



Speed Gate
ST-02
and Double-Sided Section
STD-02

ASSEMBLY & OPERATION MANUAL



CE EAC



***ST-02* Speed gate
and *STD-02*
Double-sided section**

Assembly and Operation Manual

CONTENTS

1	Application	3
2	Operating conditions	3
3	Technical specifications	4
4	Delivery set	6
4.1	Standard delivery set	6
4.1.1	ST-02 Speed gate	6
4.1.2	STD-02 Double-sided section	6
4.2	Optional equipment	7
5	Operation and description	7
5.1	Main features	7
5.2	Device	8
5.2.1	Section	9
5.2.2	Indication blocks	10
5.2.3	RC-panel	11
5.2.4	Control board	11
5.2.5	Remote terminal block (DIN rail)	12
5.2.6	Control signals parameters	14
5.2.7	Control modes	15
5.2.8	Speed gate operation algorithm	15
5.2.9	"Automatic opening in the selected direction" mode	17
5.3	Operating devices	17
5.3.1	RC-panel connection	18
5.3.2	Fire Alarm device	18
5.3.3	Operation from the ACS	19
5.4	Optional devices connected to the speed gate	19
5.4.1	PASS Outputs	19
5.4.2	Siren	20
5.4.3	Remote indication blocks	20
6	Marking and packaging	20
7	Safety requirements	21
7.1	Installation safety requirements	21
7.2	Operation safety requirements	22
8	Installation	22
8.1	Installation details	22
8.2	Tools and equipment required for installation	22
8.3	Cable length	23
8.4	Installation procedure	23
8.5	Mounting surface layout	27
8.6	Speed gate wiring diagram	29
8.7	Installation and dismantling of the speed gate parts and elements	32
8.7.1	Dismantling and installation of the front end panel	32
8.7.2	Removing the section from the housing	33
8.7.3	Dismantling and installation of the removable part of the section housing	34
8.7.4	Installation and dismantling of the central insert	35
8.7.5	Installation and dismantling of the filling glass	36
8.7.6	Installation and dismantling of the sliding panel	37
8.7.7	Installation and dismantling of side panels	38
8.7.8	Installation and dismantling of glass covers	39
8.7.9	The reduction of the passageway width of STD-02.900 section	40
9	Operation	42
9.1	Switching on the speed gate	42
9.2	Pulse control mode	42
9.3	Potential control mode	43
9.4	Actions in case of emergency	44
9.4.1	"Alarm" mode	44
9.4.2	"Fire Alarm" mode	44
10	Maintenance	45
11	Transportation and storage	45
	Appendix 1. Operation algorithm in pulse control mode	46
	Appendix 2. Operation algorithm in potential control mode	46

Dear customers!

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-02 speed gate and STD-02 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:

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 notice, the product design not aggravating its technical specifications.

1 APPLICATION

ST-02 Speed gate (hereinafter – *the speed gate*) is a blocking device with sliding panels and is designed for pedestrian passage control at entrance points of administrative buildings, banks, shops, railway terminals, airports, etc. The speed gate produced in two versions: **ST-02.600** with passage width of 600 mm and **ST-02.900** with passage width of 900 mm.

The speed gate consists of two sections **ST-02.600/M (ST-02.900/M)** (hereinafter – *Master section*) and **ST-02.600/S (ST-02.900/S)** (hereinafter – *Slave section*). The speed gate standard delivery set allows organizing one passage lane.

In order to increase the number of passage lanes, it is necessary to purchase **STD-02 double-sided sections** (hereinafter – *double-sided section*). Each double-sided section allows you to organize one extra passage lane. The double-sided section has two main versions: **STD-02.600** for the organization of passageways with a width of 600 mm and **STD-02.900** for the organization of passageways with a width of 900 mm.

In order to organize a checkpoint with passage lanes of different widths (600 and 900 mm) it is necessary to use **ST-02.600/900** version (includes *Master* and *Slave* sections with panels of different widths that can be supplied on a separate order), and **STD-02.900** double-sided section can be configured so to reduce the extended panel width for the 600 mm-wide passageway.

**Note:**

It is possible to install access card reader inside of the speed gate sections that are produced by **PERCo (IR03.1, MR07 OEM, RP-15.2)** and third-party manufacturers. Access card readers are not included in the standard delivery set! Selection of the reader and its installation into equipment is performed by the customer (installer) in accordance with the checkpoint project and ACS and controller characteristics. Readers must meet the following requirements:

overall dimensions..... max. 230×72×32 mm
passage sensor reading range min. 40 mm

Also, it is possible to install the ACS controller inside the speed gate section. Dimensions are limited to max. 160×140×40 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 ambient air temperature from +1°C to +50°C and relative air humidity of 80% at +25°C.

3 TECHNICAL SPECIFICATIONS

Operating voltage	24 VDC
Allowable voltage ¹	20-28 VDC
Maximum current consumption	max. 8.5 A ²
Power consumption ³	max. 204 W
Throughput rate in single passage mode	up to 60 persons / min
Passageway width:	
ST-02.600	600 mm
ST-02.900	900 mm
Number of installed passage sensors:	
upper level	30
lower level	30
RC-panel cable length ⁴	min 6.6 m
IP-Code	IP41 (EN 60529)
Electric shock protection class	III (IEC 61140)
Mean time to failure	min. 2,000,000 passages
Mean lifetime	min 8 years
Overall dimensions of the speed gate (length × width × height) ⁵ :	
ST-02.600	1923×1364×1482 mm
ST-02.900	1923×1964×1482 mm



Note:

Use the following formula to calculate the total width of the speed gate when several passage lanes are arranged (see Fig. 2):

$$L_{\text{total}} = 600N + 382n + 900M + 532m \text{ (mm)}, \text{ where:}$$

N – number of passage lanes with a width of 600 mm,
n – number of **ST-02.600/ M(S)** and **STD-02.600** sections,
M – number of passage lanes with a width of 900 mm,
m – number of **ST-02.900/M (S)** and **STD-02.900** sections.

Weight (net):

ST-02.600/ M (ST-02.600/S) section	max 198 kg
ST-02.900/ M (ST-02.900/S) section	max 224 kg
STD-02.600 double-sided section	max 228 kg
STD-02.900 double-sided section	max 230 kg
sliding panel for ST-02.600, STD-02.600	max 9 kg
sliding panel for ST-02.900, STD-02.900	max 13 kg
filling glass for ST-02.600, STD-02.600	max 5 kg
filling glass for ST-02.900, STD-02.900	max 7 kg

¹ In case of use of backup power sources such as batteries, etc.

² As a power source for the turnstile, the manufacturer recommends using power supplies with an output voltage of 24VDC and a maximum load current of at least 10 A.

³ Consumption current and power consumption are specified for each **ST-02** or **STD-02** product separately.

⁴ The maximum length of the RC-panel cable is 40 m (supplied upon request).

⁵ The overall dimensions of the turnstile with one or more passage lanes are shown in Fig. 1, 2.

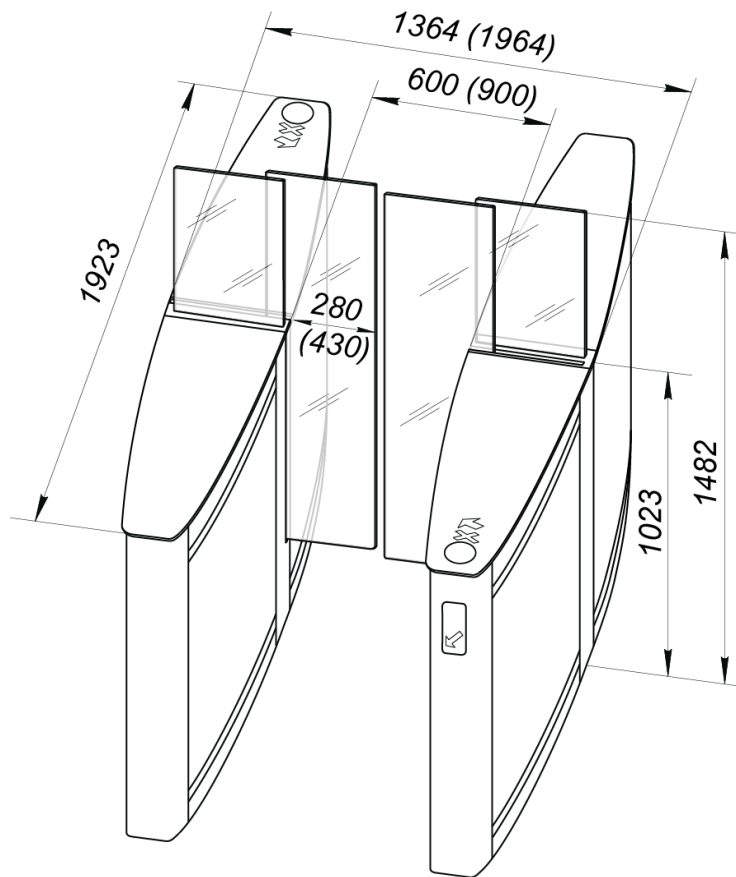


Figure 1. Overall speed gate dimensions

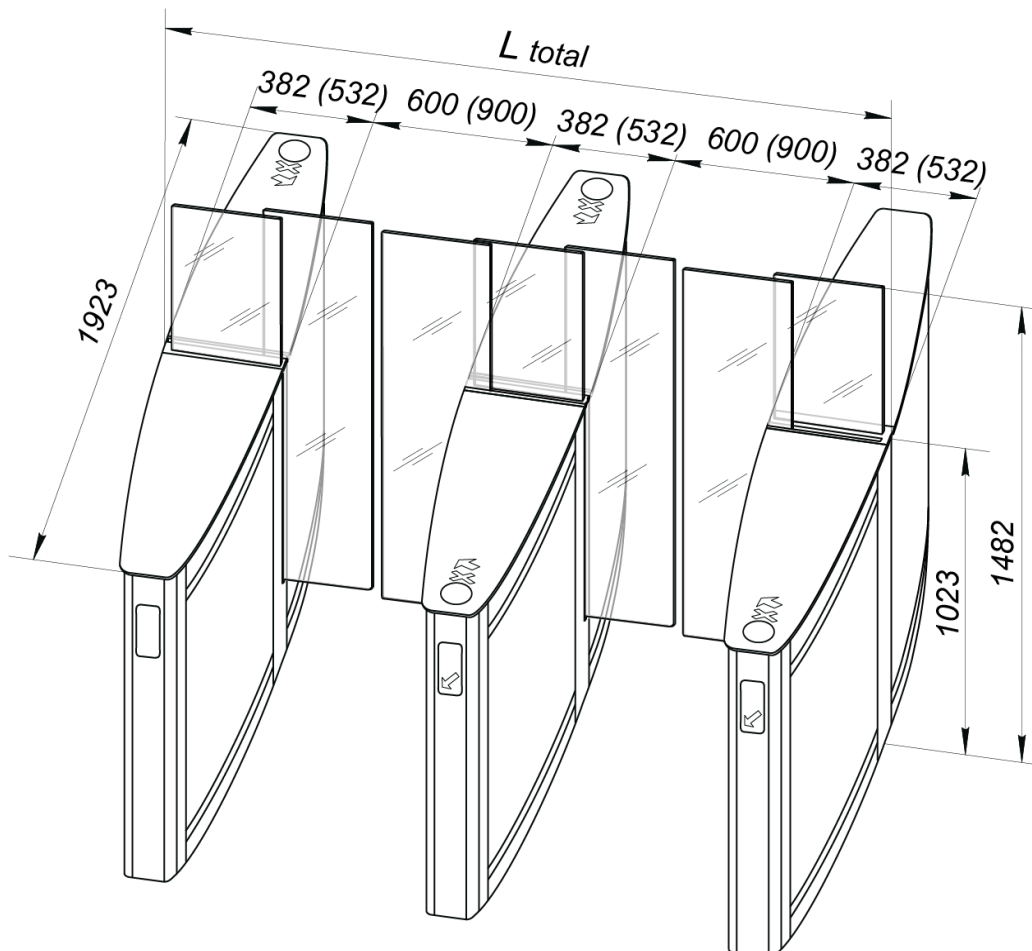


Figure 2. Overall dimensions of several passage lanes

4 DELIVERY SET

4.1 Standard delivery set

4.1.1 ST-02 Speed gate

Main equipment:

Master ¹ section	1
Slave ¹ section	1
glass cover.	4
filling glass	2
sliding panel	2
side panel	4
central insert	2
RC-panel with cable	1
intersectional cables kit (DC and CAN cables)	1
jumper	3
VSS-5 board retainer	4
adjusting plate 1 mm	4
adjusting plate 1.5 mm	8
self-adhesive rubber pad with pictogram	2

Operational documentation:

Certificate	1
Assembly and Operation manual	1

Packaging:

boxes No.1 and No.2 for the Master section	2
boxes No.3 and No.4 for the Slave section	2

4.1.2 STD-02 Double-sided section

Main equipment:

double-sided section ¹	1
glass cover	2
side panel	2
filling glass	1
sliding panel	2
central insert	1
RC-panel with cable	1
intersectional cables kit (DC and CAN cables)	1
jumper	3
FSS-5 board retainer	4
adjusting plate 1 mm	2
adjusting plate 1.5 mm	4
self-adhesive rubber pad with mnemonic image	2
accessories for installation of the sliding panel departure limiter ² :	
reflector	1
support	2
screw M4×8	6
template	1

Operational documentation:

Certificate	1
-------------------	---

Package:

boxes No.1 and No.2	2
---------------------------	---

¹ All sections are supplied with dismantled parts: swing panels, side panels, filling glasses, glass covers and central inserts.

² Only for **STD-02.900**. It shortens the sliding panel sweep up to 280 mm, used for the passageway of a width of 600 mm.

4.2 Optional equipment

In addition to the standard delivery set, the following additional equipment can be supplied on a separate order:

IR03.1 (HID/EMM), or MR07 OEM (Mifare), or RP-15.2 (HID/EMM, Wiegand)	
access card readers	2 per passage lane
Mounting kit for the mounting surface for each speed gate section:	
PFG IH10 anchor (SORMAT, Finland) with bolt and washer	6
WRC device ¹	1

5 OPERATION AND DESCRIPTION

5.1 Main features

- The speed gate can operate in two main modes:
 - **normally closed mode** – speed gate sliding panels are in closed position, when the power is turned off, the sliding panels remain in the closed position and, if necessary, can be moved apart manually (not locked);
 - **normally open mode** – speed gate sliding panels are in the open position, when the power is turned off, the sliding panels remain in the open position and do not lock the passage.
- For normally-closed mode, it is possible to set an additional **Automatic opening in the selected direction** operating mode in the pre-selected direction: the sliding panels automatically open for each passage through the speed gate and close after the passage. The mode can be set only for one direction; the second direction remains in the main operating mode.
- In all operating modes the speed gate sends an alarm signal if the passageway is locked for more than 30 seconds.
- Two levels of the passage sensors are installed along the entire length of the speed gate passageway. This allows you to track the position of the user within the passageway, and also allows multiple users to be in the passageway at the same time who are passing in the same direction.
- If necessary, the number of passage lanes through the speed gate can be increased by installing **STD-02** double-sided sections.
- It is possible to organize a checkpoint with passage lanes of different widths: 600 and 900 mm. For this purpose, the following products should be used: **ST-02.600/900** (supplied upon request) and **STD-02.900** with the sliding panel departure limiter installed on one side.
- When organizing several passage lanes, the front end indication blocks allow the user to choose the right passage in the right direction.
- The speed gate supports two control modes: pulse and potential.
- Speed gate can operate both as an operating device within the ACS, and as a standalone unit controlled by operator from the RC-panel.
- It is possible to install an external ACS controller and proximity readers inside the speed gate section under the glass top cover.
- The speed gate glass top cover features a built-in indication block, which combines a passage grant/denial indicator and card interrogation zone indicator.
- It is possible to connect remote indication blocks to duplicate the passage grant / denial indication.
- It is possible to connect a siren to the speed gate in order to warn the operator about unauthorized passage attempts.
- There is a possibility of automatic emergency opening of the passageway when a *Fire Alarm* command is sent. The *Fire Alarm* command can be sent by the safety fire alarm device or by

¹ The WRC kit consists of a receiver, connected to the control board and a transmitter in the form of a fob.

the operator by means of the emergency button (hereinafter – the emergency passage opening device).

- Speed gate parts are made of polished stainless steel. The sliding panels and the filling glass are made of tempered glass with a thickness of 8 mm.

5.2 Device

The speed gate design is shown in Fig. 3, the double-sided section is shown in Fig. 4 . The numbers of the parts in the text are shown in accordance with Fig. 3 and 4.

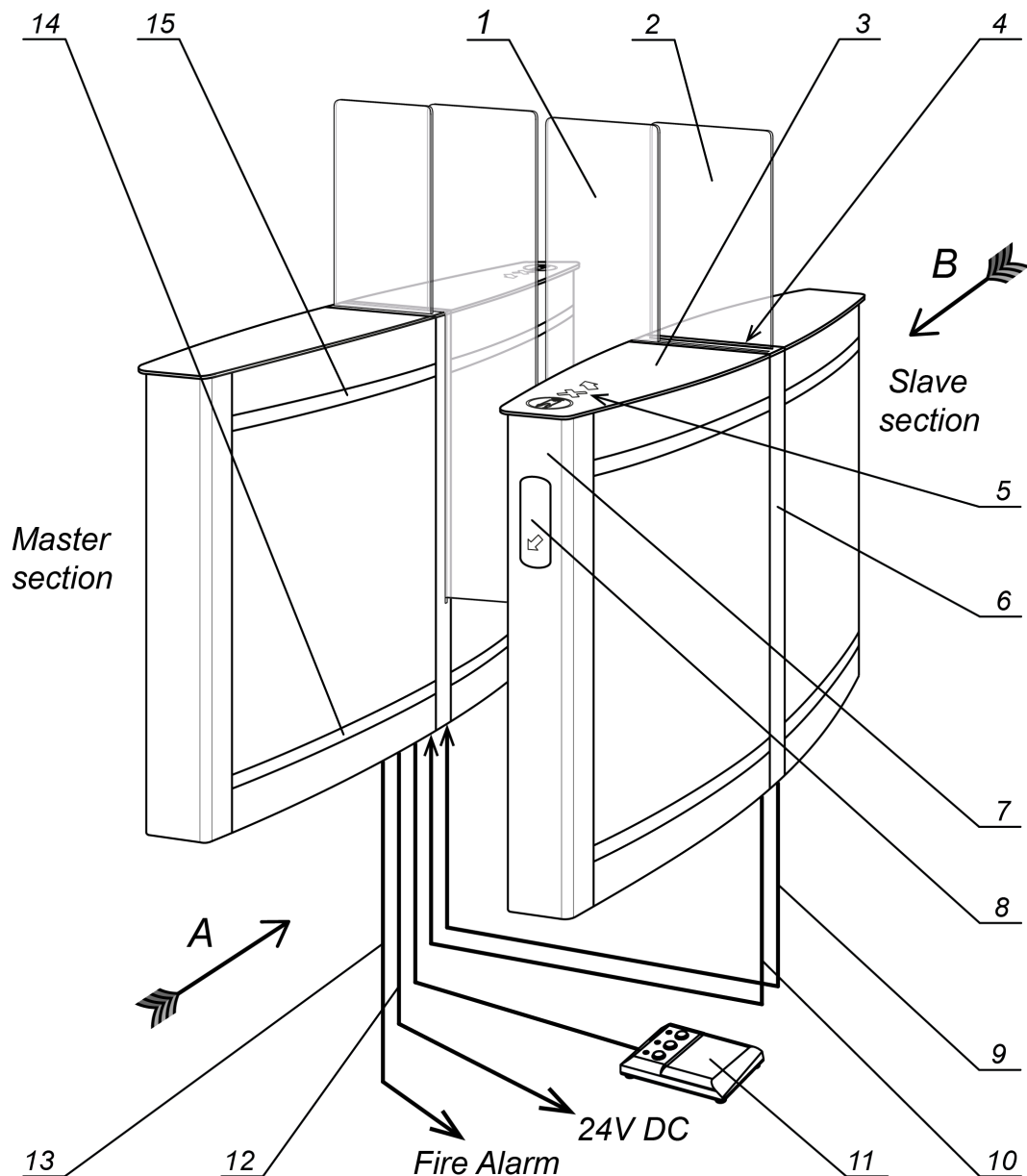


Figure 3. ST-02 overall view

- 1 – sliding panel; 2 – filling glass; 3 – glass cover; 4 – central insert; 5 – upper indication block;
 6 – side panel; 7 – front panel; 8 – front end indication block; 9 – DC connection cable;
 10 – CAN connection cable; 11 – RC-panel with cable; 12 – power supply cable¹;
 13 – *Fire Alarm*¹ device cable; 14 – lower level of passage sensors;
 15 – upper level of passage sensors

¹ Not included in the standard delivery set.

