GROUP OF COMPANIES

"TiSO-PRODUCTION" LTD

WAIST-HIGH TURNSTILES

SWEEPER-BM of swing lane of Speed Gate series

OPERATION AND INSTALLATION MANUAL

AUIA.206-06 rev.1.2.1

2023

UKRAINE

CONTENTS

INTRODUCTION

This Operation Manual (hereinafter referred to as OM) covers the servo-operated "Sweeper-BM" type waist-high turnstile (hereinafter referred to as the "turnstile"). The Operation Manual contains information about design, specifications, installation for proper operation and maintenance of the turnstile.

This Operation Manual is prepared in compliance with the specification requirements TU U 28.9-32421280-005:2018.

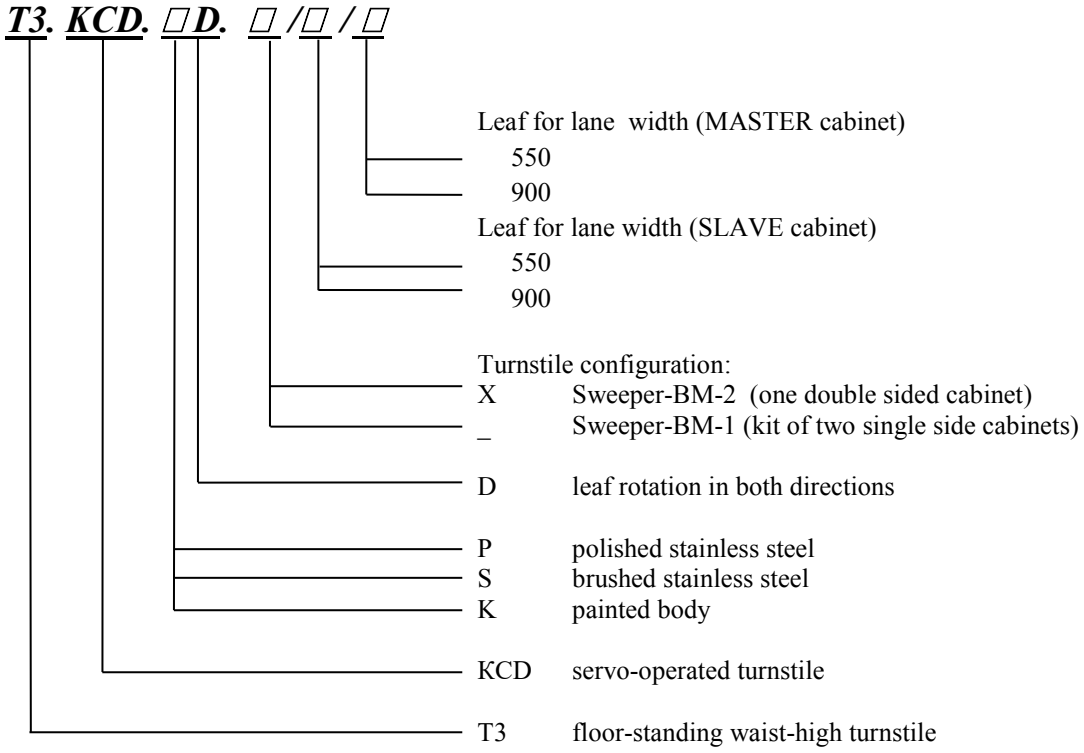
The turnstile shall be serviced only by the qualified staff having the relevant class of permit to work with electrical facilities with voltage up to 1000V and scrutinizing this Operation Manual, obtaining safety instructions and trained for operation and maintenance of the turnstile.

Reliability and durability of the turnstile operation are provided with observation of modes and conditions of transportation, storage, installation and operation. So, fulfillment of all requirements specified in this document is mandatory.

The turnstile "Sweeper-BM" can be installed both singly and in line. The single turnstile includes two cabinets (left-hand and right-hand), each of which has one glass leaf in the form of swing leaf.

The turnstile group is provided by installation one more or a number of additional cabinets equipped with swing glass leaves on both sides reducing costs and saving space.

