller and the swing panels automatically close. The indication stays in its initial state.
- 3) When the passage is performed in the direction opposite to “Auto-opening in the selected direction” mode direction – the operation algorithm is equal to the ordinary algorithm (Sect.5.2.7). During the authorized passage, the “Auto-opening in the selected direction” mode switches off for the passage waiting period. If the “Free passage” mode is applied for this direction, then the passage waiting period will be deactivated while this mode is applied.
- 4) All other cases such as simultaneous passage in both directions are considered as abnormal and then the controller will generate an emergency signal and will close the swing panels.

8.9 Assembly and disassembly of the 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 damage, place them on an even and steady surface, prevent them from scratches.

8.9.1 Central post cover plate

To remove the central post cover plate (2), pull the cover plate down along the post, take it aside from the post, bringing the hooks from slots in the central post (Fig. 19).

Central post cover plate is to be installed in the reverse order. The cover plate will take its place due to the pressure of the spring-loaded tongue at the bottom of the inside of the cover plate.

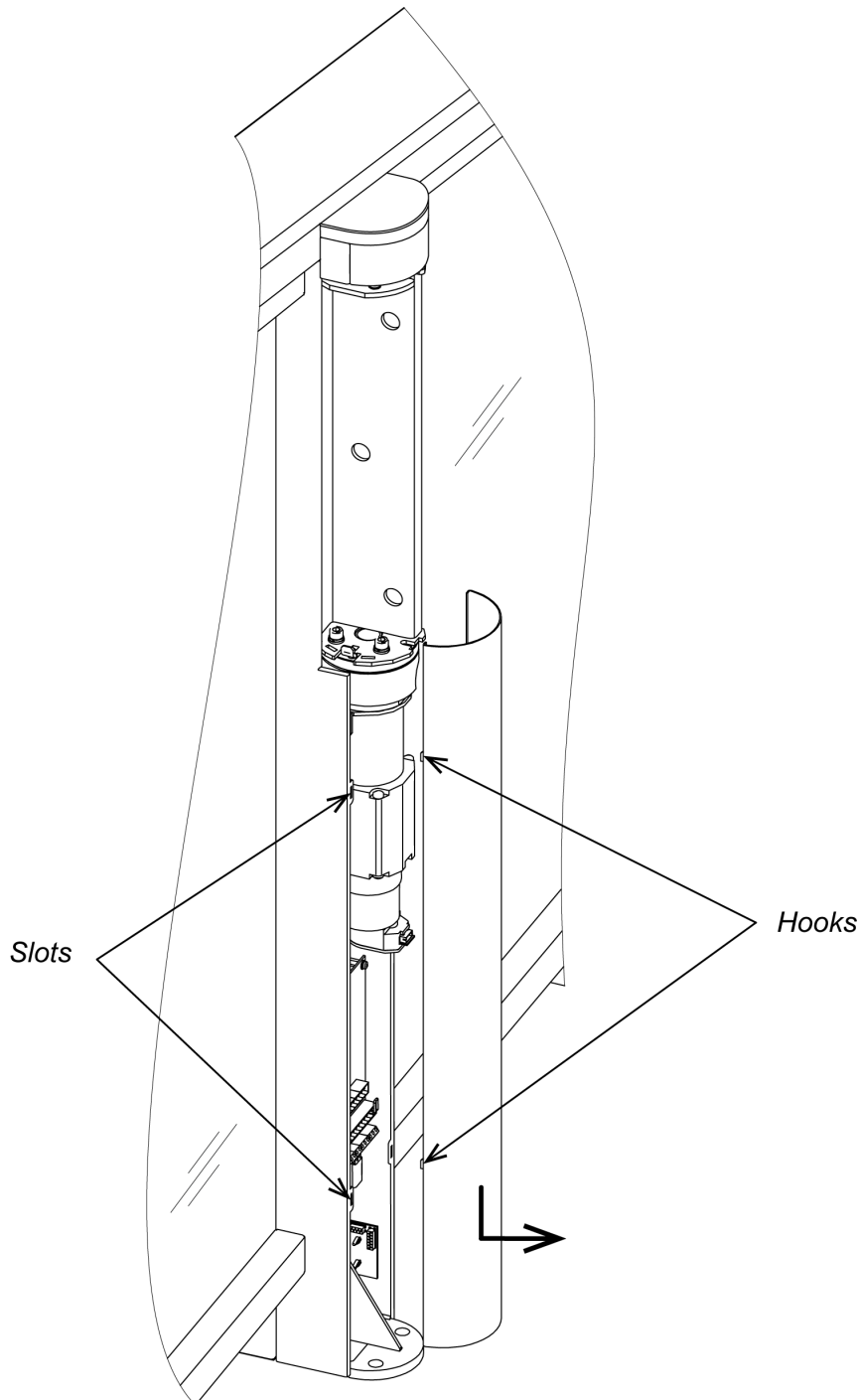


Figure. 19 Central post cover plate disassemble

8.9.2 Front panel of the side post

Remove the side post front panel (10), moving it up along the post and then pull it, bringing the hooks from slots in the side post (Fig. 20). Be careful not to damage the connection cable! Disconnect the connection cable output from the front-end indication block.

When installing the side post front panel press it down, put all the cover plate hooks into the slots of the post and release. The panel will take its place due to the pressure of the spring-loaded tongue at the bottom of the inside of the cover plate.

It's not necessary to take off the section top cover (6) before the installation (dismantle) of the side post front panel (see sect. 8.9.6).