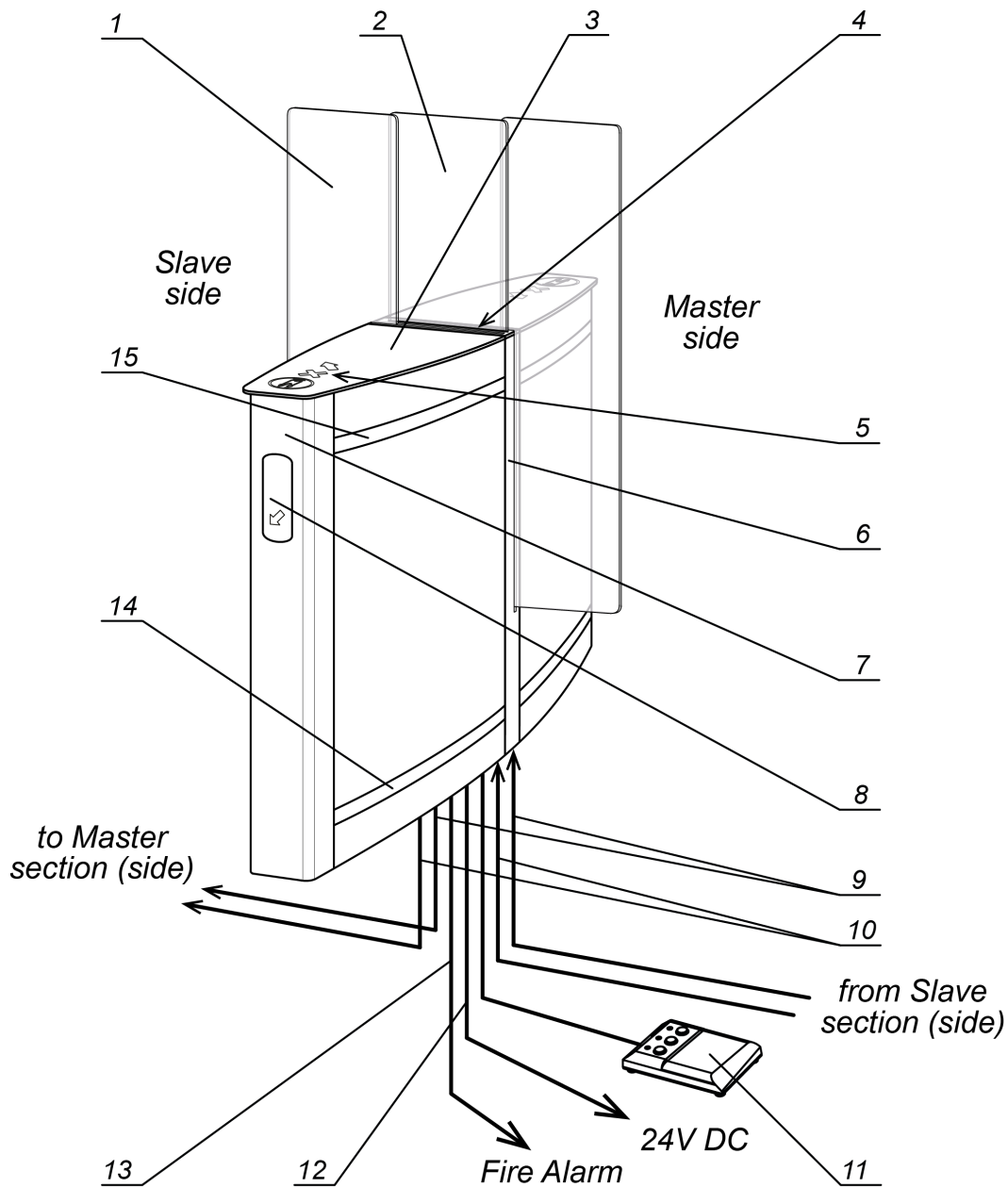


Figure 4. STD-02 overall view

- 1 – sliding panel; 2 – filling glass; 3 – glass cover; 4 – central insert;
 5 – upper indication block; 6 – side panel; 7 – front panel; 8 – front end indication block;
 9 – DC connection cable¹; 10 – CAN¹ connection cable; 11 – RC-panel with cable;
 12 – power supply cable²; 13 – *Fire Alarm*² device cable;
 14 – lower level of passage sensors; 15 – upper level of passage sensors

The speed gate consists of two sections, *Master* and *Slave*, as well as the RC-panel (11). The *Slave* section is connected to the *Master* section via two DC and CAN connection cables (9, 10).

Each section has a sliding panel (1) and a fixed filling glass (2).

In order to increase the number of passage lanes, it is necessary to install double-sided sections. Each double-sided section is also equipped with the RC-panel (11). It has two sliding panels (1): on the *Master* side and *Slave* side. Each sliding panel is driven by its electric drive. The *Slave* section of the speed gate (the *Slave* side of the next double-sided section) is connected to the *Master* side with two connection cables (9, 10) from the speed gate delivery set (double-sided section) (see Fig. 4).

¹ One pair of DC and CAN cables are supplied with the nearby product.

² Not included in the standard delivery set.

5.2.1 Section

Each section is a single piece of equipment. There are two glass covers (3) that cover the top of the section. There is a central insert with grooves for the sliding panel (sliding panels) and for the filling glass located between the glass covers on top of the section. The fixing points of the sliding panels (1) and filling glass (2) to sections are covered by side panels (6) from two sides. **ST-02** has side panels of two types-one is solid and one with a groove for the sliding panel, both side panels of the **STD-02** double-sided section have grooves for the sliding panels.

The upper indication block (5) is built into one of the glass top covers at the front end of the section (double-sided section features two upper indication blocks in both top covers), which includes an indicator of the passage granting (green arrow), an indicator of the passage denial (red cross) and an indicator of the card interrogation zone ("hand with a card" pictogram).

The section front ends are covered with front end panels made of stainless steel (7). There is a front end indication block (8) located on one of the front end panels (7) that indicates the passage direction or the passage denial (white arrow or red cross). Both front end panels of the double-sided section are equipped with indication blocks.

The sliding panel (1) is driven by a mechanism that is equipped with an electric drive and located inside the section.

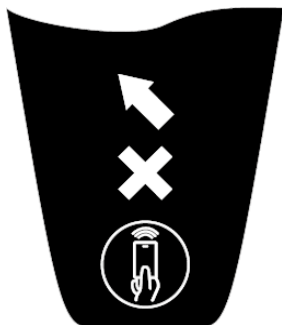
There are two levels of passage sensors on the sides of the section – the lower one (14) and upper one (15) – are located under the plastic inserts and provide the passage control.

The **ST02.-30.771** control board (hereinafter – *control board*) is installed under one of the glass covers of the *Master* section (section side), see Fig. 20. Power supplies, RC-panel (WRC-receiver), *Fire Alarm* device and, if necessary, other optional equipment, as well as connection cables from the *Slave* section (section side) are connected to the control board through the remote terminal block (Fig. 7).

5.2.2 Indication blocks

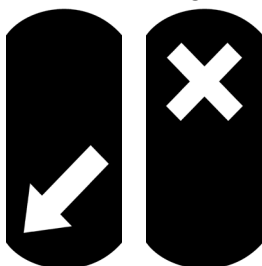
The following indication blocks are installed on each speed gate section:

- Upper indication block (5) is installed on one of the glass top covers (**STD-02** – on both section top covers). It includes a white indicator (hand with a card) that indicates card interrogation zone, a green indicator (arrow) that lights up when the passage is allowed in this direction, and a red indicator (cross) that lights up when the passage is denied:



- authorized passage green indicator
- passage denial red light
- card interrogation zone white indicator

- The front end indication block (8) on the front end panels is designed to indicate the passage direction through the speed gate. It constantly displays – either a white arrow or a red cross:



- passage denial red light
- passage direction white indicator

The type of front end indication is selected during the speed gate installation by switching the connection cable of the front end indication block to the corresponding connector of the indication control module (located under the speed gate top cover inside the housing, Fig. 19). By default, the connection cable is connected to the **ARROW** connector, which corresponds to the white arrow. It is necessary to remove the glass cover (3) in order to access the indication control module (see Fig. 26).

5.2.3 RC-panel

The RC-panel (11) is a small desktop device packed in a housing made of impact-resistant ABS plastic. The RC-panel is designed to send commands by an operator when controlling the speed gate manually. Overall view of the RC-panel is shown in Fig. 5.

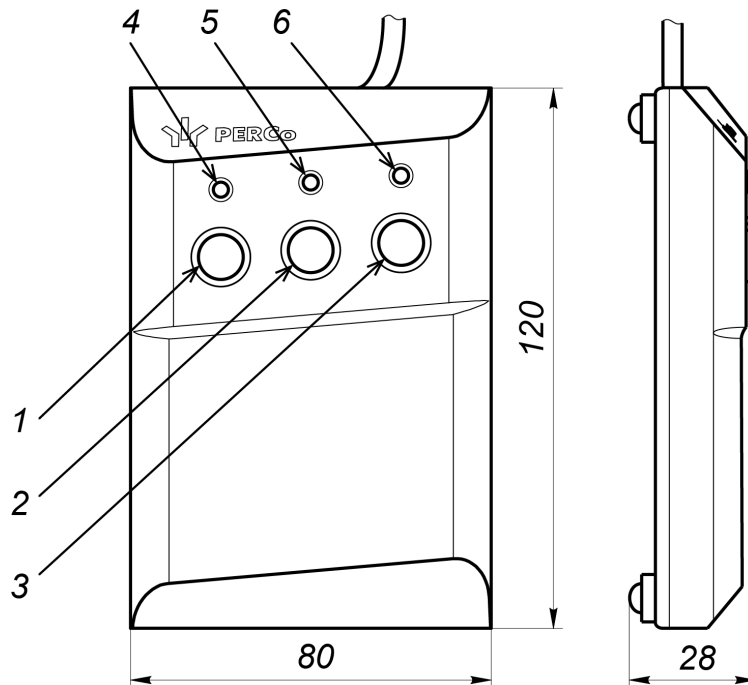


Figure 5. Overall view and overall dimensions of the RC-panel

1, 2, 3 – **LEFT, STOP, RIGHT** buttons are used for control commands;
4, 6 – "Left", "Right" green LED indicators; 5 – "Stop" red LED indicator

There are three buttons for sending commands on the RC-panel front panel. The middle **STOP** button is used to send the "Passage denial" command. Left and right buttons **LEFT, RIGHT** are used to send the command to open the passage in the selected direction. LED indicators of the passage direction status are located above the buttons. The red "**STOP**" indicator signifies that both directions of the passage are closed. The list of control commands and RC-panel indication for pulse and potential control modes are shown in Table 5 and Table 6.

5.2.4 Control board

The speed gate control board (Fig. 6) is located in one of the openings of the housing under the glass top cover of the *Master* section (see Fig. 20), the Board is covered by a metal cover with four screws with the aim of protecting from external actions. All input and output signals of the control board, with the exception of relay outputs that control additional remote indicators (**X4** connector), are brought out to the contacts of the remote terminal block with DIN-rail (Fig. 7, sect.5.2.5).

The control board is equipped with a microcontroller that processes incoming (*Unlock A, Stop, Unlock B* and *Fire Alarm*) control commands, monitors the optical sensors status and, based on the received data, generates commands for the sliding panels motor drive.

Also, the microcontroller generates signals on the outputs of the control board: for RC-panel indication (outputs *Led A, Led Stop* and *Led B*), for remote indication (outputs *Light A, Light B*), the registration of the passage in the corresponding direction (*PASS A* and *PASS B*), the alarm (*Alarm*). Elements of the control board:

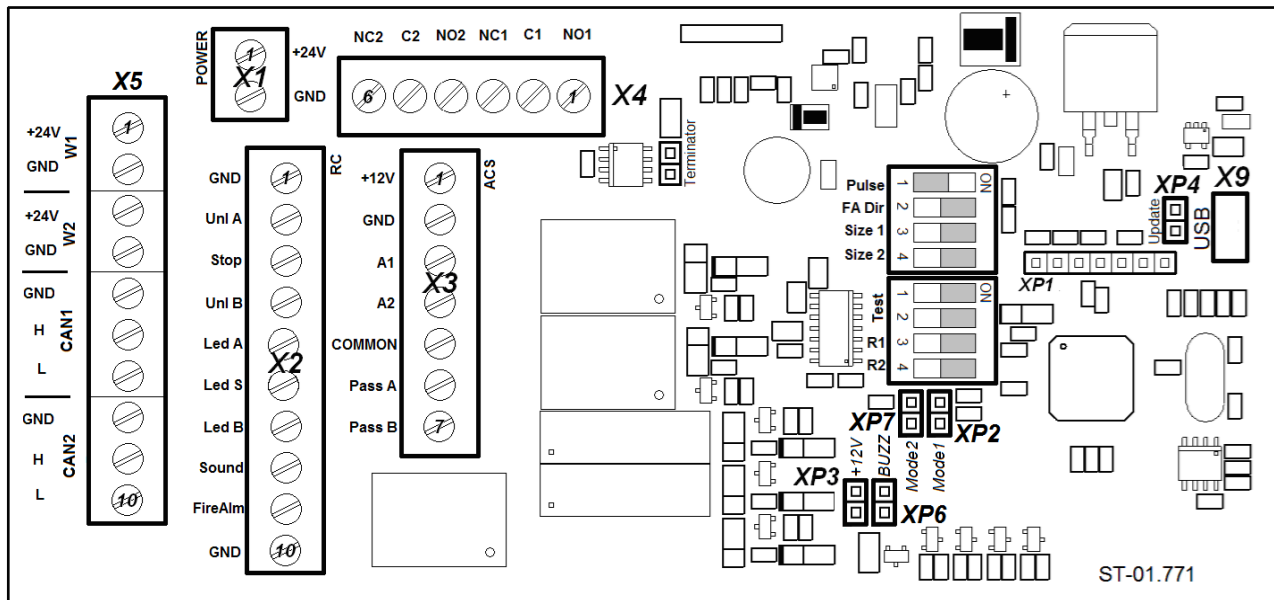


Figure 6. Control board overview

Connectors for jumpers:

- **XP1 (Program)** – service connector.
- **XP2 (Mode1)** – connector for switching the speed gate in normally open mode (see section 5.2.8). By default, the jumper is not installed, which corresponds to the normally closed mode.
- **XP3 (+12V)** – connector for the activation of LED indication on the control board. By default, the jumper is installed, which corresponds to the activated indication.
- **XP4 (Update)** – connector for switching the control board to firmware update mode via USB-interface. By default, the jumper is removed.
- **XP6 (BUZZ)** – connector on the control board for buzzer activation. The buzzer duplicates the sound indication of the RC-panel and the siren. By default, the jumper is installed, which corresponds to the activated buzzer.
- **XP7 (Mode2)** – is not used. The jumper must be removed during operation.

Switches:

- **Pulse** – switches the speed gate to pulse control mode. By default, the switch is in the **ON** position, which corresponds to the pulse control mode of the speed gate.
- **Size1, Size2**-by default, both switches are set to the position corresponding to this type of speed gate, it is forbidden to change their position during operation!
- **Test 1** - is not used. Must be in **OFF** position during operation.
- **Test 2**-is used to turn on the LED indication on the PCS boards. By default, the switch is in the **OFF** position, which corresponds to the deactivated indication.
- **R1**-is used to enable the "Automatic opening in the selected direction" operating mode (see sect. 5.2.9). By default, the switch is in the **OFF** position.
- **R2**-is used to select the direction of the authorized passage in the "Automatic opening in the selected direction" mode (switch **R1** in the **ON** position). By default, the switch is in the **OFF** position, which corresponds to direction A.

5.2.5 Remote terminal block (DIN rail)

Input and output signals from the control board of the *Master* section are brought out to the contacts of the remote terminal block (DIN-rail) (Fig. 7), which greatly simplifies the connection of the speed gate.

The remote terminal block is located at the bottom, under the side panel of the *Master* section (section side) on the inner side of the passageway. The appearance of the remote terminal block, as well as the contacts numbering order, are shown in Fig. 7. The contact assignment of the remote terminal block is shown in the Table 1.

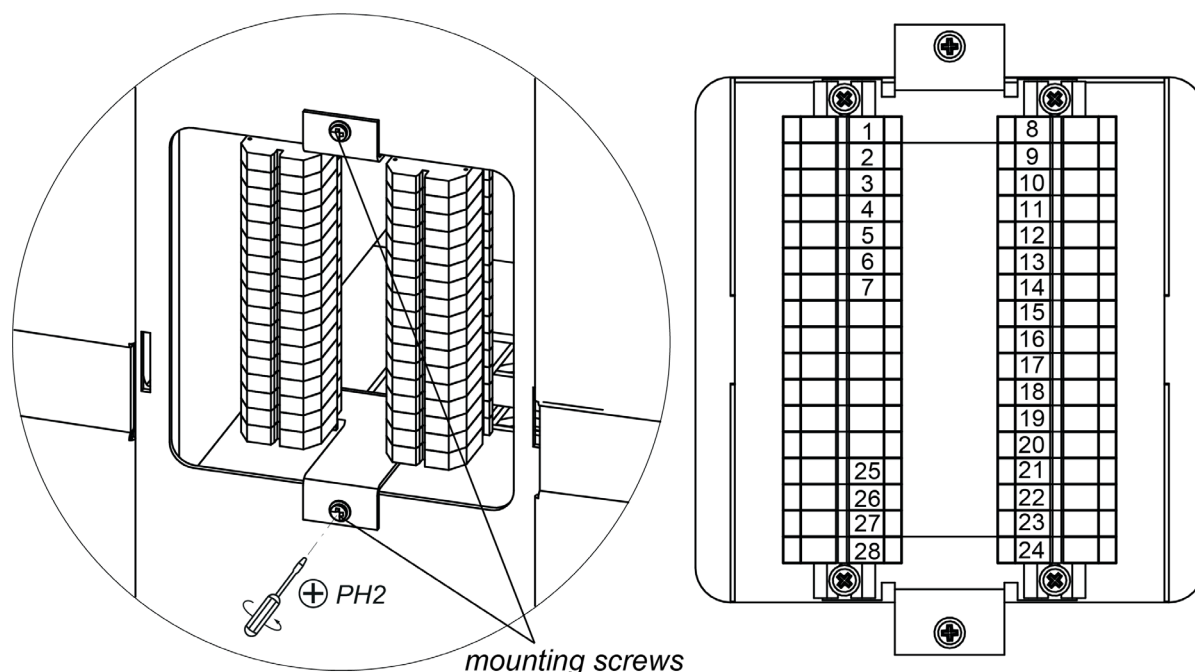


Figure 7. Overview of the remote terminal block

Table 1. Contact assignments of the remote terminal block

No	Contact	Master section	Slave section
1	+24V	External power supply connection	Not used
2	GND		
3	+24V	Power supply of the Slave section (DC cable connection)	Power supply of the Master section (DC cable connection)
4	GND		
5	GND	CAN cable connection	CAN cable connection
6	H		
7	L		
8	GND	Common (RC-panel connection)	Not installed
9	Unlock A	Control input of A direction	
10	Stop	Control input – passage denial	
11	Unlock B	Control input of B direction	
12	Led A	Indication output of direction A on the RC-panel	
13	Led Stop	Output of passage denial indication on the RC-panel	
14	Led B	Indication output of direction B on the RC-panel	
15	Sound	RC-panel audio output	
16	Fire Alarm	Emergency passage opening control input	
17	GND		
18	+12V	+12V output for additional devices	
19	GND	Common	
20	Alarm1	Output for the siren connection	
21	Alarm2		
22	Common	Common for PASS A, PASS B outputs	
23	PASS A	PASS A output (passage in A direction)	
24	PASS B	PASS B output (passage in B direction)	
25	RF	Spare contact for built-in reader connection	Spare contact for built-in reader connection
26			
27			
28			

The *Slave* section uses a similar remote terminal block to connect the power and motor drive control cables DC (9) and CAN (10), as well as, if necessary, the connection cable for the built-in reader.