Depending on the turnstile purpose and design features, the following pattern of reference designation is accepted:



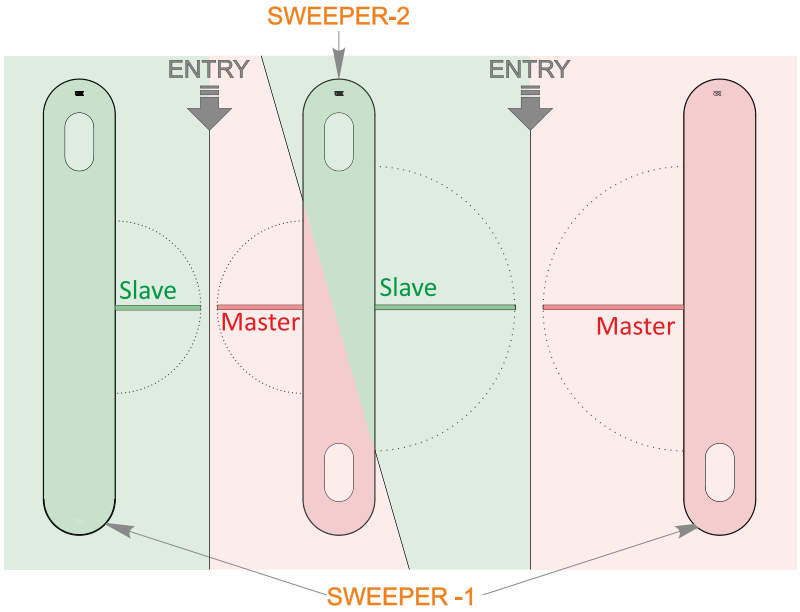


Fig. 1 – Definition of the turnstile component description

Turnstile " Sweeper-BM-1" - set of two single side cabinets Master and Slave: - identification order code ***T3.KCD.PD _/900 / 550***
Turnstile "Sweeper-BM-2" - one double sided cabinet Master/Slave: - identification order code ***T3.KCD.PD. X / 550 / 900***

Name		*Designation*	*Code*
One side cabinet Master	SWEEPER-BM-1.1	AUIA.206-06.1	T3.KCD.XD
One side cabinet Slave	SWEEPER-BM-1.2	AUIA.206-06.1	T3.KCD.XD
Double side cabinet Master/Slave	SWEEPER-BM-2	AUIA.206-06.2	T3.KCD.XD.X

Due to regular improvement of the product its design can be modified without degradation of the product features and quality not covered by this Operation Manual.

WARNINGS TO THE CUSTOMER ON SAFE OPERATION OF THE TURNSTILE

These warnings are designed for ensuring of safety during operation of the turnstile to prevent violation of safety characteristics by improper installation or operation. These warnings are aimed at drawing attention of the customer to safety problems.

GENERAL WARNINGS

The Operation Manual is an integral part of the product and it shall be handed over to the customer. The OM shall be kept for later use and consulted for clarifications if required. If the turnstile is resold, handed over to another owner or transported to another place, make sure that the OM is enclosed to the turnstile to be used by new owner and/or maintenance staff during installation and/or operation.

Safety measures and requirements specified in this in this OM must be observed:

– the turnstile must be connected to ground loop prior to operation;

– the turnstile should be connected to AC network with parameters specified in paragraph 1.2 "Specifications";

– inspection, adjustment and repair should be performed only after the turnstile is deenergized

After purchasing of the turnstile it should be unpacked and its integrity should be checked. In case of doubt in integrity of the turnstile it should not be used and the customer should refer to the supplier or to the manufacturer.

Packing accessories (wooden pallet, nails, clips, polyethylene bags, cardboard etc.) as potential sources of hazard must be removed to unacceptable place prior to proper use of the turnstile.

As electric shock protection device the turnstile is related to 01 protection class according to GOST (State Standard) 12.2.007.0-75 and is not intended for operation in explosive and fire- hazardous areas by the "Rules for design of electrical installations".

Using of the turnstile for unintended purpose, improper installation, nonobservance of conditions of transportation, storage, installation and operation, specified by this OM, may result in damage to people, animals or property for which the manufacturer is not responsible..