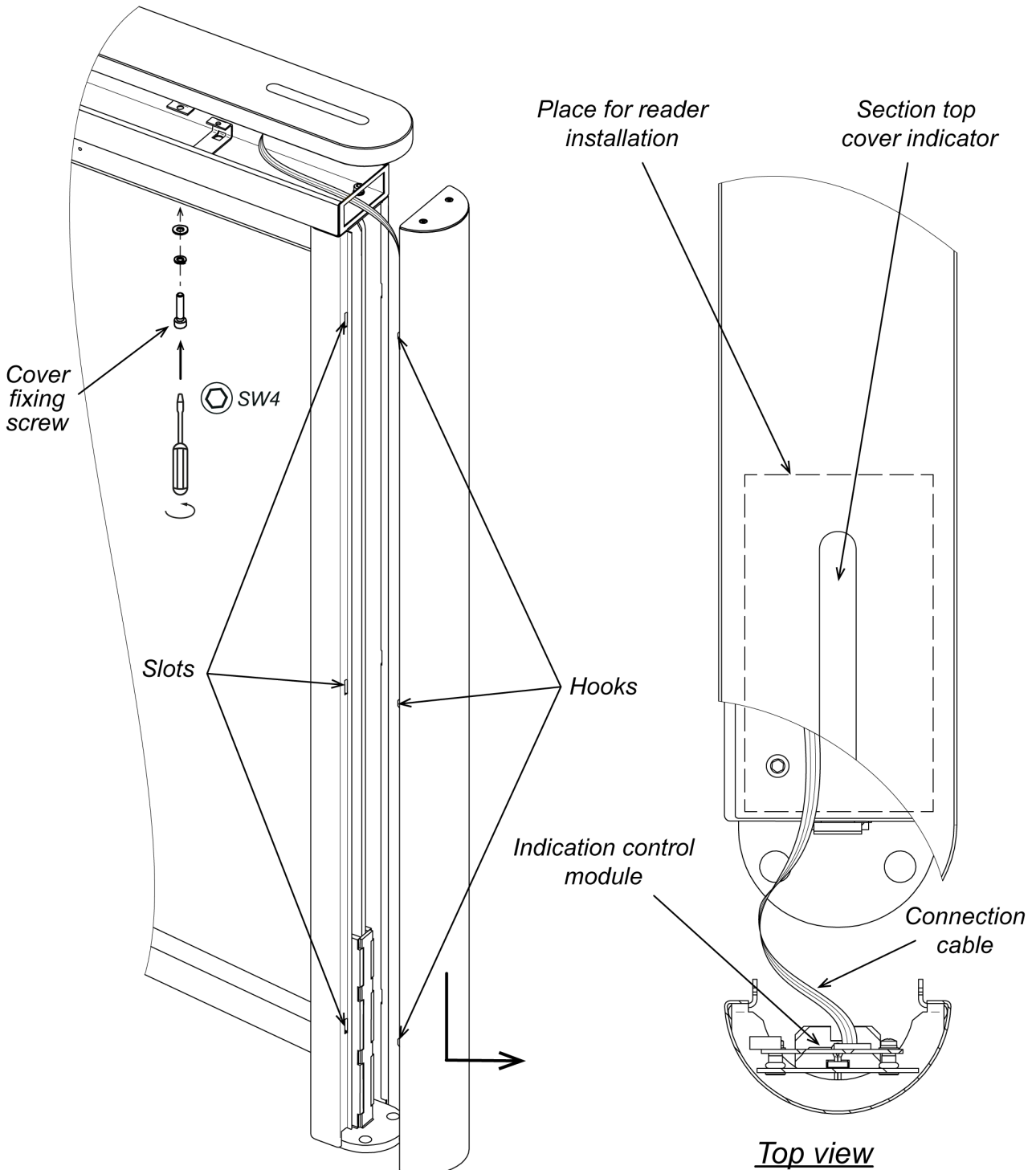


Figure. 20 Side post front panel disassemble
(the dashed line shows the location of the reader)

8.9.3 Swing panel

Two people shall install and remove the swing panels. The swing panel is fixed to the rotating support in three places with M10×30 bolts, 10 washers, plastic bushing and M10 screws (Fig. 21). Use S17 open end wrenches.

8.9.4 Swing panel cover plate

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

1. Turn fully the rotating support of swing panel in the clockwise direction.
2. Assemble one of the cover plate components on the rotating support. In order to do that, mount the cover plate on the upper plate of the rotating support through the slots in the upper part of the cover plate. After that, shift the cover plate down to the end, mounting the bottom cover plate mortise into a tenon, located in the bottom part of the rotating support (Fig. 21).
3. Fix the installed part of the cover plate with a Philips screwdriver to the rotating support with two M4×10 screws with washers from the delivery set.
4. Turn fully the rotating support of swing panel in the counterclockwise direction. Mount the second part of the cover plate likewise.
5. Check the gaps between swing panel and its cover plates, between swing panel cover plates and central post cover plate, if needed, loosen the M4×10 screws and adjust the bottom part of the panel cover plate. Tighten the screws.

Panel cover plate removal is performed in a reverse order. Prior to removal, disassemble of central post indication block is required (see Sect. 8.9.5).