Also, there are unused and unnumbered contacts on the DIN-rail, in addition to those listed in the table, that can be used to connect other additional devices to the speed gate.

5.2.6 Control signals parameters

Passage control through the speed gate is carried out by sending control signals to the *Unlock A*, *Stop* and *Unlock B* inputs. The control signal is a **low-level signal** at the *Unlock A*, *Stop* and *Unlock B* contacts relative to the *GND* contact. Normally open relay contact or circuit with open-collector output can serve as a control element (Fig. 8 and 9).

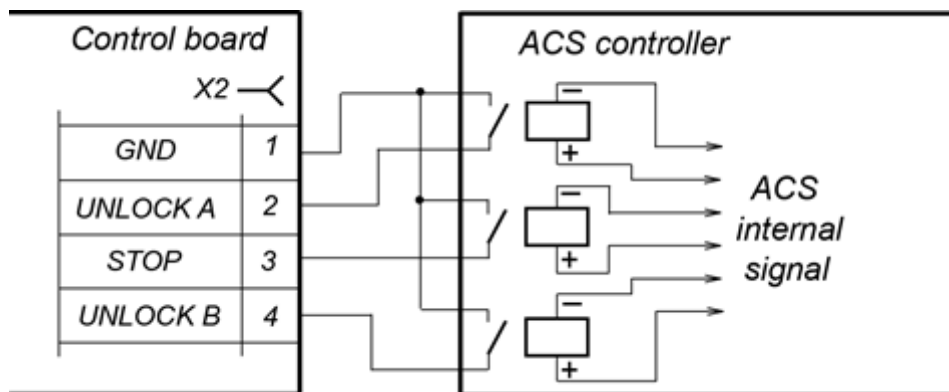


Figure 8. Control elements of the external device – normally opened relay contact

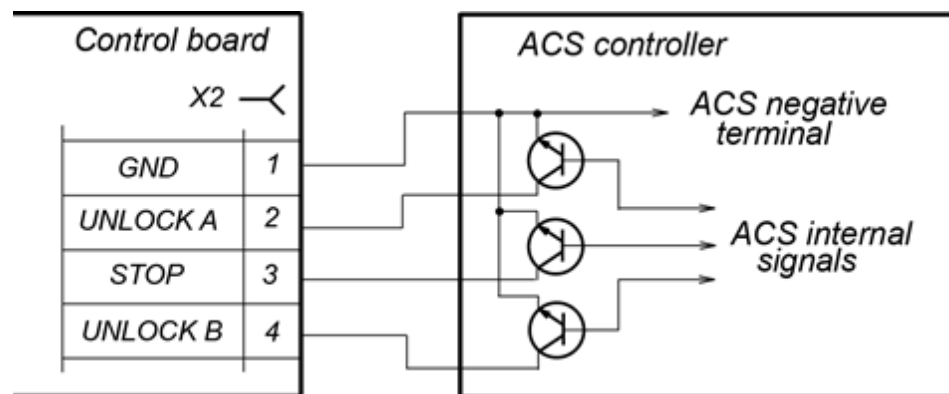


Figure 9. Control elements of the external device – a circuit with open-collector output

Emergency opening of the speed gate is carried out by sending a control signal to the *Fire Alarm* input. The control signal is a **low-level signal released** from the *Fire Alarm* contact relative to the *GND* contact. Normally closed relay contact or circuit with open-collector output can serve as a control element. All control commands sent to the other inputs of the speed gate are ignored. When a low-level signal is sent to the *Fire Alarm* input, the "*Passage denial*" command is automatically sent and the speed gate sliding panels will close (see section 5.3.2).



Note:

In order to generate a high-level signal at all input contacts (*Unlock A*, *Stop*, *Unlock B*, *Fire Alarm*) it is necessary to use *1kOhm* resistors connected to the + 3.3 V power bus.

The control element must provide the following signal characteristics:

control element-relay contact:

minimum commutated current max. 4 mA

closed contact resistance

(with the account for the resistance of the connection cable max. 200 Ohm

control element-circuit with open collector output:

voltage at closed contact (low-level

signal, at the control board input) max. 0.8 V

5.2.7 Control modes

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



Attention!

Change of the switches positions, removal, and installation of jumpers on speed gate boards should be carried out only when the speed gate is switched off.

The control mode is selected by the **Pulse** switch located on the speed gate control board (see Fig. 1). By default, the switch is in the **ON** position, which corresponds to the pulse control mode of the speed gate.

Move the switch to the **OFF** position in order to place the speed gate in 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 by using RC-panel, WRC device and ACS controller with outputs that support pulse control mode.

The description of the speed gate operation in pulse control mode is shown in Table 5.

Control signal duration when sending a control command to control inputs must be not less than 100 ms. The default time-out period is 8 seconds and does not depend on the duration of the control signal (pulse).

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



Note:

The active front of the signal corresponds to pressing the corresponding button on the RC-panel / WRC-device. The low-level signal corresponds to the pressed button, high-level - not pressed.

Potential control mode

The mode is used to control the speed gate by using the ACS controller with outputs that support potential control mode. The description of the speed gate operation in potential control mode is shown in the Table 6.

Control signal duration when sending a control command to control inputs must be not less than 100 ms. The default time-out period is equal to the duration of the control signal. I. e. - if there is a low-level signal on the input at the moment of passage in the authorized direction, then the speed gate will remain open in the selected direction.

The operation algorithm is given in Appendix 2. Both directions are closed when a low-level signal is sent to the *Stop* input, regardless of the signal levels at the *Unlock A* and *Unlock B* inputs. The directions are switched to the mode corresponding to the signal levels at the *Unlock A* and *Unlock B* inputs when the low-level signal is removed from the *Stop* input.



Note:

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

5.2.8 Speed gate operation algorithm

The speed gate supports two operating modes:

1. Normally closed mode (**XP2 (Mode1)** jumper is not installed):
 - speed gate sliding panels are in closed position; the speed gate passageway is permanently locked;

- sliding panels automatically open during authorized passage and automatically close after the passage;
 - when the power is turned off (power loss), the sliding panels remain in closed position and, if necessary, can be manually moved apart (not locked).
2. Normally open mode (**XP2 (Mode1)** jumper is installed):
- in the home position, speed gate sliding panels are in the open position, the passageway is constantly opened;
 - the sliding panels automatically close and block the passageway in case of an unauthorized passage attempts; they automatically reopen when the passageway is free;
 - when the power is turned off (power loss), the sliding panels remain in the open position and do not interfere with the free passage through the speed gate.

The speed gate operation algorithm in the pulse control mode for a single pass in one direction:

1. A command (a combination of control signals) is sent from the control device (RC-panel, WRC-device, ACS-controller) to the inputs of the control board in order to perform a single passage in one direction.
2. The microcontroller installed on the control board processes the received combination of signals and generates a command to the speed gate actuating mechanism to authorize the passage and activates passage granting indication.
3. Passage in the selected direction is authorized. The sliding panels are moved apart in the normally closed operating mode. The **Holding time in the unlocked state** countdown starts (8 seconds by default).
4. The passage is registered when the user enters the passageway. One of the *PASS A* or *PASS B* relay outputs is activated for 250 ms according to the passage direction. User location in the passageway is monitored by passage sensors.



Note:

In order to prevent contact with the sliding panels, the speed gate is equipped with the danger zone detection. When the user is in this area, the opening or closing of the sliding panels is blocked.

5. After the user walks through the opened sliding panels he/she gets into a safe zone; the microcontroller of the control board sends a command to the speed gate actuating mechanism to close the sliding panels and deactivates the passage granting indication. The sliding panels are closed in normally closed operating mode.
6. The closing of the sliding panels does not occur if a new user has been authorized **in the same passage direction** while the first user is walking through the passageway, thus the new user can immediately follow the first one.



Note:

To increase the passageway effectiveness, it is recommended to arrange separate passage lanes for each direction. Passage directions for each passage lane can be displayed on the front end indication blocks.

7. If the user does not enter the passageway during the **Holding time in the unlocked state**, the microcontroller on the control board sends a command to the speed gate actuating mechanism to close the passageway. The sliding panels are closed in normally-closed operating mode.

The speed gate operation algorithm in the pulse control mode in case of an unauthorized passage in one direction:

1. When the user enters in the passageway zone, passage sensors register an unauthorized passage.
2. The microcontroller that is installed on the control board processes the received combination of signals and switches to the alarm mode. The audible alarm will be activated to prevent unauthorized passage. In the normally open operating mode, the speed gate sliding panels will move and lock the passage.

3. The microcontroller will deactivate the alarm mode when the user leaves the passageway. The audible alarm switches off. In the normally open operating mode, the speed gate sliding panels will move apart and open the passageway.

In the **potential control mode**, the **speed gate operation algorithm** depends on the external commands of the ACS controller. For the correct speed gate operation, the passage granting control signal from the ACS controller must be removed after receiving the signal from the *PASS* output of this direction.

5.2.9 “Automatic opening in the selected direction” mode

This is an additional speed gate operating mode that was designed to organize a special passage mode, when it is necessary to provide free entry (or exit), in cases when the sliding panels should be closed in the home position, and to prevent unauthorized passage in the opposite direction at the same time (for example, at the entrance to the sales area of the store, etc.).



Attention!

“Automatic opening in the selected direction” mode is relevant only for the normally closed speed gate operating mode (see section 5.2.8).

This mode is activated by means of **R1** and **R2** switches located on the speed gate control board (see Fig. 2, sect.5.2.4).



Attention!

Change of the switches position must be carried out only when the speed gate power is switched off.

The mode allows you to organize free passage through the speed gate in one pre-selected direction, with automatic opening and closing of the sliding panels when walking through. If the passage is authorized from the opposite direction (by means of the RC-panel, WRC-device or ACS-controller), the *“Automatic opening in the selected direction”* mode switches off during this passage.

The speed gate operation algorithm in this mode:

- 1) In the initial state and unoccupied passageway in the *“Automatic opening in the selected direction”* mode direction, the green indicator of the passage granting is lit, the red indicator of the passage denial is lit from the opposite direction. Pressing of the RC-panel button or sending commands from the ACS controller for passage permission in the *“Automatic opening in the selected direction”* mode direction are ignored.
- 2) The passage sensors send signals to the speed gate controller to open sliding panels when the user is walking through in the *“Automatic opening in the selected direction”* mode. The speed gate sliding panels open for the passage in this direction, then the passage sensors send the command to the controller to close the sliding panels after the passage, the sliding panels automatically close behind the user. The indication remains in its initial state.
- 3) The speed gate operation algorithm is similar to the usual algorithm when the passage is done in the direction that is opposite to *“Automatic opening in the selected direction”* mode (sect.5.2.8). The *“Automatic opening in the selected direction”* mode switches off for the time of passage (time-out period) during the authorized passage, while the *“Free passage”* mode set for this direction – for the entire period that this mode is set to.
- 4) All other situations, including attempts to simultaneously pass in both directions, are considered abnormal, the controller will generate an alarm and a command to close the sliding panels when such situations occur.

5.3 Operating devices

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

There may be cases of overlapping control signals when several control devices are connected to the speed gate in parallel. In this case, the reaction of the speed gate will correspond to the command formed by the combination of signals (see 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 remote terminal block in accordance with the speed gate wiring diagram (see Fig. 17).



Note:

When the speed gate is operated as part of ACS, it is recommended to connect the RC-panel to the ACS-controller in accordance with the controller operational documentation.

The WRC receiver is connected to the *Unlock A*, *Stop*, *Unlock B* and *GND* contacts of the remote terminal block or, when installed inside the speed gate, directly to the control board to the corresponding contacts of the **X2** connector. The power supply of the WRC-receiver is connected to +12V contact of the remote terminal block or **X3** connector of the control board.

The standard position of the RC-panel towards the sections is shown in Fig.10. If the operator working place is located on the opposite side regarding *Master* section, then for ease of operation it is necessary to swap the wires from the RC-panel connected to the contacts *Unlock A* and *Unlock B*, as well as *Led A* and *Led B*, respectively (see Table 2).

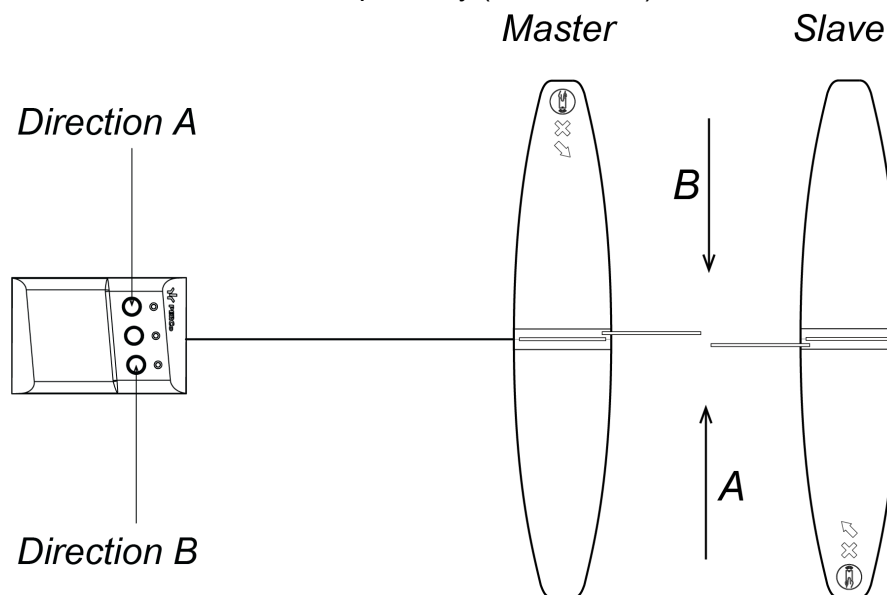


Figure 10. Standard orientation of the RC-panel towards the speed gate sections

Table 2. Connection of the RC-panel cable to the remote terminal block

No.	Contact	The orientation of the RC-panel	
		Standard	Reverse
8	<i>GND</i>	black	black
9	<i>Unlock A</i>	white	green
10	<i>Stop</i>	blue	blue
11	<i>Unlock B</i>	green	white
12	<i>Led A</i>	yellow	red
13	<i>Led Stop</i>	orange	orange
14	<i>Led B</i>	red	yellow
15	<i>Sound</i>	brown	brown

5.3.2 Fire Alarm device

Connection of the device for emergency opening of the *Fire Alarm* passage is made to the *Fire Alarm* input (contacts of the *Fire Alarm* and *GND* of the remote terminal block) in accordance with the speed gate wiring diagram (Fig. 17). Connection of the *Fire Alarm* device in order to control multiple speed gates at a single checkpoint is shown in Fig. 16. A serial wiring diagram is used to control multiple speed gates when a single *Fire Alarm* output is used.

When the *Fire Alarm* input is not used it is necessary to install a jumper wire between the *Fire Alarm* and *GND* contacts of the control board. By default, this jumper is installed.

The speed gate switches to the *Fire Alarm* mode when the control signal is sent to the *Fire Alarm* input:

- if the speed gate sliding panels were closed, then they will open in all operating modes and remain open for free passage in both directions;
- the green indicators of the passage granting will switch on in the flashing mode with a period of 1.25 seconds on the upper indication blocks simultaneously for both directions;
- all incoming control commands are ignored.

The speed gate will automatically switch to the operating mode in accordance with the control commands after the control signal has been removed.

5.3.3 Operation from the ACS

The speed gate can be used as an operating device being a part of the ACS. The speed gate provides the possibility to install built-in proximity card readers under the glass top cover.

The outputs of the ACS controller are connected to the *Unlock A*, *Stop*, *Unlock B* and *GND* contacts of the remote terminal block or, when installed inside the speed gate, directly to the control board to the corresponding contacts of the **X2** connector. Inputs of the ACS controller should be connected to *PASS A*, *PASS B* and *Common* contacts of the remote terminal block or **X3** connector of the control board. Connection must be done in accordance with the speed gate wiring diagrams (see Fig. 17 and 18).

5.4 Optional devices connected to the speed gate

The following outputs are available on the speed gate control board for connecting optional devices:

- *PASS A*, *PASS B*- for connecting to the ACS controller inputs (see section 5.4.1).
- *ALARM*- for siren connection (see section.5.4.2).
- *Light A* and *Light B*-for remote indication blocks connection (see sect. 5.4.3).

5.4.1 PASS Outputs

PASS A, *PASS B* Relay outputs have normally closed contacts. The *Common* relay contact is not connected to the negative terminal of the speed gate power supply. In normalized state the voltage on the relay coil is not supplied.

The outputs are activated upon the passage registration in the specified direction. When the voltage is supplied to the relay coil, the relay contacts close. The fact of supplying voltage to the relay coil can be determined by the red LED on the control board near the corresponding relay (if the control board features an installed jumper on the **XP3 (+12V)** connector).

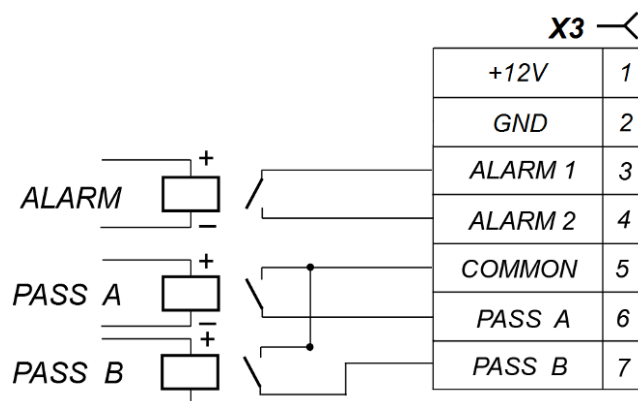


Figure 11. Output stage for PASS A, PASS B and Alarm

Output stages - relay contacts (Fig. 11) with the following signal characteristics:

maximum commutating voltage DC	42 V
maximum commutated current	0.25 mA
closed contact resistance	max. 0.15 Ohms

5.4.2 Siren

The siren is connected to the *ALARM* relay output of the control board via *ALARM 1*, *ALARM 2*, *GND* and + 12V contacts of the remote terminal block in accordance with the speed gate wiring diagram (Fig. 17).