1. DESCRIPTION AND OPERATION

1.1 General Information and Purpose

1.1.1 Turnstile purpose:

The servo-operated turnstile is designed for pedestrian movement control at access points of industrial enterprises, banks, stadiums, administrative facilities etc. controlled by access control system (from proximity card readers) or manually (from manual control panel).

The turnstile traffic flow capacity without personal identification is at least 30 persons per minute in one direction

1.1.2 The turnstile dimensions and weight correspond to the values specified in Table 1.

Dimensions of turnstile group - *Table 1*

Designation of turnstile modification type	*Access way width*	*Dimensions, mm*			*Max. weight, kg*
		Height (H)	*Width of set for one lane (W)*	*Length (L)*	
Sweeper-BM-1 550	550	1010	950 (958*)	1310 (1318*)	163
Sweeper-BM-1 900	900		1300 (1308*)		173

** Overall dimension for the turnstile with glass top lid.*

** When the turnstile with more than two lanes is ordered:

$$W_{total} = 750 \cdot s + 1100 \cdot w + b$$

where s – number of 550 mm lanes ‘standard’;

w – number of 900 mm lanes ‘wide’;

b - lid width - 200 mm (208 mm for solid glass top lid);

Example of calculation of size W_{total} for two lanes turnstile = 750 · 1 + 1100 · 1 + 200 = 2050 mm (See Fig.2)