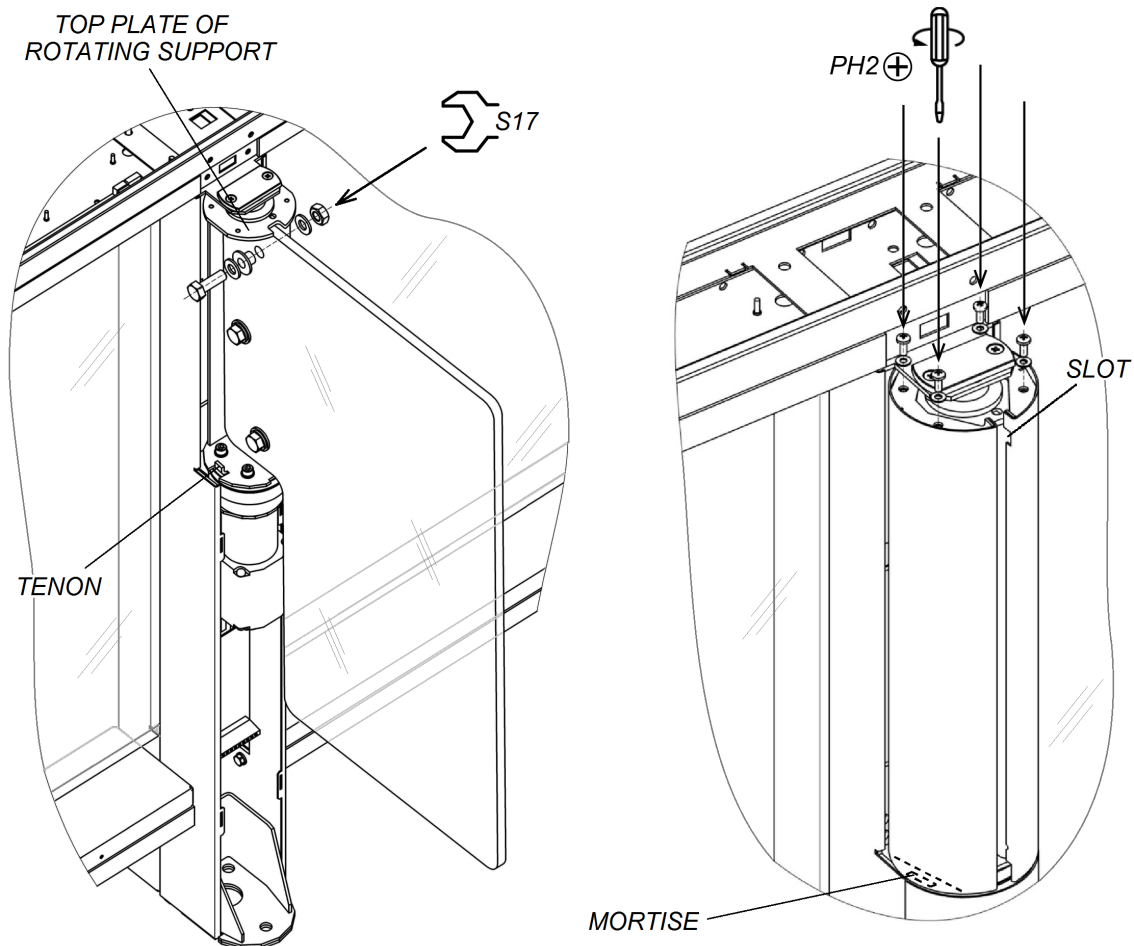


Figure. 21 Swing panel and its cover plate

8.9.5 Central post indication block

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

1. Pull the cable from 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** output.
3. Install the indication block on the surface, located above the rotating support of swing panel and using an SW4 Allen wrench fix it on the post top duct (7), using two M5×16 screws with washers from the delivery set.
4. Check the evenness of the gap between the indications module and the swing panel cover plate, loosen the M4×10 screws and tighten them if needed. Tighten the screws.

Remove the central post indication block in a reverse order. Disassemble the section top cover (6) and two shielding plates prior to removal (Sect. 8.9.6, Fig. 23).