The voltage is not supplied on the relay coil in the normalized state, the relay contacts are opened. The output is activated by the passage sensors during an unauthorized passage attempt, as well as during switching to "Alarm" mode (see section 9.4). When the voltage is supplied to the relay coil, the relay contacts close. The fact of supplying voltage to the relay coil can be determined by the red LED on the control board near the corresponding relay (the jumper has to be installed on the **XP3 (+12V)** connector of the control board).

Output stage - relay contacts (Fig. 3) with the following signal characteristics:

maximum commutating voltage	42 V DC
maximum commutated current	0.25 mA
closed contact resistance	max. 0.15 Ohms

The maximum current consumption of the siren when it is connected to + 12V contact of remote terminal block should not exceed 0.3 A.

5.4.3 Remote indication blocks

Remote indication blocks for the corresponding passage directions are connected to *LIGHT A* and *LIGHT B* outputs. The outputs feature a complete set of contacts: *NO* normally open, *NC* normally closed and *C* common outputs. Connection to the outputs should be performed via corresponding contacts of the remote terminal block.

While passage granting indication in direction A / B is on, the *LIGHT A* / *LIGHT B* relay of the corresponding direction is activated (the coil is energized), and normalized upon passage denial indication. The fact of power supply to the relay coil can be determined by the active red LED on the control board located by the corresponding relay.

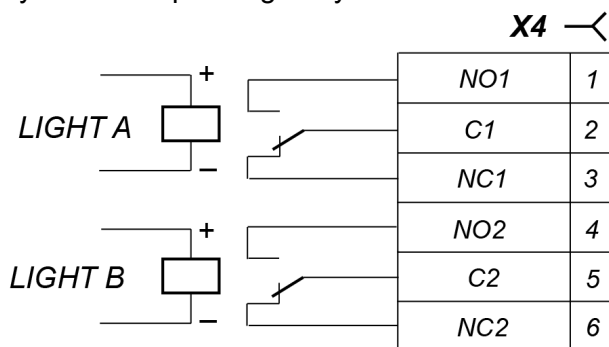


Figure 12. Output stages for Light A and Light B

Output stages for *LIGHT A* and *LIGHT B* – relay changeover contacts (see Fig. 4) with the following signal characteristics:

maximum commutating voltage	30 V DC
maximum commutating voltage	42 V AC
maximum commutating current.....	3 A DC / AC
resistance of the closed contact	max. 0.15 Ohms

6 MARKING AND PACKAGING

Each speed gate section features a marking sticker on the internal surface of the section under the side panel (6) (see Fig. 3 and 4). The sticker contains: trademark and contact details of the manufacturer, section name and serial number of the product, date of manufacture, supply voltage and power consumption. There are also stickers that indicate the side of the section (*Master* or *Slave*) in **STD-02** double-sided section, located under the side panels.

Also, the *Master* section and the double-sided section have a sticker located on the inner surface of the side panel (6). The label contains a wiring diagram that is similar to that shown in Fig. 17.

The speed gate in the standard delivery set is packed in shipping boxes that protect it from being damaged during transportation and storage. Parts and fasteners of each section are supplied in two boxes, fastened together. The total number of boxes (assemblies) depends on the ordered delivery set.

Overall dimensions of transportation boxes (length × width × height):

ST-02.600:

box No.1, box No.3	205×45×121 cm
box No.2, box No.4	131×45×27 cm

STD-02.600:

box No.1	205×45×121 cm
box No.2	131×45×27 cm

ST-02.900:

box No.1, box No.3	205×60×121 cm
box No.2, box No.4	131×60×27 cm

STD-02.900, STD-02.600/900:

box No.1	205×60×121 cm
box No.2	131×60×27 cm

Weight (gross) of transportation boxes:

ST-02.600:

box No.1, box No.3	max. 255 kg each
box No.2, box No.4	max. 55 kg each

STD-02.600:

box No.1	max. 268 kg
box No.2	max. 58 kg

ST-02.900:

box No.1, box No.3	max. 265 kg each
box No.2, box No.4	max. 65 kg each

STD-02.900, STD-02.600/900:

box No.1	max. 280 kg
box No.2	max. 68 kg

7 SAFETY REQUIREMENTS

7.1 Installation safety requirements

Installation of the speed gate should be carried out by persons who have fully studied this manual and briefed the safety instruction, in compliance with the General rules of electrical and installation works.



Attention!

- **All installation work is carried out only when all power sources, both main and backup (emergency) are switched off!**
- Use only properly functioning tools during the mounting procedures.
- The speed gate sections are heavy and require at least 4 people to unpacking and moving procedures. Installation of glass top covers and sliding panels, replacement of the filling glasses should be carried out by at least two persons.
- The use of protective gloves is mandatory! Parts of the housing are made of stainless steel and may have sharp edges.
- Be especially careful and accurate when installing the speed gate sections and prevent them from falling over when they are not fixed yet.
- **Be careful, do not to insert your fingers into the technological slots and holes of the housing in order to avoid injuries, use a special tool instead!**
- Make sure that installation and all connections are correct before you turn the speed gate on for the first time.

Installation of power supplies should be carried out in accordance with the safety precautions given in their service documentation.

7.2 Operation safety requirements

General safety rules must be observed prior to operating the speed gate.



Do not!

- Operate the speed gate in conditions that do not meet the requirements of the section 2.
- Do not operate the speed gate at a voltage different from that is specified in the section 3.

Power supply units should be used in accordance with the safety precautions given in their operational documentation.

8 INSTALLATION

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

Installation of the speed gate is a responsible mission, which largely defines the performance and service life of the product. Installation must be carried out by at least four people, of which at least two must have the qualifications of an installer and an electrician. You should carefully study this section and follow the instructions before starting the installation procedure.



Attention!

The speed gate is a complex technical device, **perform the installation operations by constantly following the instructions described in the section 8.4**, thus you do not have to repeat them again.

8.1 Installation details

Recommendations for the mounting surface preparations:

- It is obligatory to mount speed gate sections on solid and even concrete (not below 400 grade, strength class B22,5), stone, etc. surfaces that have a thickness of more than 150 mm.
- The mounting surface must be evened so that all mounting points of the speed gate section lie in the same horizontal plane (check it with level).
- When installing the speed gate section on a less solid foundation, it is necessary to use reinforcing elements with a size of at least 450×450×200 mm.

8.2 Tools and equipment required for installation

It is recommended to use the following tools and equipment for the speed gate installation:

- two crowbars (or pipe section with a diameter up to 28 mm) to move the sections of the speed gate;
- 1.2÷1.5 kW electric drill;
- Ø16 mm carbide drill for anchor sleeves;
- Slitting tool for the cable channels;
- flat head screwdriver;
- PH1, PH2 Phillips head screwdrivers;
- S8, S13 open end wrench;
- SW3, SW4, SW5, SW8 Allen wrenches;
- rubber mallet;
- level;
- roulette 2 m.



Note:

It is allowed to use other equipment and measuring tools that meet the required parameters.

8.3 Cable length

The cables used for installation are shown in Table 3.

Table 3. The cables used during installation

No	Equipment	Cable length, m, max	Cable type	Crossection, mm ² , min	Cable example
1	Speed gate power supply	10	Twin wire	1.5	AWG 15; HO5VV 2×1.5 two-tone
		20	Twin wire	2.5	AWG 13; HO5VV 2×2.5 two-tone
2	- Fire Alarm Device - Optional equipment to input or output of the control board	30	Twin wire	0.2	RAMCRO SS22AF-T 2×0.22 CQR-2
3	RC-panel	40	Eight core cable	0.2	CQR CABS8 8×0.22 c
4	ACS controller	30	Six core cable	0.2	CQR CABS6 6×0.22 c

8.4 Installation procedure



Attention!

The manufacturer is not responsible for damages that were caused because of improper installation and will reject any claim if the installation is not carried out in accordance with the instructions given in this operating manual.

The installation operations are given with regards to recommendations described in section 8.1, detailed installation and dismantling of individual parts of the speed gate are described in section 8.7. Equipment and tools required for installation are listed in the section 8.2. The types of cables used for installation are listed in section 8.3. Marking layout of the installation surface is given in sect. 8.5. Wiring diagrams are given in section 8.6.

Item numbers are shown in accordance with Fig. 3 and 4.



Attention!

- The speed gate sections are heavy. Moving of the speed gate sections should be carried out only with the use of the mounting tool, use the special clamps located at the front ends of the section under the front end panels, do not try to lift them by holding the glass top covers or other elements of the housing!
- Installation and fastening of the speed gate sections should be carried out after routing of all cables in cable channels and within sections.
- Be especially careful and protect the sections as well as parts of the sections from falling in order to prevent from damage while your disassembly the parts of the speed gate sections before they are fixed on the mounting surface.

Follow the next steps during installation procedure¹:

1. Install the power supply into the place in accordance with its service documentation.
2. Determine locations for the *Master* and *Slave* sections and, if necessary, determine locations for the double-sided sections. It is necessary to pay attention to the mutual arrangement of sections: you should always place the panel of the *Master* section (side of the double-sided section) towards the panel of the *Slave* section (side of the double-sided section). *Master* or *Slave* side of the double-sided **STD-02** section can be identified by means of stickers located under the side panels (6).

¹ The Video Guide section on the website www.perco.ru contains video guide on assembly and installation of ST-02.

3. Mark and drill holes for anchor sleeves on the mounting surface for fastening speed gate sections in accordance with the layouts, presented in Fig. 13-15 and in compliance with the checkpoint project. Use a carbide drill to drill holes. The drilling depth for the standard PFG IH10 anchors should be 65 mm.



Note:

It is acceptable to use the base of the section as a template for marking holes. To do this, you must first unpack the section and remove its base (see below, Section 7).



Attention!

It is necessary to leave a gap of at least 70 mm between the side of the section and the wall in order to ensure ease of installation of the speed gate sections.

4. Prepare the floor cable channels:
 - channels for cable connection from external devices – power supply (12), RC-panel (11) or ACS-controller, *Fire Alarm* (13) device and other optional equipment- to the input holes of the *Master* section and to the input of the double-sided sections;
 - channels that connect holes for leading in cables of opposite sections (sides of double-sided section) of one passage lane – for leading in DC (9) and CAN (10)¹ connection cables, and also for installation of built-in readers – cable for reader connection from the *Slave* section to the ACS controller (RF cable on layout in Fig. 16 and Fig. 18).



Attention!

Passageways that are limited by one-sided sections and/or sides of double-sided sections are separate functional devices that are not directly connected to each other.

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

5. Route all required cables in the cable channels (see above, p.4).
6. Install the anchor sleeves in the holes so that they do not project above the floor surface.
7. Unpack the *Master* section (**ST-02/M**, boxes No.1 and No.2).



Note:

Box No. 1 (3) consists of a bottom that holds a section of the speed gate with transport bolts, and an top box. It is necessary to remove the fixed top box No. 2 (No. 4), then unscrew the screws around the perimeter of the bottom, and separate the top box. It is enough to unscrew the screws from one of the side covers of the box so the top box could be easily removed.

In order to take the section off the bottom of the shipping box:

- Dismantle the front end panels (7) (see sect.8.7.1, Fig. 19). Be careful, do not damage the connection cable of the front end indication block (8)!
 - Remove the section from its base (see Fig. 20) and place it on a flat, stable surface. Move the section by using two crowbars inserted into special eyelets located on the front ends of the speed gate, four people should carry out the procedure!
 - Unscrew the base from the bottom of the box and remove it.
8. Install base of the *Master* section on the sleeve anchors. Pull out the ends of all cables connected to the section through the cable entry hole located on the base of the *Master* section.
 9. Secure the base of the *Master* section on the mounting surface by using six M10 anchor bolts and washers.
 10. Install the *Master* section on the base by pulling its connection cables inside. Secure the section to the base with the four M8 set screws by using the SW4 Allen wrench (see Fig. 20). If necessary, it is possible to disconnect and extend one or two removable parts of the housing along the X-axis for more convenient cabling inside the housing section (see section.8.7.3, Fig. 21).

¹ Included in the standard delivery set.

11. Check the vertical position of the section with level, the vertical deviation of the section in the X-axis should not exceed 0.5 °. Use the special screws at the base of the section for alignment (you will need to remove the section from the base to access them). It is allowed to use mounting gaskets.

**Note:**

The following paragraphs 12 – 14 should be carried out during installation of the additional **STD-02** double-sided section.

12. Unpack and install the double-sided section. Follow the actions specified in Sections 7 – 11, align the double-sided section so that its *Slave* side (indicated on the sticker) is placed towards the *Master* section.
13. Route cables inside section used for controlling the second passage lane. The hole for cable entry is located at the base of the double-sided section (from the side of the *Master* section): from the power supply, from the RC-panel or ACS controller, from the *Fire Alarm* device and optional equipment, as well as DC and CAN cables of the *Slave* section.
14. If necessary, install other double-sided sections (paragraphs 14 to 16).
15. Unpack and install the *Slave* section (**ST-02/S**, boxes No.3 and No.4). Follow the steps specified in paragraphs 7 - 11.

**Note:**

The following paragraphs 16 to 21 shall be carried out for each individual passage lane.

16. Remove the two screws that secure the terminal blocks to the bottom of the *Master* and *Slave* sections (sides of the sections) to the housing (see Fig. 5), and take them out, be careful – do not damage the internal wiring that leads to the terminal blocks!
17. Take out the external connection cables from the inside of each section (the sides of the section) and connect them to the remote terminal block in accordance with the speed gate wiring diagram (see Fig. 17). Mount and secure the remote terminal block. Carefully lay down the connected cables inside the housing of the section.

**Note:**

DC and CAN connection cables are connected to the remote terminal block of the speed gate sections in accordance with the core marking.

18. If necessary, install the access card reader and ACS controller – card readers are mounted on special brackets located inside of the sections under the top indication blocks or directly on the bottom of the indication blocks (**MR07 OEM**); the ACS controller is mounted in the opening of the section housing, under the speed gate top cover by means of self-adhesive clips from the delivery set (see Fig. 20).

**Attention!**

By default, it is possible to install the **PERCo** access card reader and ACS controller inside of the speed gate section.

Third-party hardware must meet the following requirements:

- overall dimensions of ACS controller,
(length × width × height) max. 160×140×40 mm
- reader overall dimensions,
(length × width × height) max. 230×72×32 mm
- passage sensors reading range min 40 mm
(**stable reading of the cards is not guaranteed in cases when the reading range of the installed readers is less than 40 mm**).

In order to increase the reading range, the readers should be as close to the top surface of the speed gate glass cover as possible. To do this, you can adjust the height of the bracket by using two screws (located under the shelf bracket). For more precise adjustment, it is recommended that the cover (3) with the top indication block is temporarily installed in its place and the front end panel is removed (7).

As a matter of convenience, inputs and outputs of the built-in ACS controller may be connected not to the DIN rail contacts, as shown in the layout (Fig. 17), but directly to the corresponding contacts of the control board (**X2** and **X3** connectors, Fig. 6). Connection layout variant is shown in Fig. 18 .



Note:

It is recommended to install the ACS controller *Ethernet* connector so it is faced in the direction of the sliding panel motor drive, to ensure more convenient access to it in the future.

Use double-sided tape to secure the readers. Carefully route the cables from the readers to the ACS controller (to the cable entry point from the ACS controller), by using the standard gaps in parts of the section housing. Use self-adhesive pads and cable ties to secure the cables.



Attention!

Do not route the connecting cables and wiring through the speed gate operating mechanism inside the housing of the section in order to avoid its failure!

19. Check that all electrical connections are correct and safe.
20. Check that the jumpers and switches on the speed gate control board are set correctly (see section 5.2.4). Set the speed gate operating mode (*pulse* or *potential*) by using the **Pulse** switch located on the control board, and set the speed gate operating mode (*normally open* or *normally closed*) by using **XP2 (Mode1)** jumper.
21. Unpack the sliding panels (1), filling glass (2), section glass covers (3), central inserts (4) and side panels (6) (boxes No.2, No.4).
22. Assemble the parts of all sections in the following order (see sect. 8.7):
 - Install the front end panels (7) (see sect.8.7.1 , Fig. 19). The panel with the front end indication block (8) must be mounted on the side of the section with the indication control module, and the corresponding connection cable must connect the indication control module and the front end indication block (see Fig. 19). The connection cable connected to the **ARROW** connector of the indication control module will activate the white arrow on the front end indication block. The cable connected to the **CROSS** connector will activate the red cross.
 - Mount the central insert (4) (see sect.8.7.4, Fig. 22).
 - Mount the filling glass (2) (see sec.8.7.5, Fig. 23).
 - Mount the sliding panels (1) (see sec.8.7.6, Fig. 24).



Note:

If needed, reduce the distance of the sliding panel departure from the housing of the **STD-02.900** double-sided section (for arrangement of the passageway with a width of 600 mm on one side), it is necessary to mount the sliding panel departure limiter and install a jumper on the sliding panels motor drive board (see section.8.7.9).

- Install the side panels (6) (see sect. 8.7.7, Fig. 25).
 - Mount the glass top covers (3) (see sect. 8.7.8, Fig. 26), the cover with the upper indication block (5) must be mounted on the side of the section with the indication control module, prior to that it is necessary to connect the appropriate connection cable from the indication control module to the upper indication block (see Fig. 19).
23. Test each passageway of the speed gate according to sec.9.1.
 24. Check the operation of all passage lanes of the speed gate by sending control commands from the RC-panel (see section.9.2, 9.3).

The speed gate is ready for operation after finishing installation and test procedures.