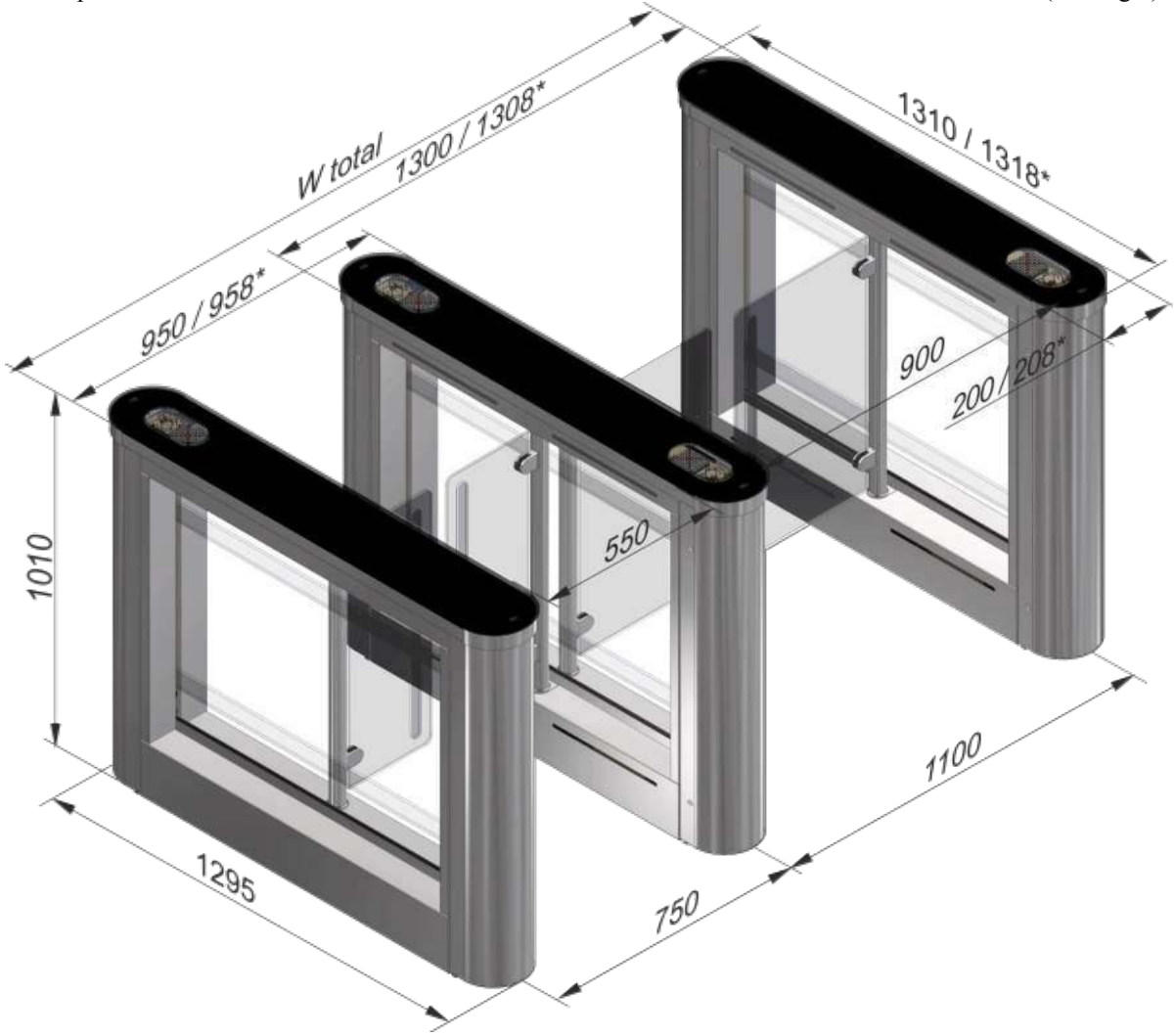


Fig. 2 – Dimensions of turnstile group

1.1.3 The turnstile component identification codes are specified in Table 2.

Overall dimensions of cabinet without leaves - *Table 2*

Description of the turnstile component	Order code	Dimensions, mm			Max. weight, kg
		Height	*Width*	*Length*	
One side cabinet Master SWEEPER-BM-1.1 One side cabinet Slave SWEEPER-BM-1.2	T3.KCD.XD	1010	200 (208*)	1310 (1318*)	71 70
Double side cabinet Master/Slave Sweeper-BM-2	T3.KCD.XD.X				90

** Overall dimension for the turnstile with glass top*

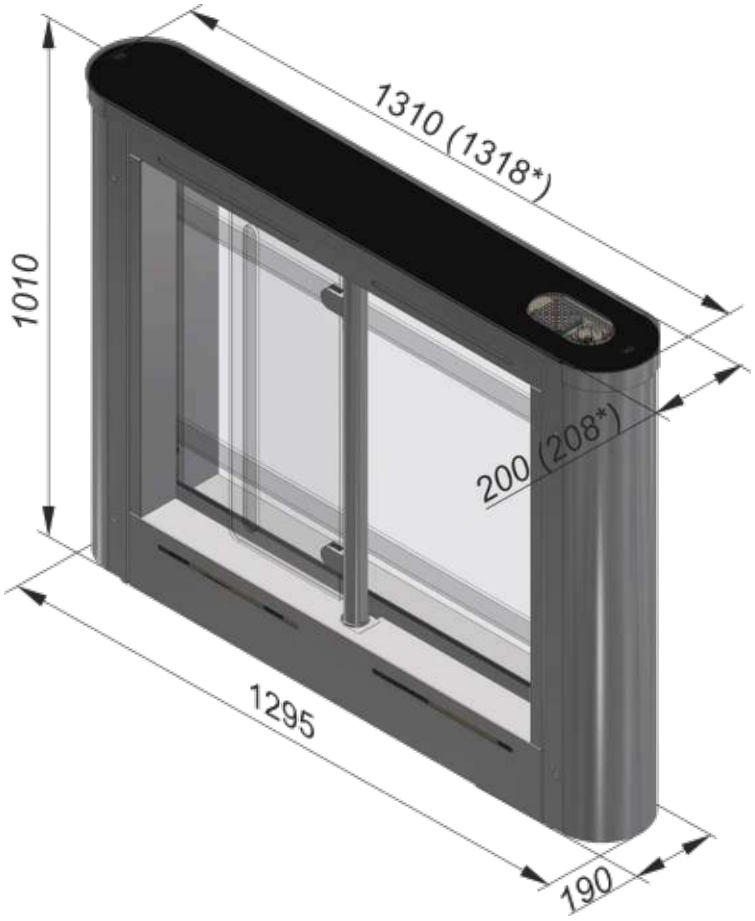


Fig. 3 – Overall dimensions of the turnstile cabinet

1.1.4 The operation condition parameters according to GOST 15150-69 are specified in Table 3 *For climatic modification NF4*