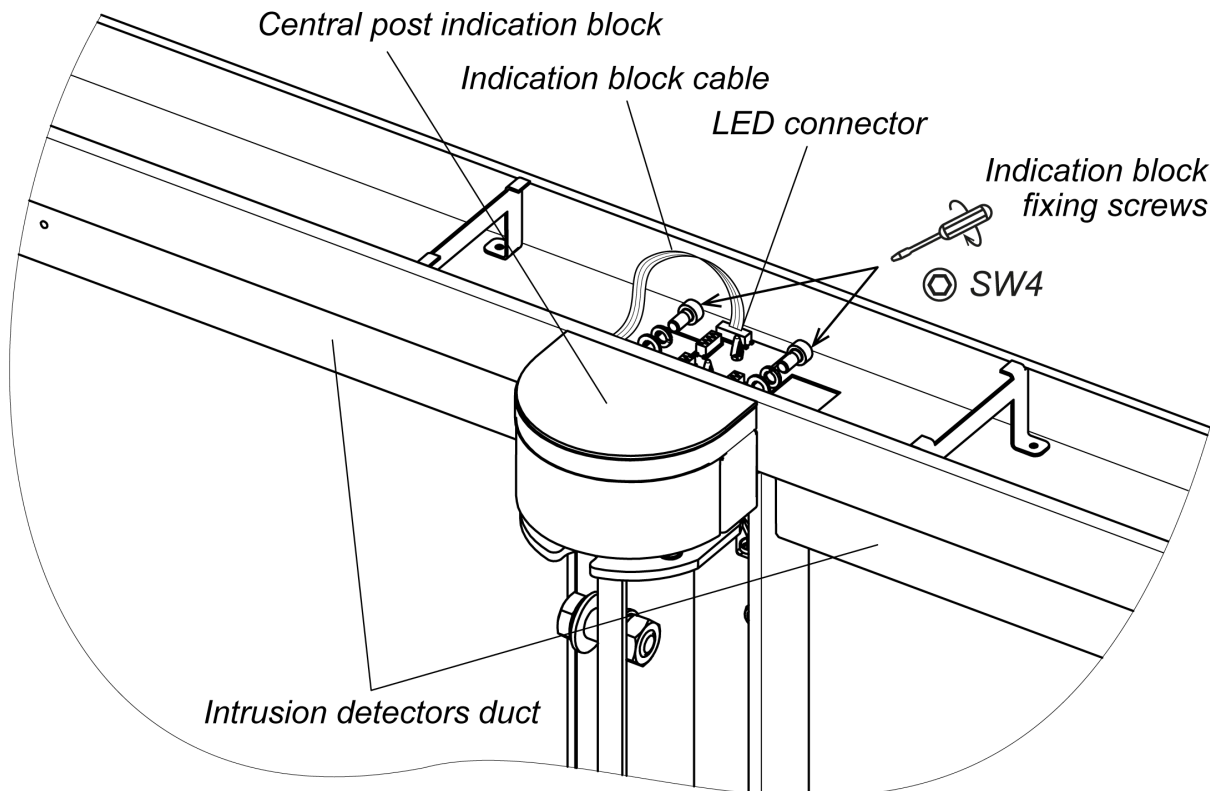


Figure. 22 Central post indication block installation

8.9.6 Section top cover

Before installing the top cover (6) it's necessary to check that all the necessary connector cables are connected to the indication units (sect. 8.9.2, 8.9.5).

Sections' top covers installation order (fig.23):