8.5 Mounting surface layout

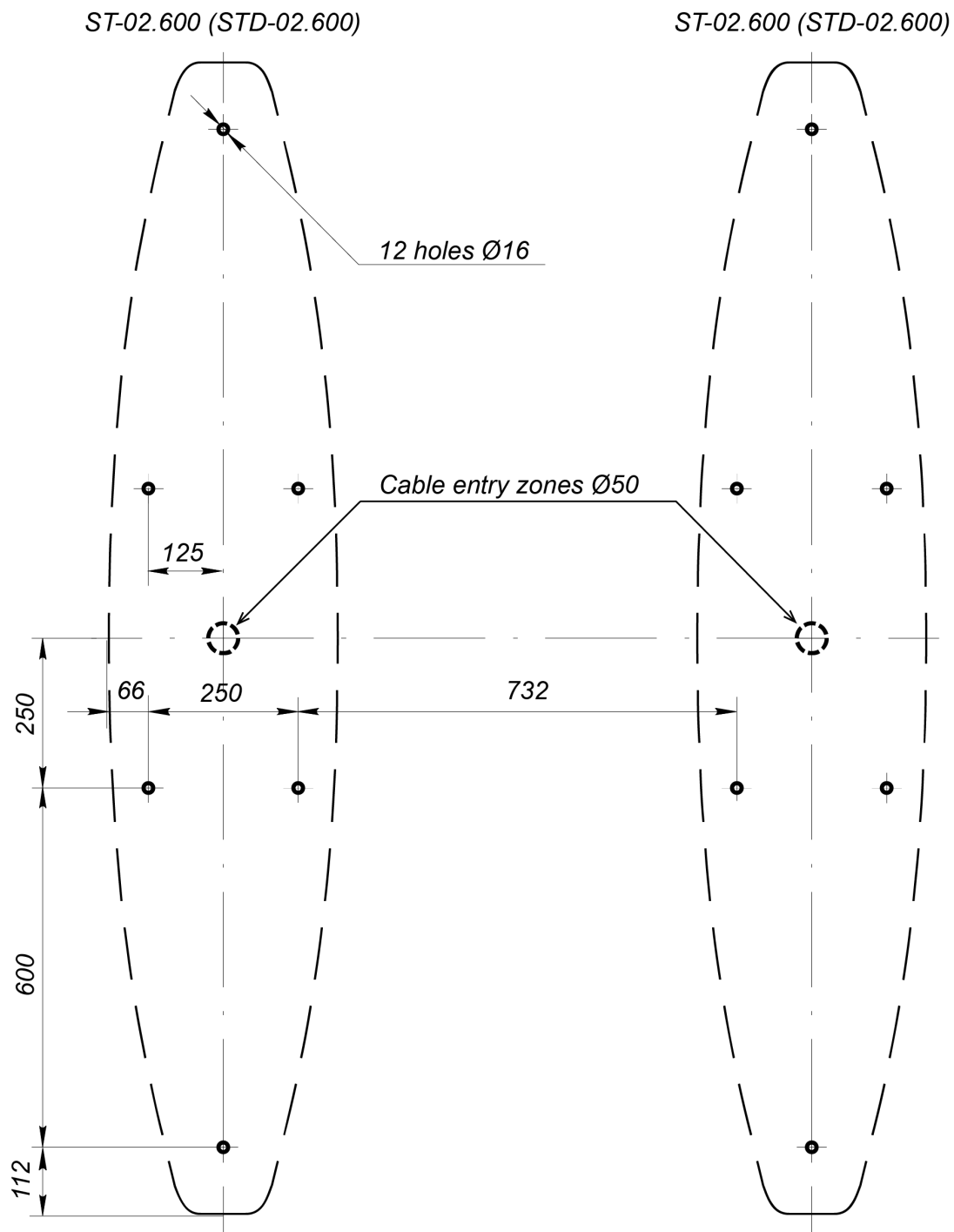


Figure 13. Layout for installation of the sections with the passageway width of 600 mm (ST-02.600, STD-02.600)

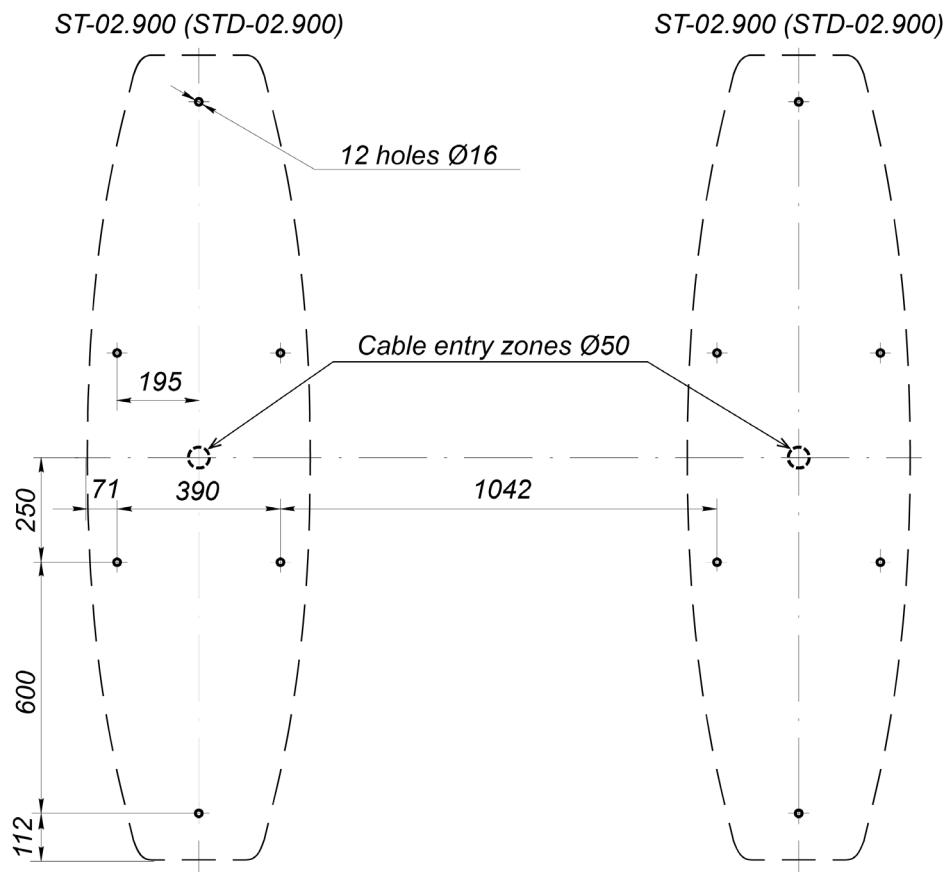


Figure 14. Layout for installation of the sections with the passageway width of 900 mm (ST-02.900, STD-02.900)

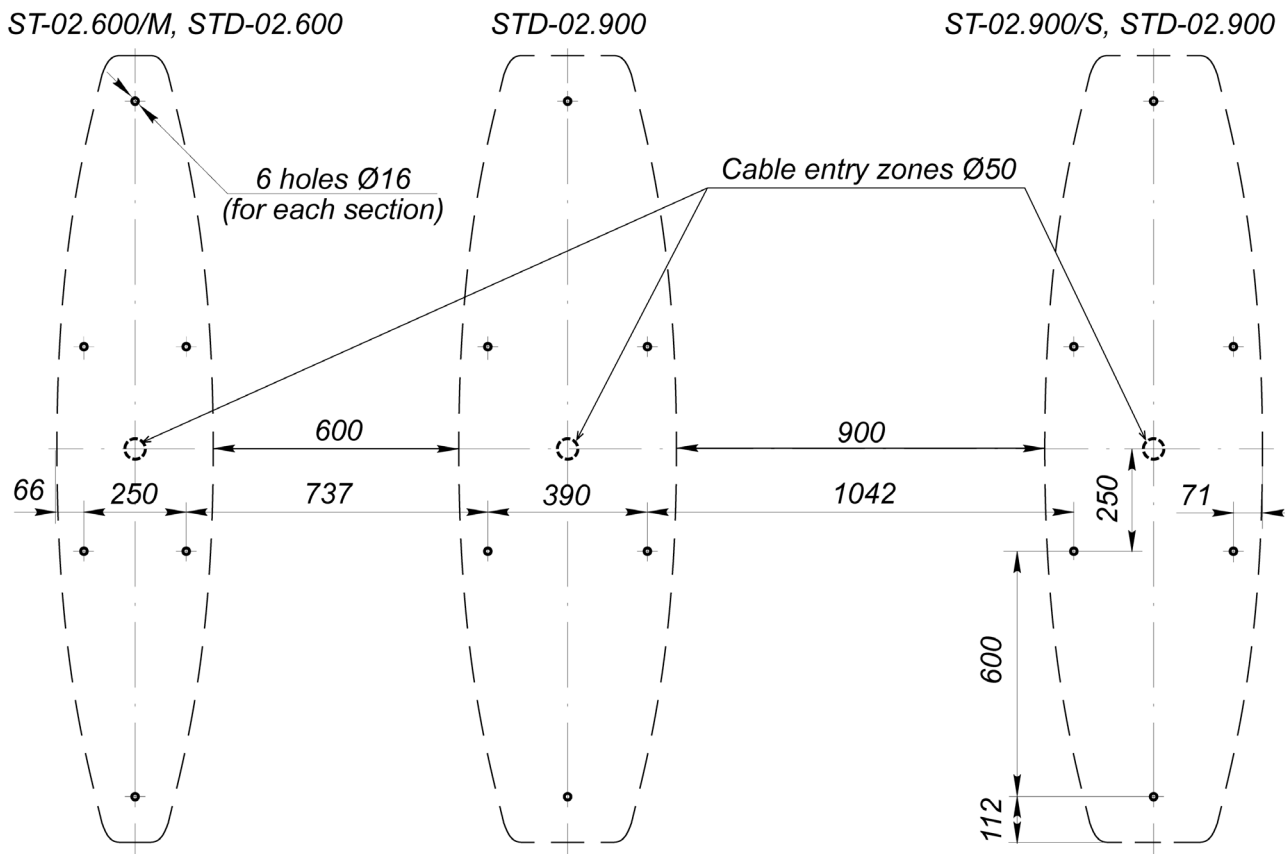


Figure 15. Layout for installation of the sections with different width of the passageway

8.6 Speed gate wiring diagram

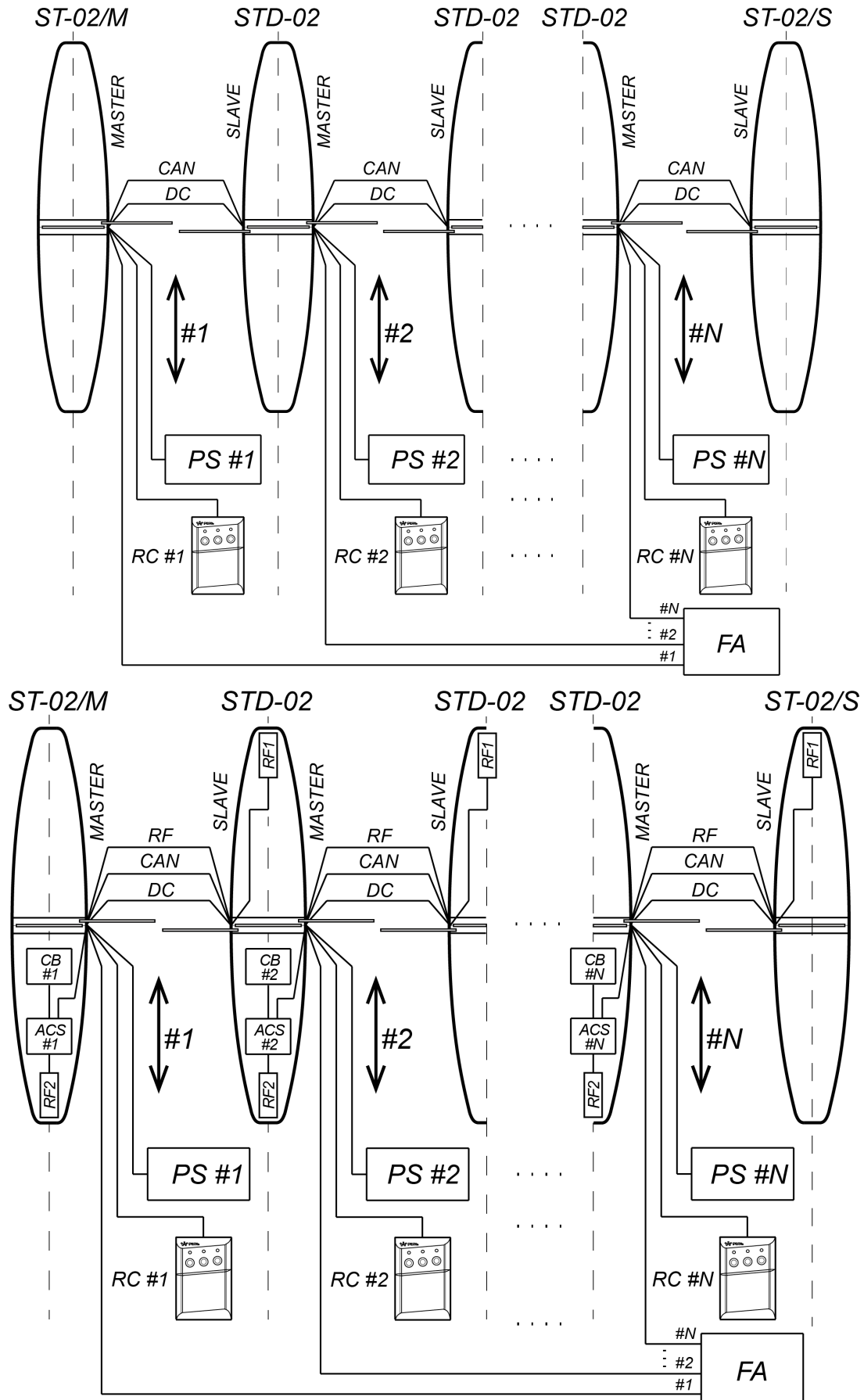


Figure 16. ST-02 and STD-02 wiring diagrams for the organization of a checkpoint with several (N) passage lanes

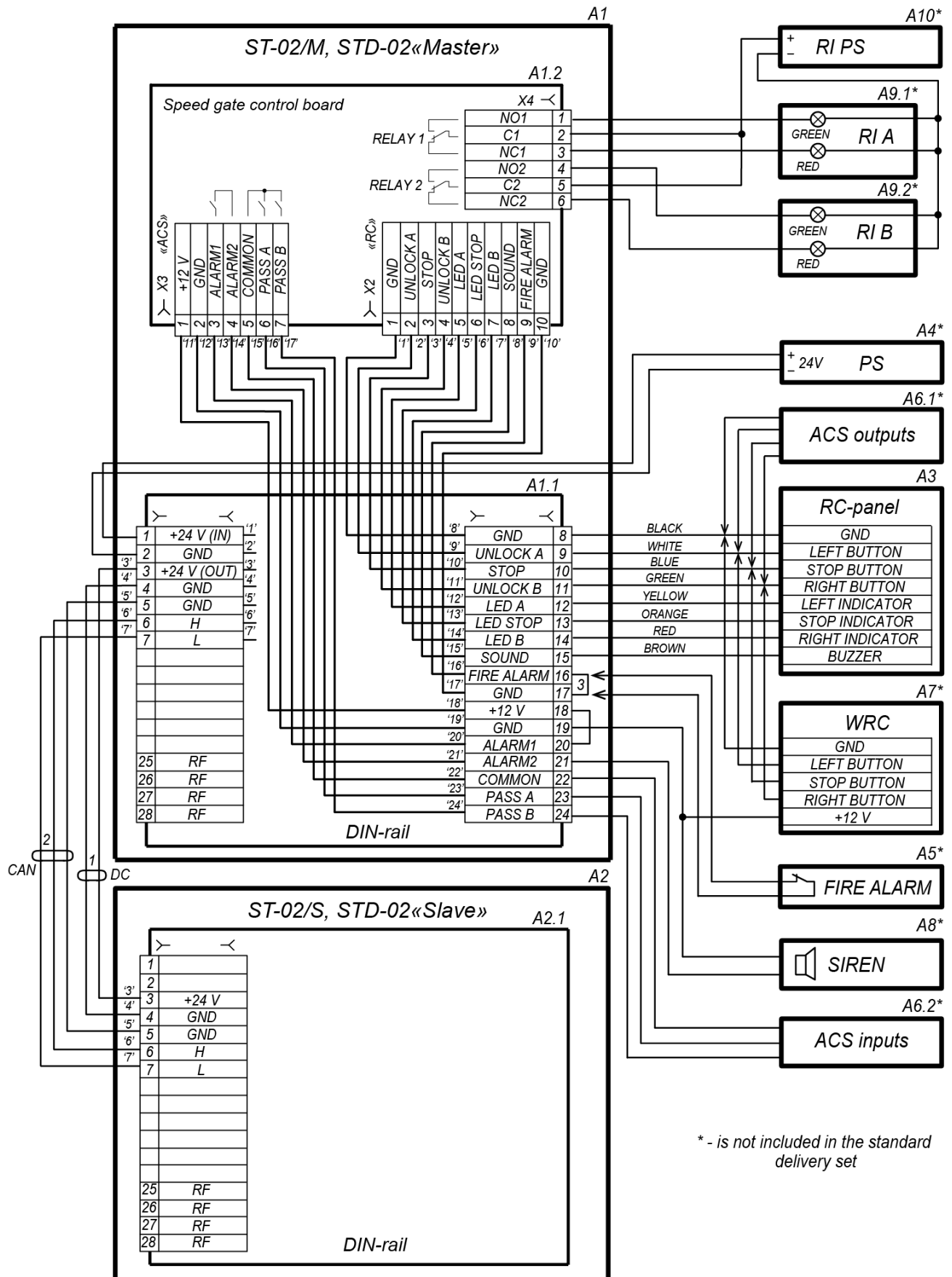
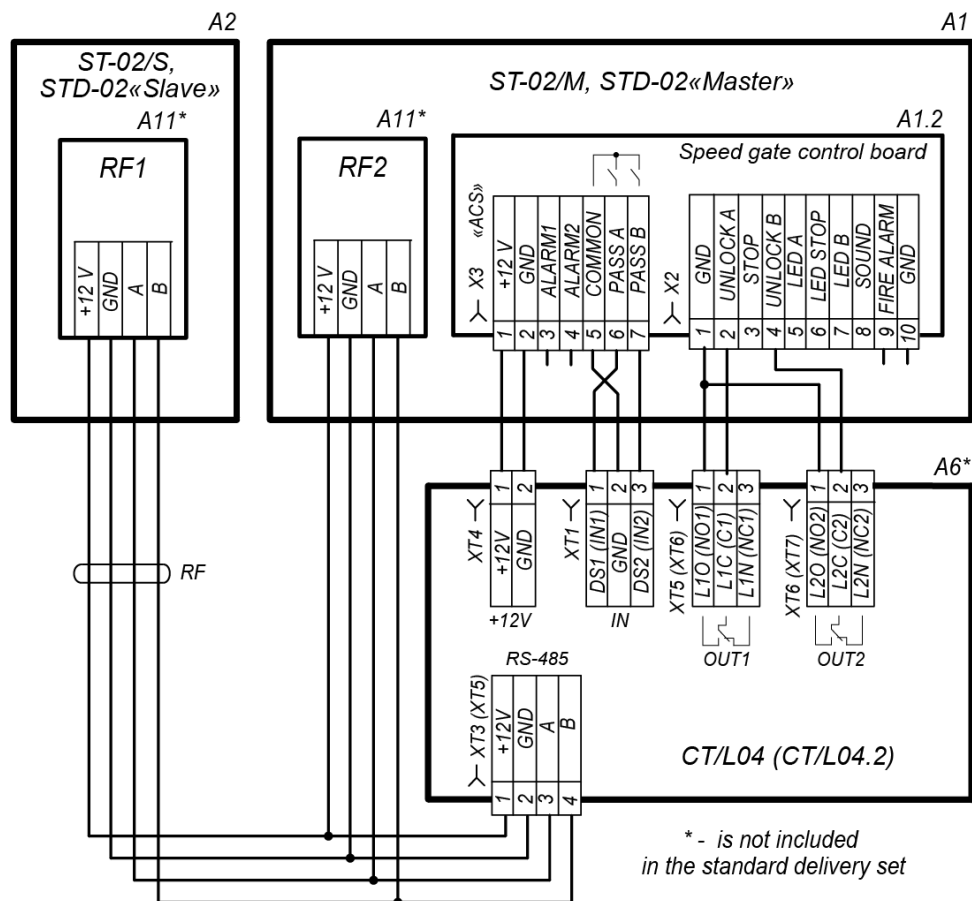


Figure 17. Speed gate wiring diagram

Table 4. Layout parts list of electrical connections

Item	Designation	QTY, PCs.
A1	<i>Master</i> section (side of the section)	1
A1.1	Remote terminal block (DIN rail) of the <i>Master</i> section	1
A1.2	Control board	1
A2	<i>Slave</i> section (side of the section)	1
A2.1	Remote terminal block (DIN rail) of the <i>Slave</i> section	1
A3	RC-panel	1
A4 ¹	Speed gate power supply	1
A5 ¹	Device for sending <i>FireAlarm</i> command	1
A6 ¹ (A6.1, A6.2)	ACS controller	1
A7 ¹	WRC-device	1
A8 ¹	12V DC siren	1
A9.1 ¹ , A9.2 ¹	Remote indication block	2
A10 ¹	Power supply for remote indicators	1
A11 ¹	RF1 and RF2 access card readers	2
1	DC connection cable	1
2	CAN connection cable	1
3	Jumper wire in case there is no <i>FireAlarm</i> device installed (A5). Installed by default	1

**Figure 18. Example of CT/L04 ACS controller connection to the speed gate**¹ The equipment is not included in the standard delivery set.

8.7 Installation and dismantling of the speed gate parts and elements



Attention!