Table 3

Operation conditions	*Parameter value*
Ambient air temperature	+1°C to +40°C
Relative air humidity	80% at +20ºC
Ambient air allowable pressure	84 to 106,7 kPa
Transportation temperature range	- 40°C to + 50°C
Storage temperature range	+ 5 to + 40°C
Structural design category	L3
Altitude above sea level	up to 2000m
Environment	Explosion-proof, does not contain current-conducting dust, aggressive gases and vapours in concentration destroying isolation and metals, disturbing normal operation of the equipment installed in turnstiles
Installation site	In enclosed spaces in the absence of direct impact of precipitations and solar radiation
Operating position	Vertical, deviation from vertical position no more than 1º to any side is allowed

1.2 Specifications

Key parameters of the turnstile are specified in Table 4.

Table 4

Parameter description	*Parameter value*	
Maximum lane width	550 mm	900 mm
Traffic flow capacity in free access mode, at least	40 *man/min.*	30 *man/min.*
Opening/closing time	0,6 *s*	0,3 *s*
Power supply voltage: – AC power supply (primary) – DC power supply (secondary)	 100 ÷ 240 *V* ~ 50/60 *Hz* 12 *V*	
Maximum power consumption	160 *W*	
Index of protection according to EN 60529	IP41	
Mechanism	MDrive® servo-driven (BLDC)	
Locking system	ToothLock®	
In case of power failure	fail-safe (gates can be opened manually)	
LED Light: - display showing access status - card reader area - glass partitions showing turnstile	DotLights® RFIDLights® EdgeLights®	
Reliability indices		
Mean time to repair (without delivery time of spare parts, tools and accessories)	– at most 6 hours;	
Mean time to failure	– at least 10 000 000 accesses	
Mean service life between overhauls	– at least 10 years	

1.3 Configuration and Scope of Delivery

1.3.1 The turnstile modification depends on the number of solid lanes:

1) For arrangement of single access way the turnstile "Sweeper-BM-1" is a set of two similar in design cabinets (Master and Slave) with one swing glass leaf (reference designation T3.KCD.XD);

2) For arrangement of two or more lanes the turnstile "Sweeper-BM-1" is a set of two one-leaf cabinets (reference designation T3.KCD.XD) (Fig.1 b) and one or more auxiliary cabinets "Sweeper-BM-2" (Master/Slave) with two swing leaves (reference designation T3.KCD.XD.X).

1.3.2 Design of the single "Sweeper-BM-1" type turnstile

The single turnstile "Sweeper-BM-1" (See Fig. 4) consists of two one-leaf cabinets.

The one-leaf cabinet body includes:

– frame;
– pivoted swing door with locks;
– top, side and bottom linings;
– decorative lid (countertop);
– glass partition;
– swing glass leaf;
– LED display.

Inside the auxiliary cabinet there are installed:

– two servomotors and lock solenoids;
– twenty access sensors;

The cabinet design provides a space for installation of proximity identification card reader *.

The cabinet has built-in components:

– controllers;
– power supply unit.

Optionally the cabinet can be completed with battery* (capacity 4 A•). The single turnstile control panel equipped with power supply unit, circuit breaker and battery* is installed only in the cabinet (Master) from the protected area side.

1.3.3 Design of the "Sweeper-BM-2" type turnstile

The turnstile is one or more auxiliary cabinets "Sweeper-BM-2" (Master/Slave) with two swing glass leaves (See Fig. 5). The number of auxiliary cabinets to be specified in the order. The turnstile "Sweeper-BM-2" is used within group of the turnstile "Sweeper-BM-1".

The auxiliary cabinet body includes

– frame;
– top, side and bottom linings;
– countertop (lid);

– glass partition;
– two swing glass leaves;
– two LED displays

Inside the auxiliary cabinet body there are installed:

– two gear motors and lock solenoids;
– twenty access sensors.