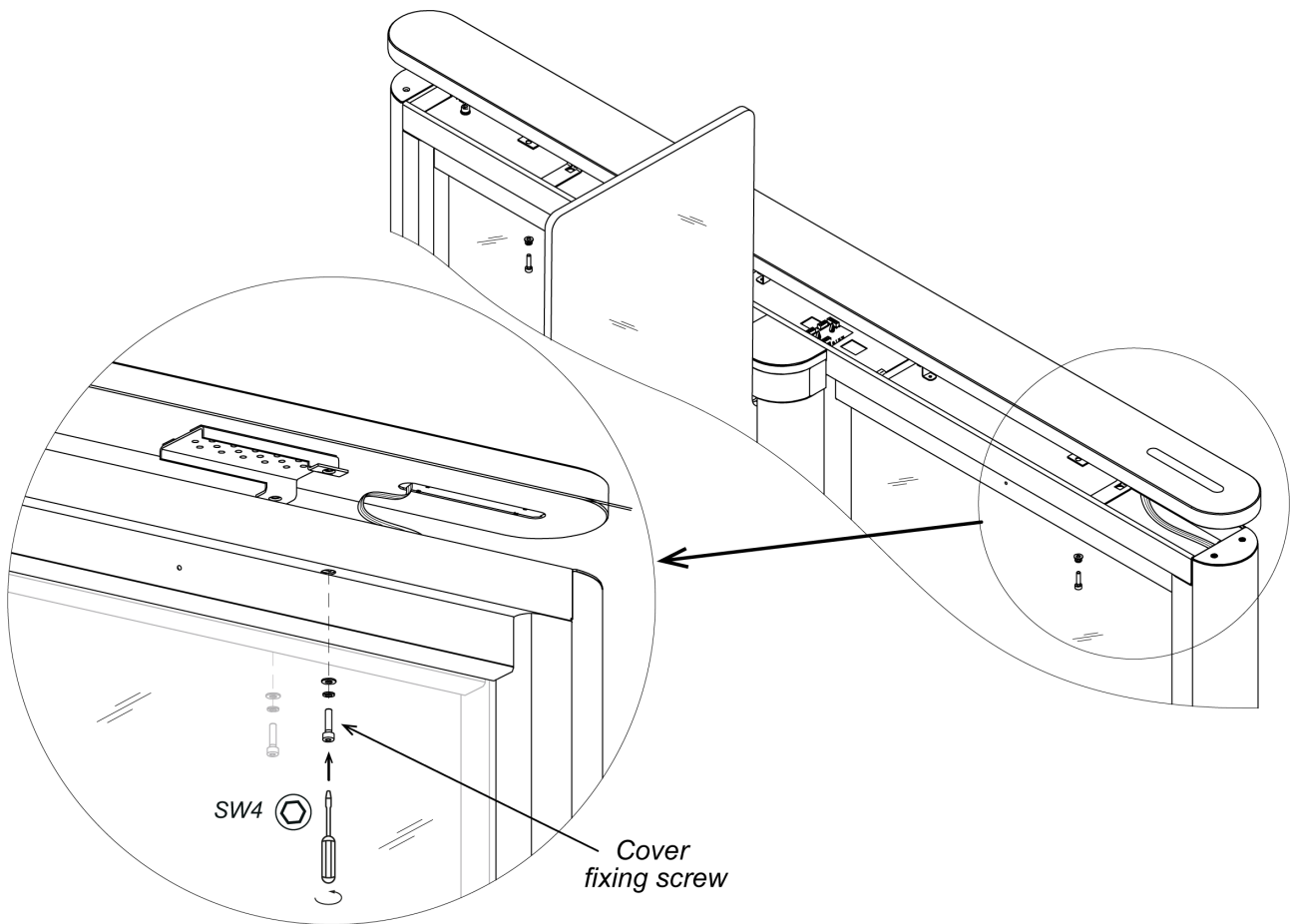


Figure. 23 Top cover installation

- Connect the connection cable from the indication control module ("PASS" connector, Fig. 20) to the indication plate
- Carefully put the cover on the top duct of the section. **To prevent the cables from the damage, ensure that they do not get stuck between the fixing brackets and protection plates!**
- Fasten eight M4×16 screws and washers using a SW4 Allen wrench included in the installation kit through the holes in the bottom part of the top duct of the Section 20.

During the installation pay attention to the gaps between the top cover and the duct along the whole perimeter, repeat steps again, if necessary.

Remove the top cover in the reverse order.

8.9.7 Intrusion detectors duct covers



Attention!

It's not necessary to dismantle the intrusion detectors duct covers when installing the speed gate, only when proceeding with maintenance or repair operation.

The intrusion detectors ducts (top and bottom) have the sensors plates.

To dismantle the intrusion detectors duct covers unscrew the screw that's holding the duct cover using the SW2 Allen wrench (see Fig.24). Because of the screw the cover will get unattached from the duct, then dismantle the cover.

Bottom duct cover installation is performed in the reverse order.