Parts of the speed gate housing are made of polished stainless steel and glass. Be careful, prevent them from falling to avoid damages, place them on a flat, stable surface with the outer part up, protect from scratches.

8.7.1 Dismantling and installation of the front end panel

Follow these steps to remove each of the two front end panels (7) of the section:

1. Slide the panel up along the front end side of the section in order to remove it from the hooks (it is allowed to use a large flat screwdriver inserted into the slot at the bottom of the panel as a lever), then carefully move it away from the section (see Fig. 19) for about 10 cm. Be careful, do not damage the connection cable!
2. Disconnect the cable connector from the front end indication block board and remove the panel, put it on a flat surface with the outside facing upwards.

Installation of the front end panels is carried out in the reverse order, it is allowed to use a rubber mallet (only on the top edge!).

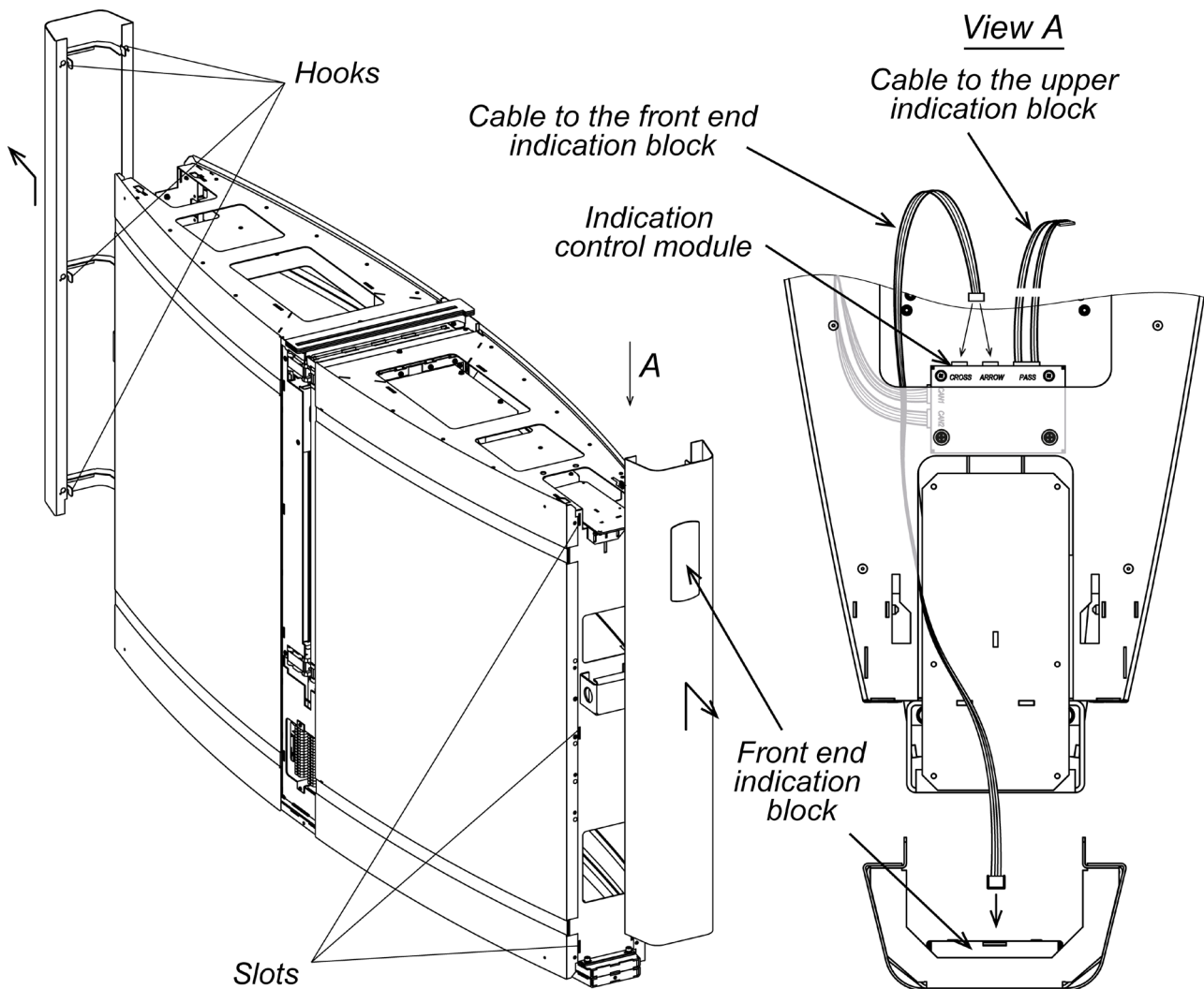


Figure 19. Dismantling of the front end panel

8.7.2 Removing the section from the housing

Follow these steps for removing a section from the housing:

1. Turn the four M8 screws all the way out with the SW4 Allen wrench (see Fig. 20).
2. Remove the section from the housing. The section is heavy, move it by using two crowbars inserted into special eyelets from the front ends of the speed gate, four people should carry out the procedure!
3. Place the section on a flat, steady surface.

Installation of the section on the housing must be done in reverse order.

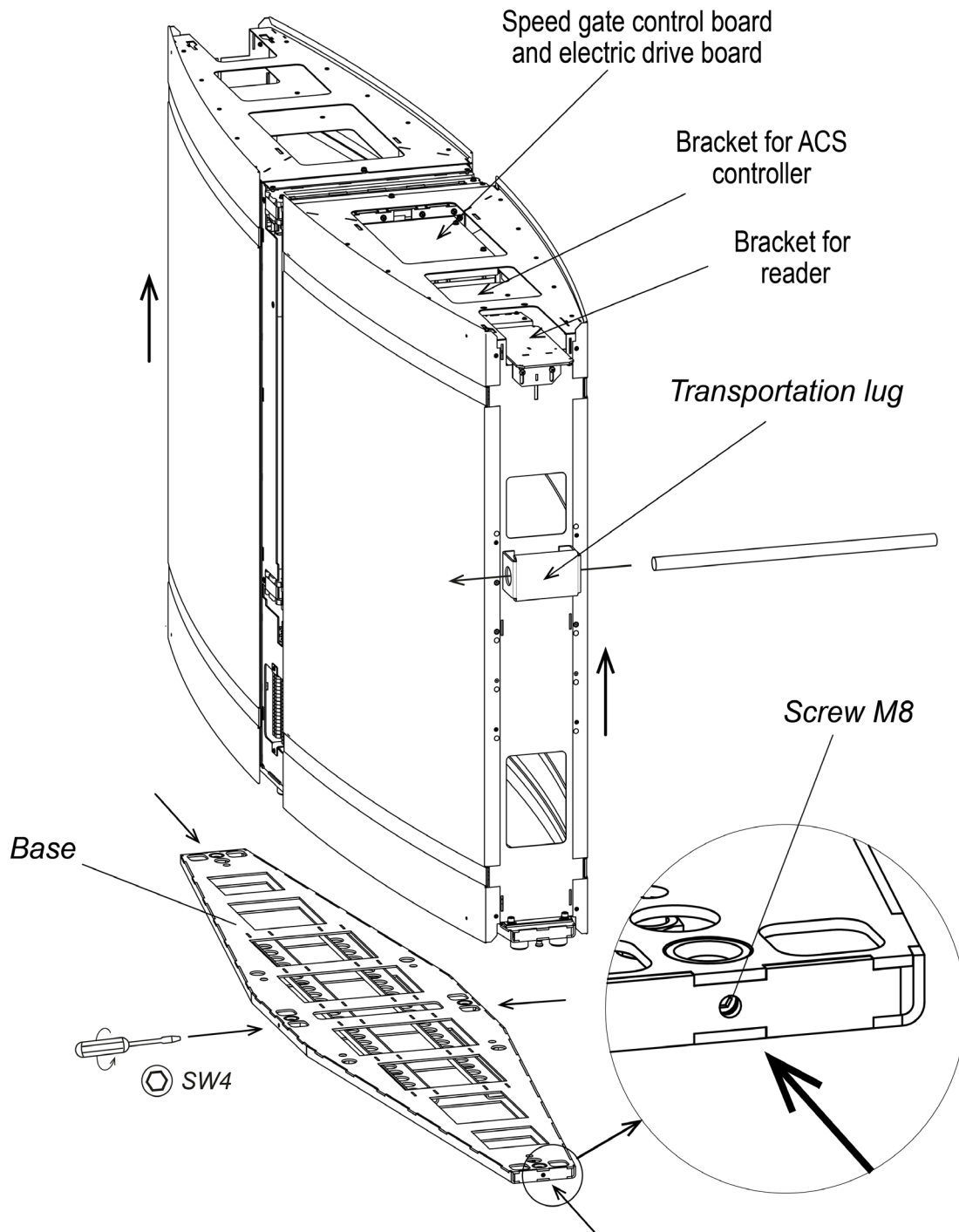


Figure 20. Removing the section from the housing

8.7.3 Dismantling and installation of the removable part of the section housing

It may be necessary to remove one of two (or both) removable parts of the housing in order to route the connection cables inside the speed gate housing (e.g. to the built-in controller or reader) (see Fig. 21). To do this, use the SW5 Allen wrench to unscrew two M6 screws, located at the bottom of the section front end, unscrew the M5 screw by using PH2 Phillips screwdriver, that is located on top of the center near the drive part of the speed gate, and carefully pull the removable part of the section along the longitudinal axis by 5-10 cm by using transportation eyelet in order to avoid damage of the speed gate internal wiring. You will first need to disconnect the internal wiring connectors if it becomes necessary to extend the removable part of the housing to a greater distance.

Connect the internal wiring connectors after you have routed the connection cables, then slide (with a jerk) the removable part of the housing into place, and tighten the mounting screws. Be careful, do not to damage the connection cables and internal wiring!

Adjustment plates can be installed between the removable part of the body and the housing, fixed by the M6 screws (Fig. 21). They are designed to align the gaps between the side panels of the speed gate (sect.8.7.7). If necessary, extra plates can be removed or, conversely, added if an additional adjustment of the gaps is required (additional plates are included in the standard delivery set).

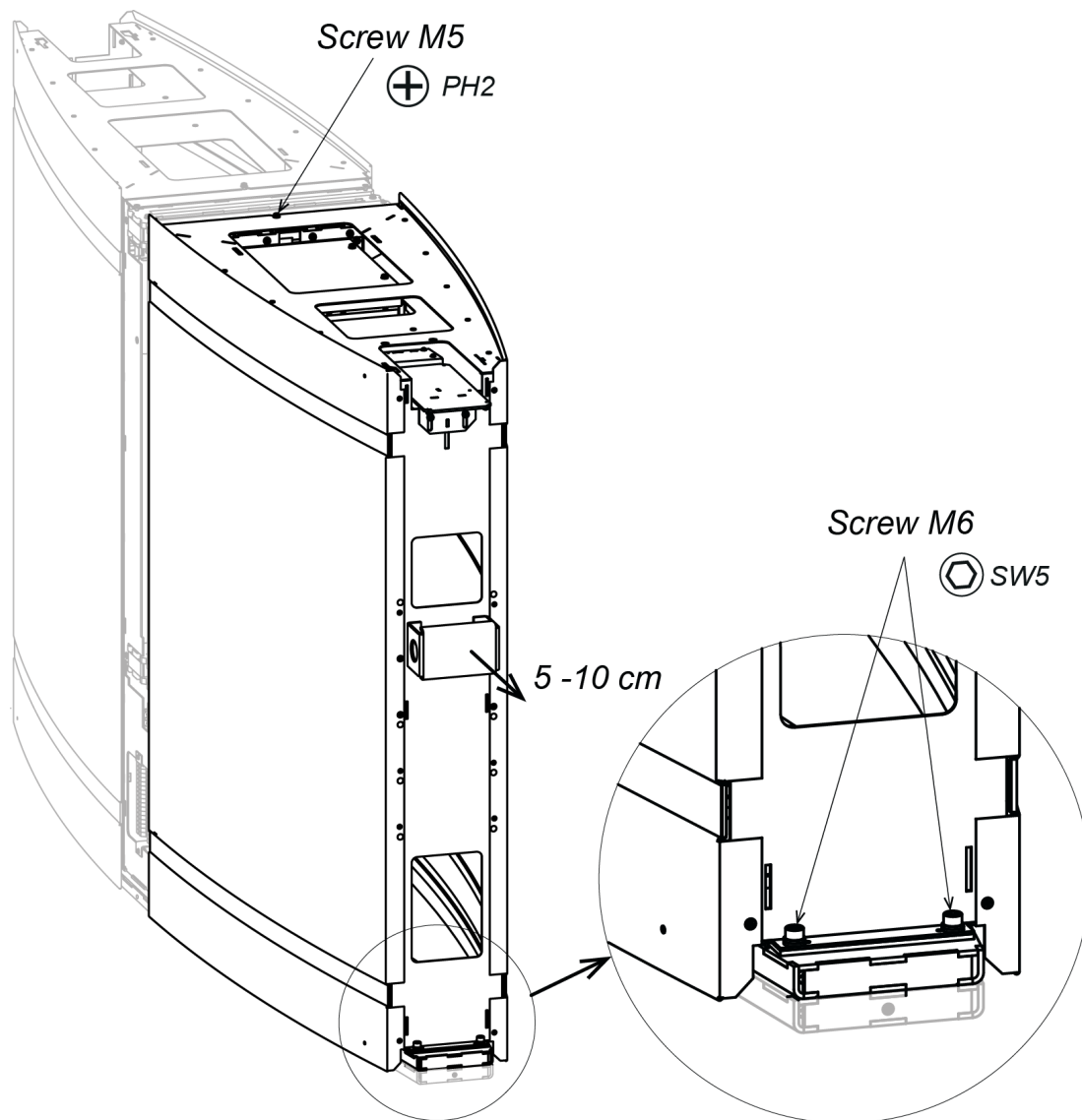


Figure 21. The removable part of the speed gate housing

8.7.4 Installation and dismantling of the central insert

Follow these steps in order to mount the central insert:

1. Take the central insert from the delivery set, mount it into place, while observing the location of its grooves in accordance with the location of the sliding panels.
2. Screw in the two M4×8 screws (see Fig. 22) with the washers by using PH2 Phillips screwdriver (installed by default).

Dismantling of the central insert needs to be done in the reverse order.

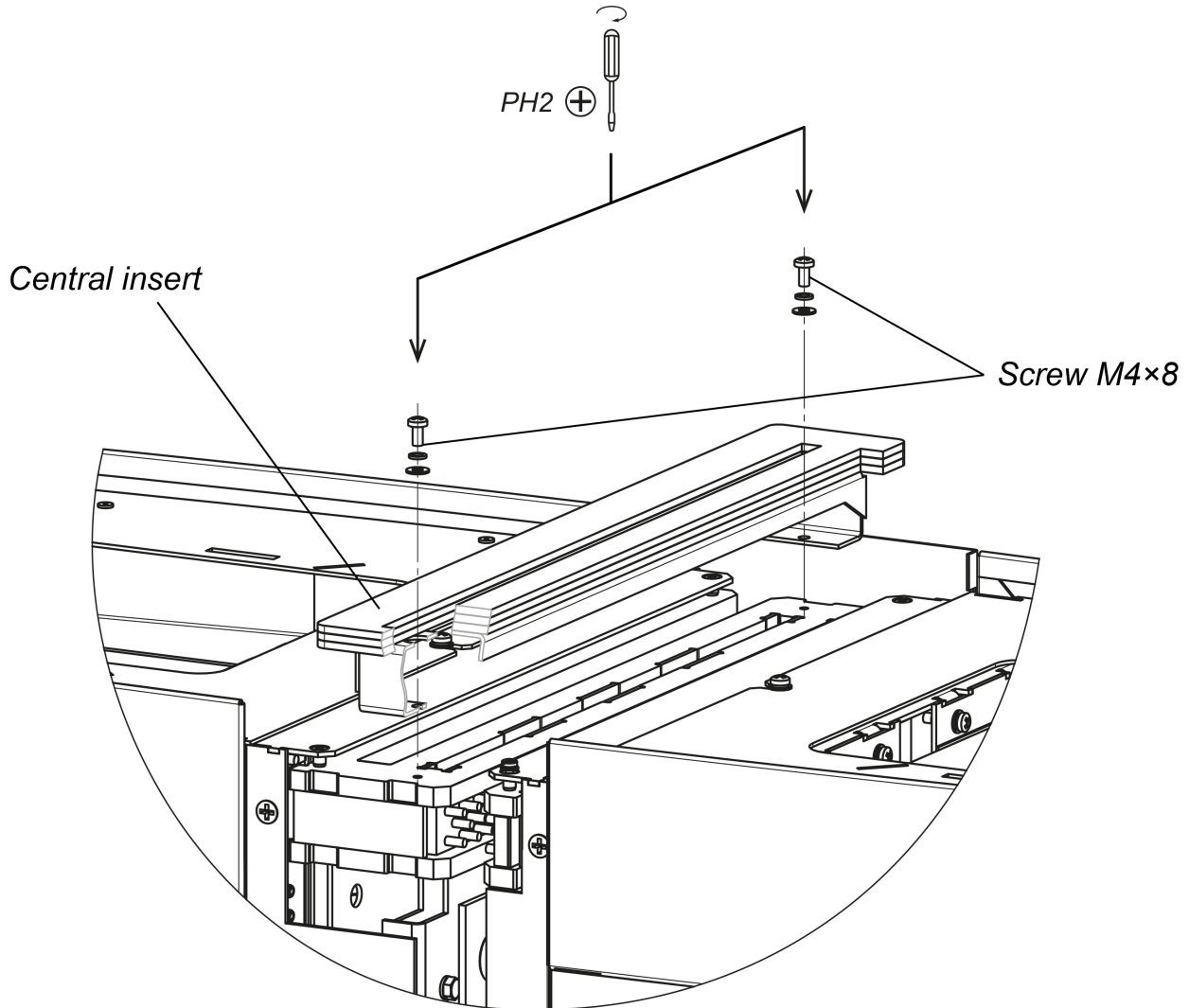


Figure 22. Installation of a central insert

8.7.5 Installation and dismantling of the filling glass



Attention!

In order to avoid injuries, **ensure** to disconnect the speed gate from the main and backup power before work!

Follow these steps to install the filling glass:

1. Loose the two M5 screws (4) that are located under the central insert on the sides by using S8 socket wrench (see Fig. 23).
2. Carefully install the filling glass with curly cutouts on the sides into the gap that is located in the center of the central insert all the way in.
3. Check that the glass is installed upright and align it if necessary. Tighten the mounting screws.

Dismantling of the filling glass needs to be done in the reverse order.