The cabinet design provides a space for installation of proximity identification card reader∗;
The auxiliary cabinet has built-in components:

– controllers;
– power supply unit.

Optionally the auxiliary cabinet can be completed with battery.

1.3.4 The turnstile material of manufacture

Housing designation and modification		*Coding*
Standard	brushed stainless steel AISI 304	T3.KCD.***S***D
Optional	brushed stainless steel AISI 316	T3.KCD.***S***D
	polished stainless steel AISI 304	T3.KCD.***P***D
	polished stainless steel AISI 316	
	carbon steel subject to painting RAL	T3.KCD.***K***D
Glass leaves designation		
	tempered glass (8 mm)	-
Top glass designation and modification		
	stainless steel top with glass inserts	-
	with solid glass top	-

1.3.5 Turnstile scope of delivery

The turnstile is delivered as a kit (set of cabinets depending on the number of lanes).
The turnstile is delivered by one or a number of packages (depending on the order).

1.4 Design and operation

1.4.1 Turnstile design (See *Fig. 7*)

The body of the turnstile cabinet is a frame (See *Fig. 4 or Fig. 5*) on which are mounted stainless steel top lining ***6,*** side lining *7*, bottom lining ***8***, pivoted door ***2*** and 8mm-tempered glass partition 9. A card reader lid 5 (lining material is specified by the order) is fixed on frame top.

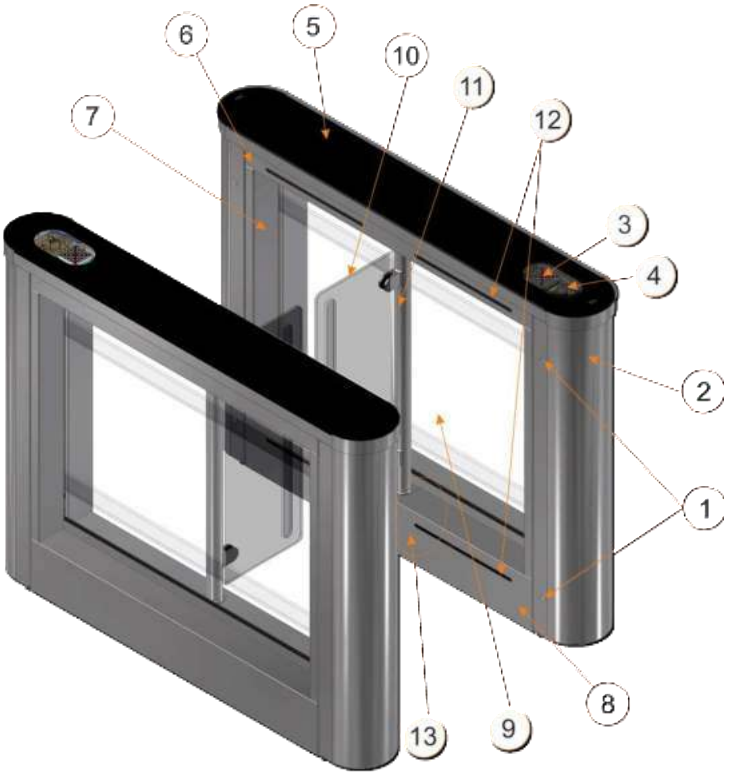
The turnstile status is displayed by LED display board ***3,*** installed in the frame. The lit blue LED *(Fig.6)* means initial state of the turnstile. In case of attempt of unauthorized access red LED starts blinking and audible signal is generated on control panel. When the command to open is received, LED is changed to green from the side of authorized access. If an attempt of unauthorized passage occurs when swing leaves ***10*** are opened, then the leaves will be closed, if there are no obstacles in their access zone.

Six infrared sensors ***12***, installed on top lining ***6***, and four infrared sensors in the turnstile bottom lining ***8*** from the access way side, are designed for detection of turnstile access, prevent closing of swing leaves ***10*** when a person is in close proximity to them and minimize the probability of being injured during passage through the turnstile.