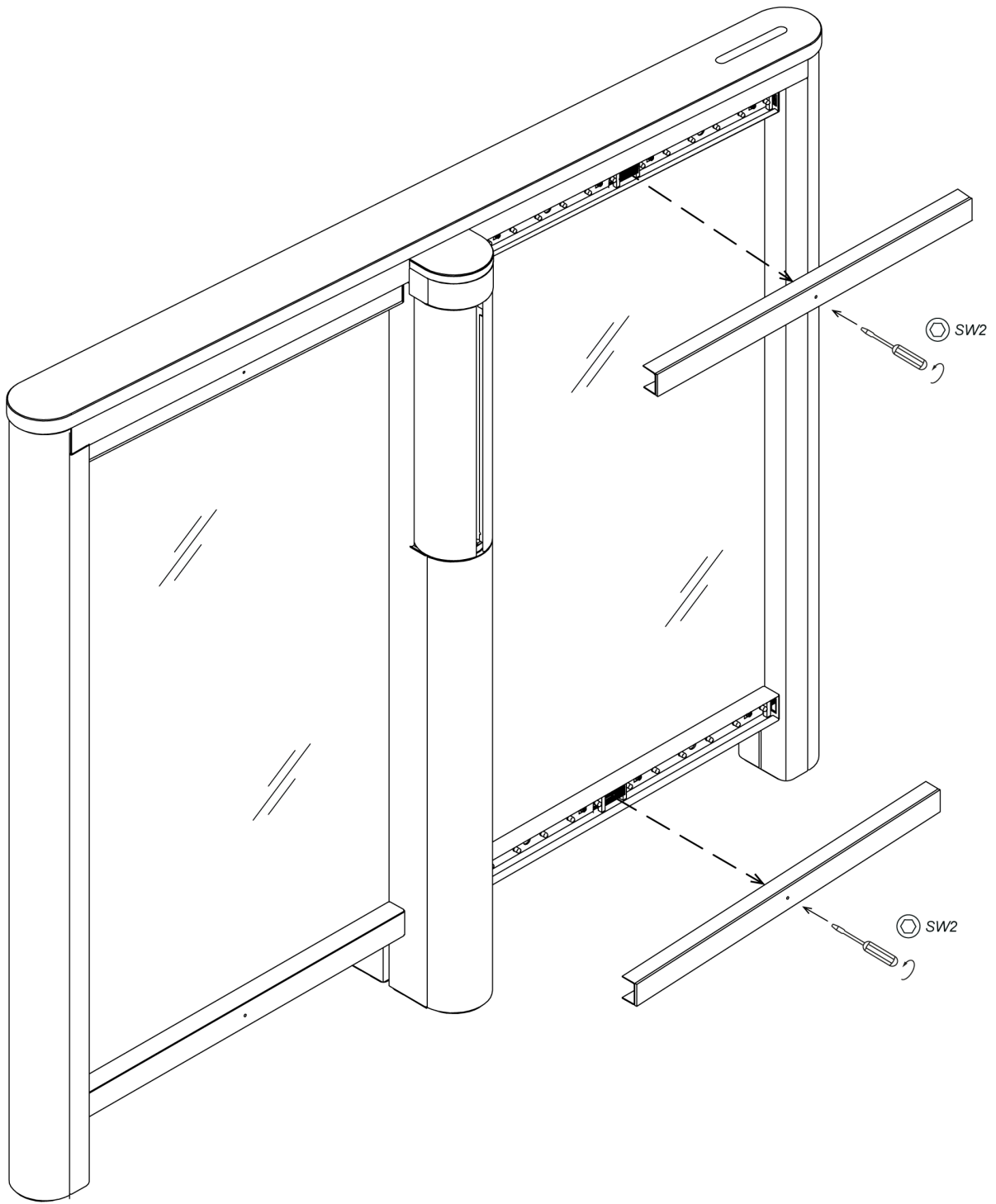


Figure. 24 Dismantling the intrusion detectors top and bottom ducts

9 OPERATION

Follow the instructions of speed gate operation in accordance with Sect. 7.2.



Attention!

- Do not move through the speed gate passage area any objects with dimensions exceeding the width of the passage lane.
- 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.
- Do not use substances that may cause mechanical damage or corrosion of the surface for speed gate cleaning.

9.1 Power-up



Attention!

Before speed gate power-up make sure that the passage lane 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 power supply unit to the AC outlet with the voltage and frequency rating complying with the certificate for the power supply unit.
2. Switch on the speed gate power supply unit. Speed gate swing panels get automatically set into an initial (locked) position.
3. At pulse control mode the “*Always locked*” command is sent automatically, at the potential control mode – “*Always locked*” command is sent automatically until another command is sent from the external controller (table 7 and 8). The speed gate is ready for operation.

9.2 Pulse control mode

Speed gate control command sending from the RC-panel and its indication on the speed gate sections is performed in accordance with table. 7. Passage directions are independent of each other, i.e. sending a command for one direction does not change the opposite passage direction mode.

Table. 7 Pulse control mode

Command	RC-panel operator actions ¹	Indication		Speed gate state
		RC-PANEL	Central post	
“ <i>Always locked</i> ”	Press the STOP button	Red “ <i>Stop</i> ” indicator is on	Red for both directions	Swing panels are closed