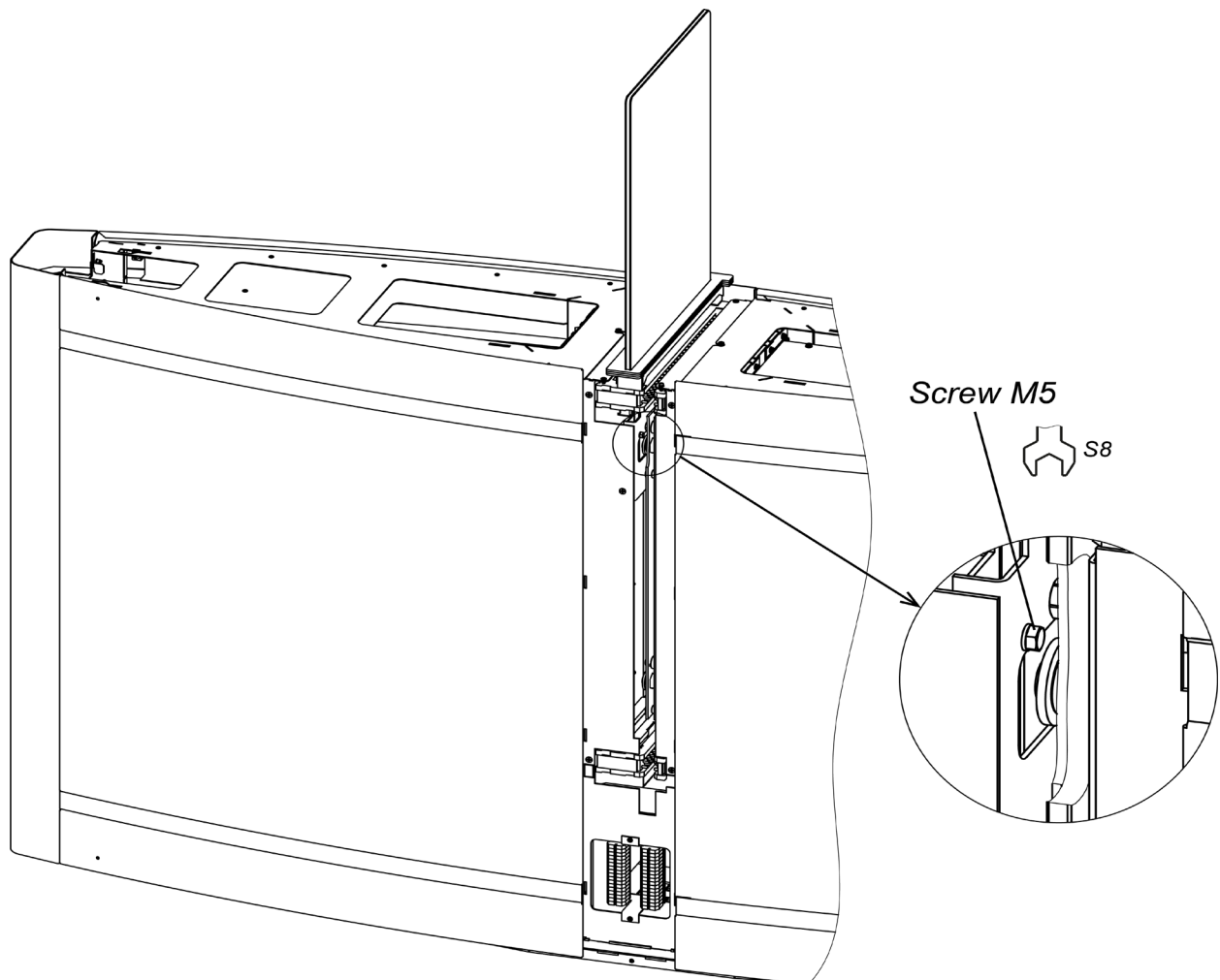


Figure 23. Dismantling of the filling glass

8.7.6 Installation and dismantling of the sliding panel



Attention!

Be careful! When you turn on the power of the speed gate, the sliding panels motor drive is automatically activated, but in order to avoid injuries, make sure that there are no tools, fingers, clothing items, as well as other foreign objects left in before you turn the mechanism on!

Follow these steps to install the sliding panel (2) on the speed gate section:

1. Power the speed gate and wait for a few seconds. The motor drive will work according to the calibration algorithm and move the sliding panel fixing bracket to its end position, the closest to the out from the section housing.

It is also possible to tighten the bracket by using a long screwdriver or other suitable tools through the upper gap between the central insert and the housing without powering the speed gate on.

2. Loosen the four M8 bolts on the top and bottom of the two fastenings of the sliding panel by using S13 open-ended wrench (see Fig. 24).
3. Hold the mounting bracket close to the out of the housing, take the sliding panel (work together!) and gently slide it with the side slots into the gap in the section housing. Insert the sliding panel with two large shaped slots in the corresponding fastenings by moving it forward and down.
4. Adjust the vertical position of the sliding panel and tighten the mounting bolts.
5. Switch the speed gate off.

Dismantling of the sliding panel has to be done in the reverse order.

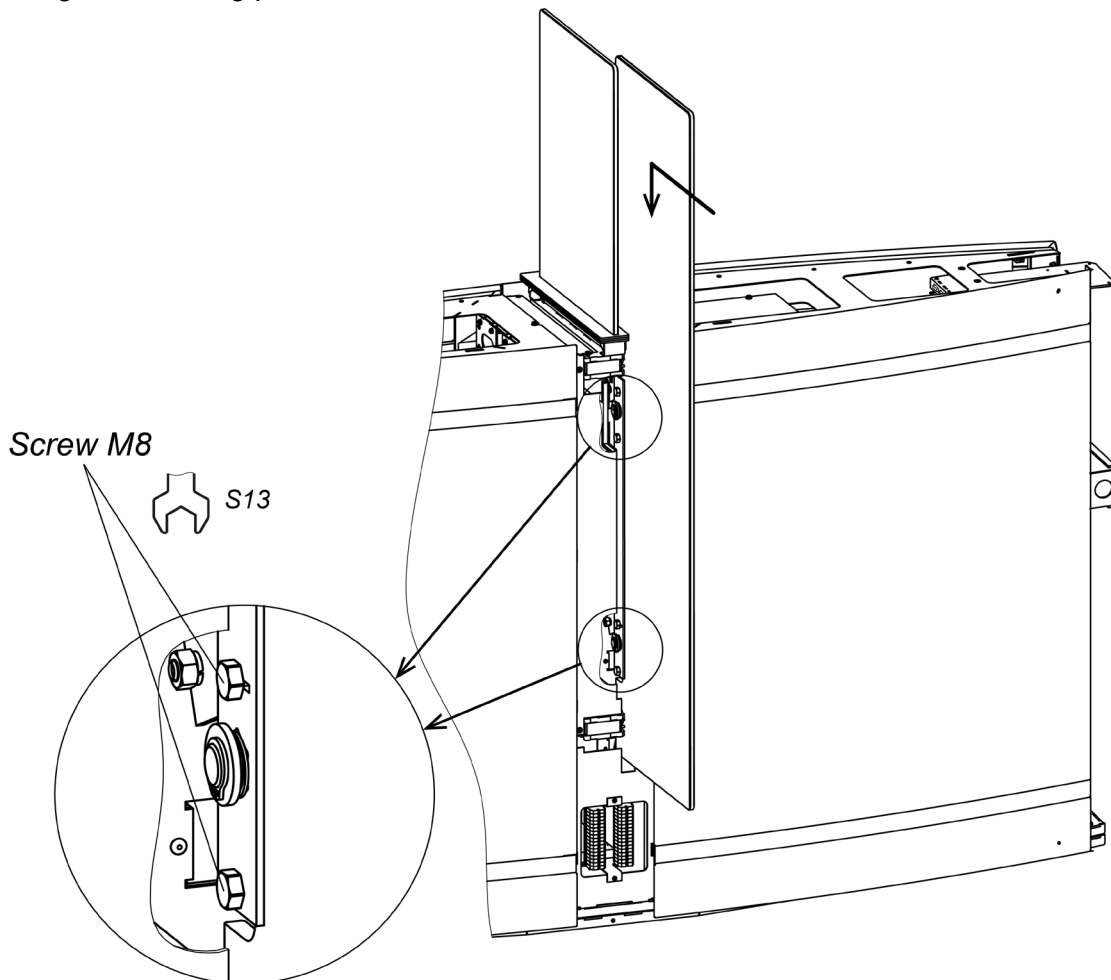


Figure 24. Installation of the sliding panel

8.7.7 Installation and dismantling of side panels

There are two types of side panels – external (mounted on the sections on the outside of the speed gate) and inner (mounted on the sections from the side of the passageway). Inner side panels, unlike the external, have cut-outs for the sliding panels. Both side panels of the **STD-02** double-sided section are inner.

The side panels are fixed to the sections by means of spring hooks; the inner panel is additionally fixed to the housing by two M3×8 screws with washers (installed by default, see Fig. 25). Align the spring hooks on the panel into the corresponding slots of the section housing and carefully mount the panel into its location until it stops. Check whether the hooks entered the slots around the perimeter of the panel.

After installing the panels, check the uniformity of the gaps between them and the speed gate housing, if necessary, the gaps can be adjusted by using the adjustment plates (see section 8.7.3).

Dismantling of the side panels needs to be done in the reverse order.

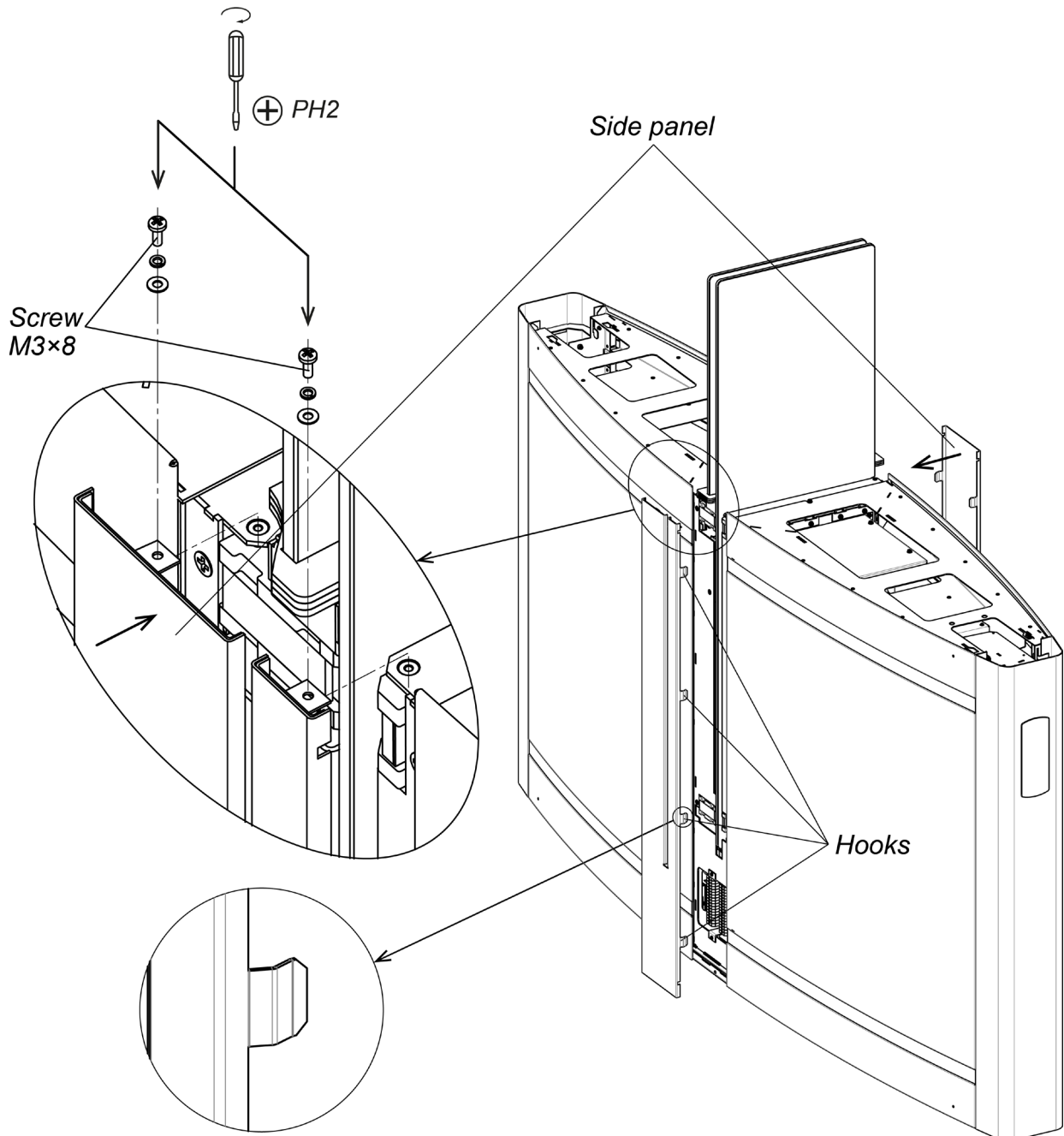


Figure 25. Installation of the side panels

8.7.8 Installation and dismantling of glass covers

The top of the section housing is covered with two glass top covers (4). Follow these steps in order to install each cover:

1. Unscrew the two M6×16 set screws all the way out by using SW3 Allen wrench through the holes on top of the section front end (see Fig. 26).
2. Take the section glass cover, place it on top of the section front end, pull it out a few millimeters away from the central insert so that the hooks from the bottom of the cover fall into the corresponding slots in the speed gate housing, and gently slide it into place until it stops.



Note:

Covers with the upper indication block must be installed on the side of the section with the indication control module, prior to this it is necessary to connect the appropriate connection cable from the indication control module to the upper indication block, see Fig. 19 and 26.

3. Tighten the set screws.

Dismantling of the section glass top covers needs to be done in the reverse order.

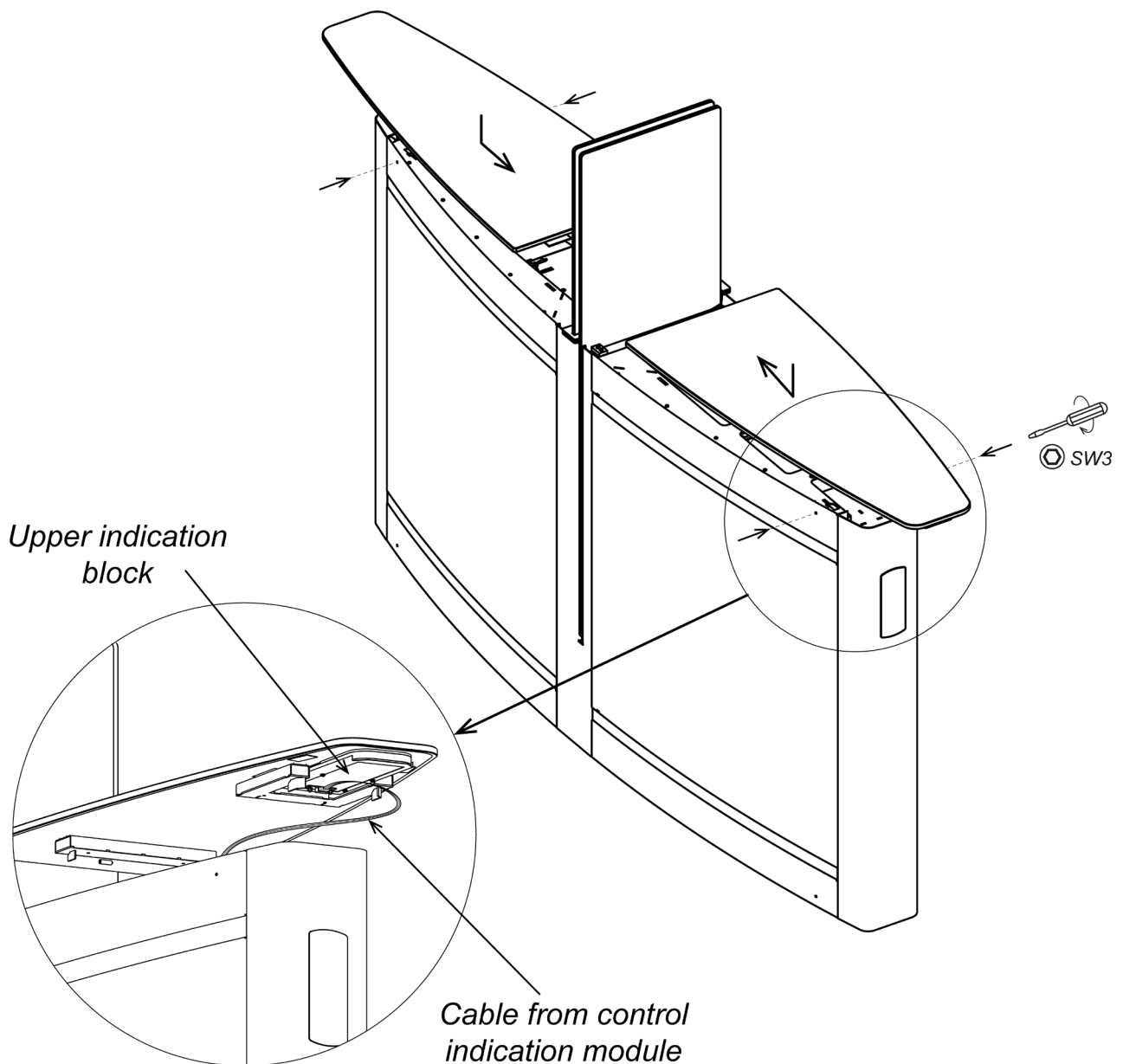


Figure 26. Installation of the glass top covers



Attention!

During long-term and intensive operation of the turnstile with built-in readers, scratches and scuff marks can appear on the glass surface either from access cards presentation (as well as from wallets, bags, wristbands, watches, rings, etc.) or from cleaning substances with abrasive inclusion.

Such damages are not a warranty case.

In order to prevent or remove such damages manufacturer has provided self-adhesive rubber pads for card presentation areas (see Fig. 27). Moreover, consumer can use the services of special companies providing professional glass polishing or purchase new covers for replacement from PERCo.

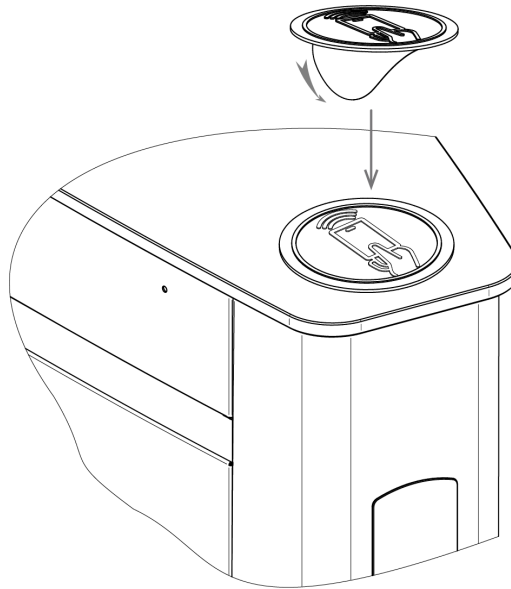


Figure 27. Gluing rubber cover on glass top cover

8.7.9 The reduction of the passageway width of STD-02.900 section

Design of the **STD-02.900** Double-sided section allows you to reduce the distance of departure of the sliding panel from the housing to 280 mm in order to arrange the passageway with a width of 600 mm.

To do this, it is necessary to mount the sliding panel departure limiter:

1. Remove the sliding panel from the required side of the section (see sect.8.7.6).
2. Stick the reflector supplied in the delivery set (see Fig. 28), so:
 - take a special template from the delivery set, install it in the sliding panel slot, as shown in the figure;
 - remove the protective film from the adhesive surface of the reflector and stick it with a strong push in accordance with the template, it is recommended to degrease and dry the place of gluing;
 - remove the template, check the adhesion strength of the reflector.
- Install the sliding panel into its place (see sect. 8.7.6).
- Turn off the power of the speed gate.
- Install the two supplied special stops on the section housing and secure each with three M4×8 screws (see Fig. 29):
- Install the jumper on the **XP3 "Mode"** connector of the motor drive board for this sliding panel (see Fig. 30).



Note:

The sliding panel motor drive board is located under the glass top cover of the speed gate, on the right side of the sliding panel and inside the gap of the section housing, see Fig. 6 (together with the control board from the *Master* section side).

- Turn on and check the operation of the speed gate for each of the passageways separately.