The swing leaf ***10*** is made of 8 mm tempered glass and is fixed with glassholders of pivoting shaft ***11***. The swing is opened at 90° to either side depending on access direction. Each leaf is actuated by separate gear motor ***13***. Additional double sided cabinet "Sweeper-BM-2" is equipped with two gear motors ***13*** (one per each leaf), while cabinets of the turnstile "Sweeper-BM-1" have one gear motor for each cabinet.

In case of 230V power supply failure the turnstile leaves will be released and will remain in the position in which they were. To provide free access way the leaves to be swung aside manually. The turnstile operation will be maintained from battery (if it is installed) until it is discharged.

The cabinet operating mechanism is shown in *Figure 7*. The lock solenoid ***2*** provides reliable mechanical locking of swing leaf in closed position.

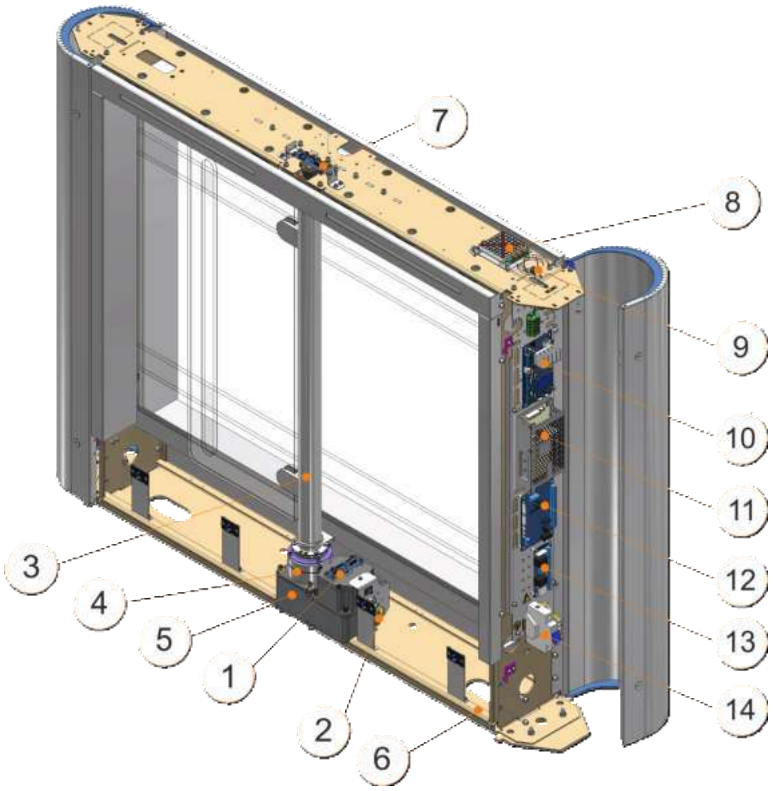


1 – locks;
2 – pivoted door;
3 – LED display (DotLights®);
4 – place for identification card reader with LED (RFIDLights®);
5 – top lid (solid glass top or stainless steel top with glass inserts);
6 – top lining (front and back);
7 – side lining (front and back);
8 – bottom lining (front and back);
9 – glass partition with LED (EdgeLights®);
10 – swing glass leaf;
11 – shaft with leaf's holder;
12 – IR access sensors;
13 – gear motor.

Fig. 4 – Design of single side cabinets type turnstile "Sweeper-BM-1" T3.KCD.XD

Fig. 5 – Design of the "Sweeper-BM-2" type turnstile T3.KCD.XD.X

1.4.2 General appearance of the turnstile operating mechanism and control desk



1 – motor shaft position sensor;
2 – boost converter PCB.203.001;
3 – shaft with leaf's holder;
4 – electromagnetic tooth clutch;
5 – BMDrive® gear motor ;
6 – frame;
7 – leaf position sensor ;
8 – LED display (DotLights®);
9 – place for identification card reader with LED (RFIDLights ®);
10 – motor controller AUIA.401.00.00-01;
11 – power supply unit;
12 – main controller AUIA.206.21.20.00;
13 – link board for Master and Slave;
14 - circuit breaker;