“ <i>Single passage in a set direction</i> ”	Press the button: LEFT/ RIGHT	Red “ <i>Stop</i> ” indicator is on and the green indicator for the set direction “ <i>Left</i> ”/ “ <i>Right</i> ” is on	Green for the chosen direction	The swing panels turn in the passage direction
“ <i>Free passage in a set direction</i> ”	Press two buttons at the same time: STOP and LEFT/ RIGHT	Green indicator of the set direction “ <i>Left</i> ” / “ <i>Right</i> ” 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: LEFT, STOP and RIGHT	Both green “ <i>Left</i> ” and “ <i>Right</i> ” indicators are on	Green for both directions	Swing panels are open until receiving the next command

¹ Buttons on the WRC fob control the same functions as the RC-panel buttons.

RC-panel buttons and indicators are shown in Fig. 8. At the same time:

- After sending “*Single passage in a set direction*” command speed gate intrusion detectors control the presence of a user in the passageway. After completing the passage, the speed gate switches to the “*Always locked*” mode.
- After sending “*Single passage in a set direction*” command, if the passage was not performed or another command was not sent, speed gate swing panels get closed automatically after **Holding in unlocked state** (8 seconds by default) expiration, the speed gate switches to the “*Always locked*” mode.
- After sending “*Single passage in a set direction*” command, if the passage was not performed, the command can be resent and **Holding in unlocked state** countdown starts again.
- After sending “*Single passage in a set direction*” command, the “*Free passage*” command for the other direction will be ignored.
- After sending “*Free passage in a set direction*” command, only “*Always locked*” or “*Single passage in a set direction*” command for the opposite direction can be sent, all other commands will be ignored.