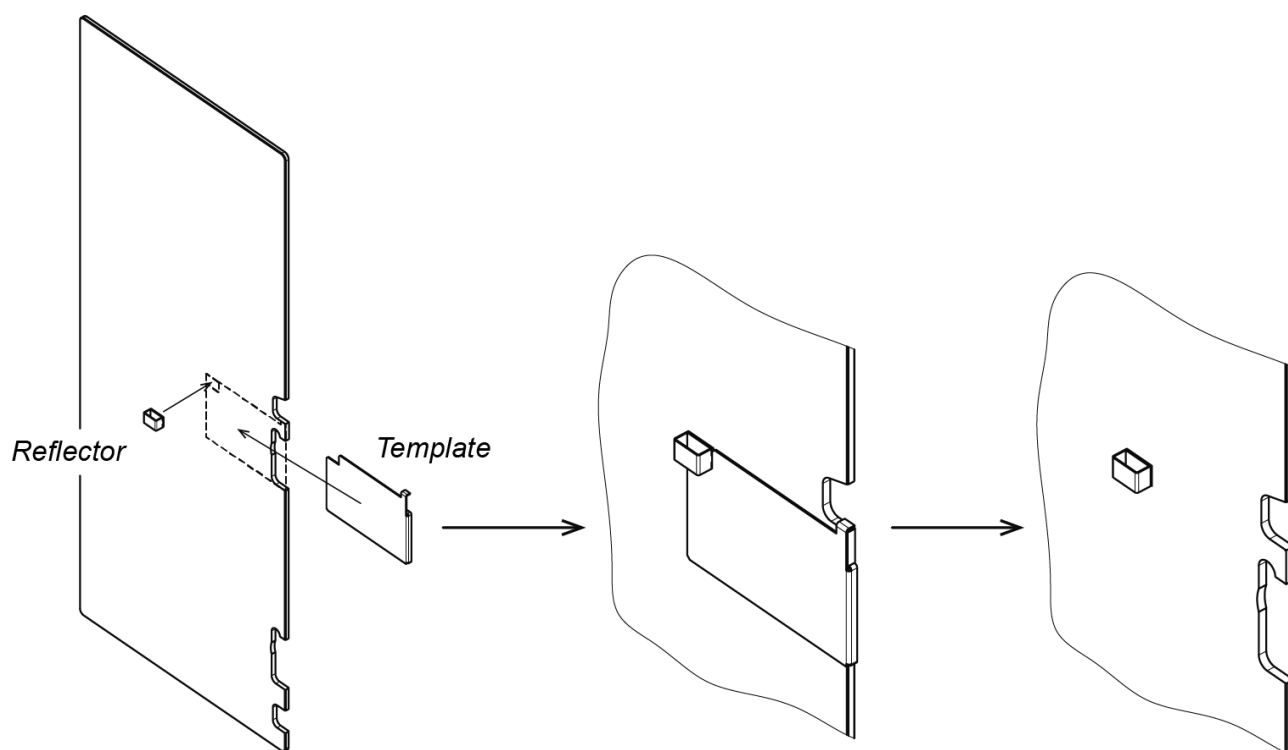


Figure 28. Installation of the reflector

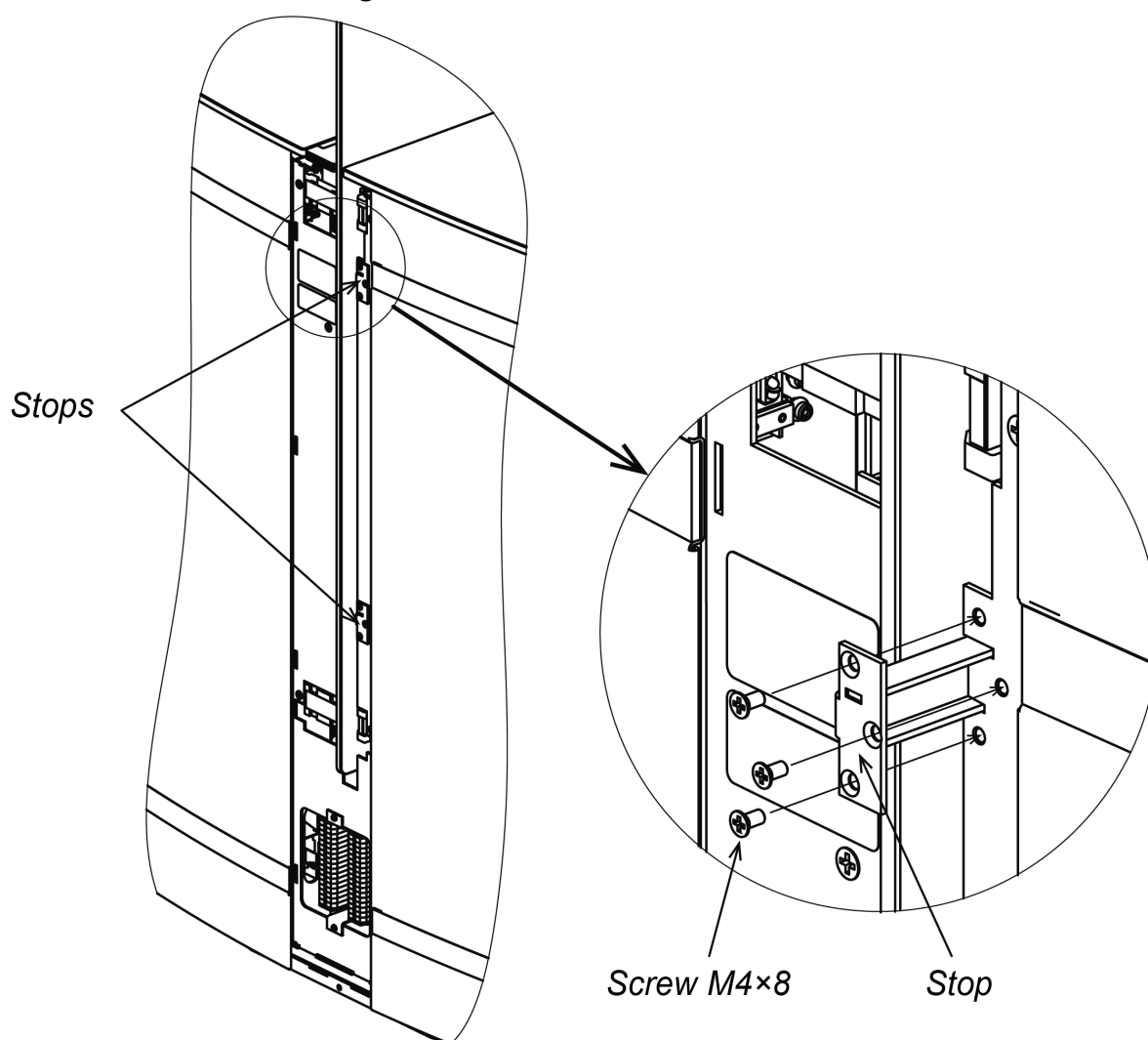


Figure 29. Installation of the sliding panels departure limiters

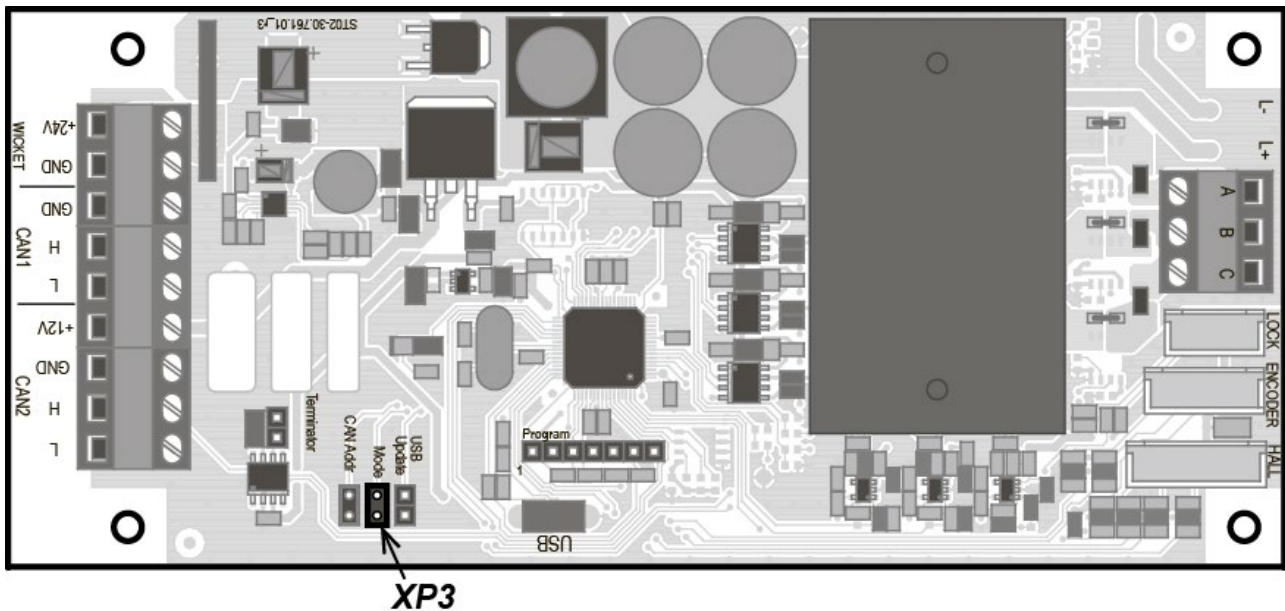


Figure 30. Motor drive board

9 OPERATION

Speed gate installation should be performed with the observance of safety rules described in Sect. 7.2.



Forbidden!

- To move objects through that are larger than a width of the opened passageway.
- Jerk and hit the components of the speed gate.
- Disassemble and adjust the assembly units that ensure the operation of the speed gate.
- Clean the speed gate by using substances that can cause mechanical damage to surfaces and corrosion of parts.

9.1 Switching on the speed gate



Attention!

Make sure that the passageway is free and nothing prevents the closing of the sliding panels before you turn the speed gate on.

Follow these steps:

1. Connect the power supply cable of the speed gate to the mains socket with the voltage and frequency specified in its datasheet.
2. Turn on the power supply of the speed gate. The speed gate sliding panels are automatically brought to the initial position.
3. In the pulse control mode, the command *"Passage denial"* is automatically sent, in the potential – *"Both directions are locked"* (see Table 5 and Table 6) The speed gate is ready for operation.

9.2 Pulse control mode

Issuing of control commands from the RC-panel and its indication on the speed gate sections is carried out in accordance with Table 5. The directions of the passage are independent of each other, i.e. the command sent to one direction does not change the state of the opposite direction.

The symbols of the RC-panel buttons and lights are shown in Fig. 7. Herewith:

- Speed gate monitors the location of the user in the passageway area after the command *"Single passage in selected direction"* has been sent. The speed gate will automatically switch to the *"Passage denial"* state after the passage is finished.

- If the passage has not been completed or if another command has not been sent after the *"Single passage in the selected direction"* command, then the speed gate will automatically switch to the *"Passage denial"* state after the **Holding time in the unlocked state** (by default set to 8 seconds).
- After the *"Single passage in selected direction"* command is sent, and if the passage has not been completed yet, resending of the same command for this direction will reactivate the **Holding time in the unlocked state** parameter.
- The speed gate will ignore *"Free passage"* command sent to any direction if *"Single passage in selected direction"* command has been already sent.
- Only *"Passage denial"* or *"Single passage in selected direction"* sent to the opposite direction, could be sent after *"Free passage in selected direction"* command, all other commands will be ignored.

Table 5. Pulse control mode (Pulse switch in ON position)

Command	Actions by the RC-panel operator ¹	Indication		Speed gate status	
		RC-panel	Indication blocks	Normally closed mode	Normally open mode
<i>"Passage denial"</i>	STOP button	The red <i>"Stop"</i> light is on	The red cross for both directions	Sliding panels are closed	The sliding panels are opened and close during passage attempt.
<i>"Single passage in selected direction"</i>	Pressing of the LEFT button or RIGHT	Red <i>"Stop"</i> indicator and green for the specified direction <i>"Left"</i> or <i>"Right"</i> are on»	Green arrow for a specified direction, red cross for another direction	The sliding panels open for a single passage in the specified direction and close after the passage	The sliding panels open for a single passage in the specified direction and remain opened after the passage
<i>"Free passage in the specified direction"</i>	Press of the two buttons simultaneously: STOP and LEFT or STOP and RIGHT	The green indicator of the set direction <i>"Left"</i> or <i>"Right"</i> is on»	Green arrow for a specified direction, red cross for another direction	The sliding panels are opened for free passage in the specified direction until a new command is given	
<i>«Free Passage»</i>	Pressing all three buttons simultaneously: LEFT , RIGHT and STOP	Two green indicators <i>"Left"</i> and <i>"Right"</i> are lit at the same time»	Green arrow for both directions	The sliding panels are opened for free passage in both directions until a new command is given	

9.3 Potential control mode

Issuing of control commands and its indication is carried out in accordance with Table 6. The directions of the passage are independent of each other, i.e. the command sent to one direction does not change the state of the opposite direction.

¹ Control of the turnstile with the WRC-device is similar to the control from the RC-panel. The buttons on the RC-panel of the WRC device perform the same functions as the RC-panel buttons.

Table 6. Potential control mode (Pulse switch is in OFF position)

Commands	It is necessary to ensure	Indication		Speed gate status	
		RC-panel	Indication blocks	Normally closed mode	Normally open mode
<i>"Both directions blocked»</i>	A high level at <i>Unlock A</i> and <i>Unlock B</i> contacts (or a low level on the <i>Stop</i> contact)	The red <i>"Stop"</i> light is on	The red cross for both directions	Sliding panels are closed	The sliding panels are opened and close during passage attempt.
<i>"Direction is opened»</i>	A low level at the contact of a specified direction. A high level at the rest of the contacts.	The green indicator of the set direction <i>"Left"</i> or <i>"Right"</i> is on	Green arrow for a specified direction, red cross for another direction	The sliding panels are opened for the passage in the specified direction	
<i>"Both directions are opened»</i>	A low level at <i>Unlock A</i> and <i>Unlock B</i> contacts. A high level at the <i>Stop</i> contact	Two green indicators <i>"Left"</i> and <i>"Right"</i> are lit at the same time»	Green arrow for both directions	The sliding panels are opened for the passage in both directions	

9.4 Actions in case of emergency

9.4.1 "Alarm" mode

In case when an obstacle prevents the free closing of the speed gate sliding panels, the speed gate will automatically switch to the *"Alarm"* mode. The mode is designed to prevent the failure of the speed gate motor drive due to overheating.

In case when an obstacle prevents the closing of the sliding panel, three attempts to close sliding panels at intervals of 3 seconds will be made. If the obstacle is not removed, then the speed gate will switch to the *"Alarm"* mode. In the *"Alarm"* mode, the speed gate sliding panels can be moved apart manually, which allows you to easily remove the obstacle from the passageway. At the same time, all three indicators of the RC-panel will flash and a continuous signal will sound.

Deactivation of the *"Alarm"* mode will be done automatically when the obstacle is removed and the speed gate passageway is free.

9.4.2 "Fire Alarm" mode

In case of dangerous situations at the site, the speed gate passageway can be used as an additional emergency exit.

It is possible to switch the speed gate to *Fire Alarm* mode by the emergency passage opening device (fire alarm device, emergency buttons, etc.). In this mode, if the speed gate sliding panels have been closed, then they will open and remain in this state in all operating modes for free passage in both directions, herewith the green indicators of passage granting will flash simultaneously in both directions, the control commands from other devices and SOFTWARE will be ignored (see section 5.3.2).

Also, the speed gate sliding panels can be moved apart manually (not blocked) when the power supply is removed.



Attention!

Safety evacuation exits are used for emergency evacuation of people from the territory of the enterprise in case of fire, natural disasters and other extremal situations. For example, **BH02** anti-panic rotary section of the railing system can serve as such exit.

10 MAINTENANCE

Maintenance of the speed gate is carried out only by the manufacturer or **PERCo** service centers.

It is recommended to use liquid non-abrasive cleaners that contain ammonia for cleaning the speed gate sections and sliding panels from dirt.

11 TRANSPORTATION AND STORAGE

Speed gate storage is allowed in dry indoor facilities at ambient air temperature from -40°C to +50°C at relative air humidity 80% at +15°C. There should be no pair of acids, alkalis, and corrosive gases in the storage room.

Speed gate should be transported in the original package and in closed freight containers or other closed type cargo transport units (in rail wagons, containers, closed cars, holds, airplanes, etc.).

It is not allowed to stack boxes during transportation and storage.

After transportation or storage at temperatures below zero or at high air humidity, the speed gate it must be kept in the package for at least 24 hours in climatic conditions corresponding to the operating conditions before installation procedures.

Appendix 1. Operation algorithm in pulse control mode

"Passage denial" (closed 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 directions close upon receiving this command.

"Single passage in direction A" (opened for passage of one person in direction A) – active front at *"Unlock A"* contact, while there is a high level at *"Stop"* and *"Unlock B"* contact. This command opens direction A either for 8 seconds, or until completion of the passage in this direction, or until receiving the *"Passage denial"* command, and B direction remains unchanged. The command is ignored if A direction was in the *"Free passage"* mode at the time it was received.

"Single passage in direction B" (opened for passage of one person in direction B) – the active front at the *Unlock B* contact at a high level on the *Stop*, *Unlock A* contacts. This command opens direction A either for 8 seconds, or until completion of the passage in this direction or until receiving the *"Passage denial"* command, and A direction remains unchanged. The command is ignored if B direction was in the *"Free passage"* mode at the time it was received.

"Free passage in direction A" (opened for free passage in direction A) – an active front at the *Unlock A* contact, low level on the *Stop* contact and the high level on *Unlock B* contact, or active front is at *Stop* contact while a low level is at *Unlock A* and high level at *Unlock B*. This command opens direction A until *"Passage denial"* command is received, and direction B remains unchanged.

"Free passage in direction B" (opened for free passage in direction B) – an active front at the *Unlock B* contact, low level on the *Stop* contact and the high level on *Unlock A* contact, or active front is at *Stop* contact while a low level is at *Unlock B* and high level at *Unlock A*. This command opens direction B until *"Passage denial"* command is received, and direction A remains unchanged.

"Free passage" (opened for free passage in both directions) active front is at *Unlock A* contact, low level at *Unlock B*, *Stop* contacts, or active front is at *Unlock B* contact, a low level at *Unlock A*, *Stop* contacts, or active front is at *Stop* contact while a low level at *Unlock A*, *Unlock B* contacts. This command opens both directions until the *"Passage denial"* command is received.

Appendix 2. Operation algorithm in potential control mode

"Both directions are locked" (closed for entry and exit) – high level at *Unlock A*, *Unlock B* contacts or low level at the *"Stop"* contact. Both directions close upon receiving this command.

"Direction A is opened" (opened for passage in A direction) – low level at *"Unlock A"* contact, while there is a high level at *"Stop"* and *"Unlock B"* contacts. This command opens direction A until the low level signal is removed from A contact, or until *"Both directions are closed"* command is received, and direction B remains unchanged.

"Direction B is opened" (opened for passage in B direction) – low level at *"Unlock B"* contact, while there is a high level at *"Stop"* and *"Unlock B"* contacts. This command opens direction B until the low level signal is removed from B contact, or until *"Both directions are closed"* command is received, and direction A remains unchanged.

"Both directions are opened" (opened for passage in both directions) – a low level at *Unlock A* and *Unlock B* contacts, and a high level at the *Stop* contact. This command opens both directions until the low level signal is removed from one of the A (B) contacts, or until the *"Both directions are closed"* command is received.

PERCo

Polytechnicheskaya str., 4, block 2
194021, Saint Petersburg
Russia

Tel: +7 812 247 04 64

**E-mail: export@perco.com
support@perco.com**

www.perco.com



www.perco.com