9.3 Potential control mode

Speed gate control command sending and its indication are performed 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 <i>Unlock A</i> and <i>Unlock B</i> contacts (or low level on <i>Stop</i> contact)	Red “ <i>Stop</i> ” indicator is on	Red for both directions	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</i> ” / “ <i>Right</i> ” direction is on	Green for the chosen direction	Swing panels turn in the passage direction
“ <i>Both directions open</i> ”	Low level on <i>Unlock A</i> and <i>Unlock B</i> contacts. High level on <i>Stop</i> contact	Both green “ <i>Left</i> ” and “ <i>Right</i> ” indicators are on	Green for both directions	Swing panels are open until receiving the new command

9.4 In case of an emergency

9.4.1 “Emergency” mode

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

If there is an obstacle, interfering with the swing gate rotation in the set direction, three turns in the same direction with a 3 seconds interval are performed. If the obstacle is not removed, the speed gate switches to the “*Emergency*” mode. In “*Emergency*” mode speed gate swing panels can turn freely at a $\pm 90^\circ$ angle, which allows removing the obstacle from the passage lane with ease. In this case all three light indicators of the RC-panel are on and sound indication of 3 short sound signals, with a period of 20 seconds each is on.

“*Emergency*” mode is switched off automatically after the obstacle is removed, the speed gate passage lane is freed and the swing panels are set into an initial (closed) position.

The “*Alarm*” signal is automatically generated if the passage lane of the speed gate is occupied by something or someone for more than 30 seconds. The signal will be deactivated after the passage lane is cleared.

9.4.2 "Fire Alarm" mode

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

It is possible to place the speed gate into the "Fire Alarm" mode from the emergency opening device (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; simultaneously, for both directions, green indicators of the pass enable in the flashing mode are switched on in the indication block. Other commands at this mode are ignored.

Also, as a power loss, the swing panels can be opened manually (they are not blocked).



Attention!

The emergency exits are used for emergency evacuations in case of fire, natural disasters and other emergency conditions according to the security requirements. **BH02** railing "Antipanic" rotating section can serve as such an emergency exit.

9.5 Potential failures

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

Table. 9 Troubleshooting and remedy

Fault	Most probable cause	Remedy
Power supplies are on, but the speed gate does not function, the RC-panel lights and the LED indicators are off.	Faulty connection or breakdown in the speed gate power supply cable.	Disconnect the speed gate power supply from the mains, open the central post cover plate. Check the integrity of the power cable, check the reliability of the power cords in the XT3 terminal block of the control board.
One of the indication blocks does not work, while the speed gate operation corresponds to the algorithm 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 connection in the connectors

If the failure couldn't be fixed, contact the closest PERCo Customer Services. The list of the Customer Services can be found in the certificate of the product.

10 MAINTENANCE

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

Use liquid nonabrasive cleaners, containing aqua ammonia to remove the contamination of the speed gate sections and swing panels.

11 TRANSPORTATION AND STORAGE

Speed gate storage is allowed in dry indoor facilities at an ambient air temperature from -40°C to +50°C at relative air humidity 80% at +15°C. The storage premise should be free from acid fumes, alkali and gases that provoke corrosion.

Speed gate in the original package should be transported in closed freight containers or others closed type cargo transport units.

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, prior to installation the speed gate must be kept in the original package for no less than 24 hours indoors at room temperatures.

ANNEXES

Appendix 1. Operation algorithm at pulse control mode

“Always locked” (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 locked at this command.

“Single passage in A direction” (open for passage of one person in A direction) – active front at *“Unlock A”* contact, while there is a high level at *“Stop”* and *“Unlock B”* contact. At this command the passage direction A opens either for 5 sec. or until the passage has been made in this direction or until the command *“Always locked”*, and the status of the passage direction B does not change at that. The command is ignored if at the moment of its receipt the status of the passage direction A is *“Always free”*.

“Single passage in B direction” (open for passage of one person in B direction) – active front at the contact *“Unlock B”* while there is a high level at the contacts *“Stop”* and *“Unlock A”*. At this command the passage direction B opens either for 5 sec. or until the passage has been effected in this direction or until the command *“Always locked”*, and the status of the passage direction A does not change. The command is ignored if at the moment of its receipt the status of passage direction B is *“Free passage”*.

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

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

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

Appendix 2. Operation algorithm at potential control mode

“Both directions are locked” (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 locked at this command.

“A direction is open” (open for passage in 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 direction A opens till the low-level signal removed from the contact A or until the *“Both directions locked”* command is received.

The status of the direction B does not change at that. *“B direction is open”* (open for passage in 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 direction B opens till the low-level signal removed from the contact B or until the *“Both directions locked”* command is received. The status of the direction A does not change at that.

“Both directions are open” (open for entry and exit 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 till the low-level signal removed from one of the contacts A (B) or until the *“Both directions locked”* command is received.

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