Fig. 6 – General appearance and design of "Sweeper-BM-1" turnstile mechanism (Master cabinet)

1.4.3 Principle of operation

1) Turnstile status indication

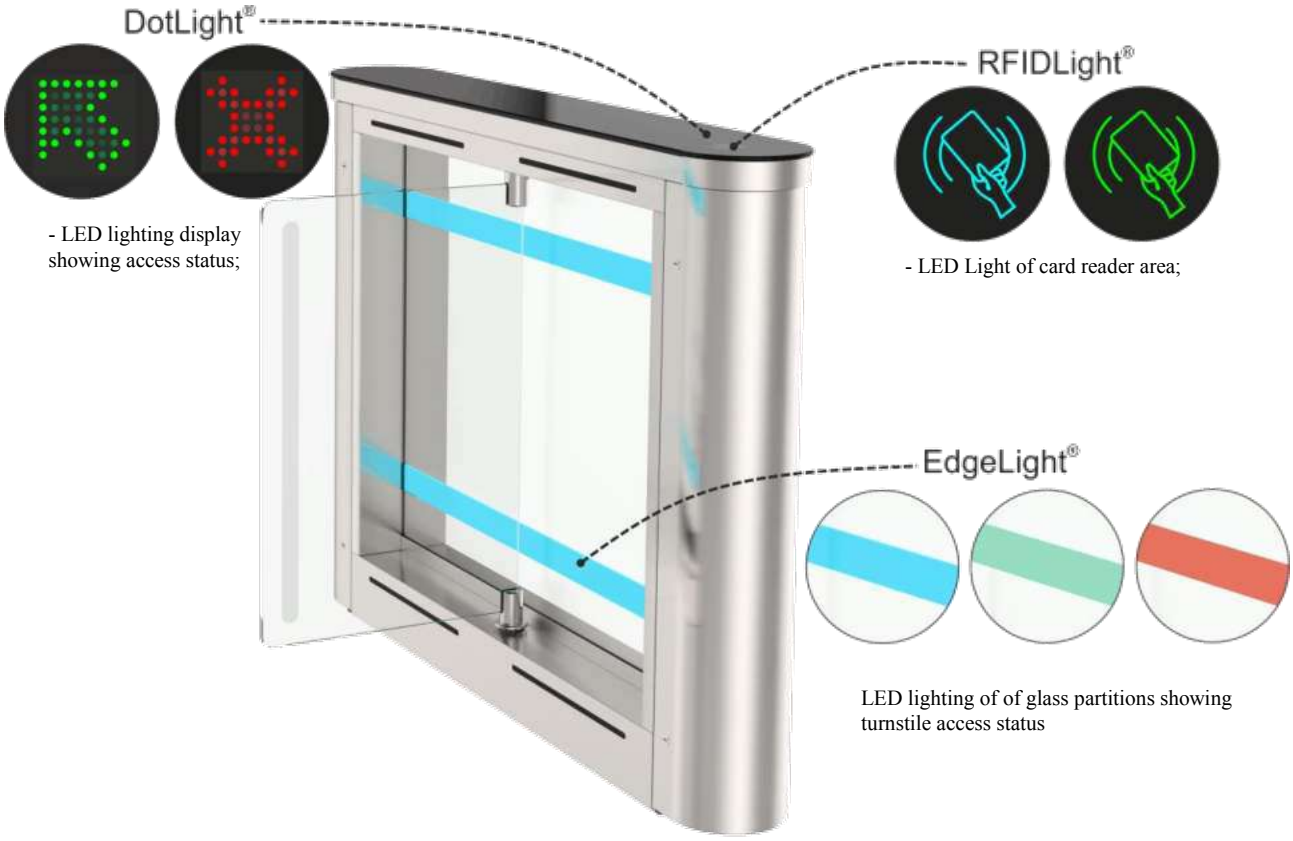


Fig.7 – Light indication of the turnstile status

2) Access cycle:

1. In the initial state the turnstile glass leaves are located perpendicular to the body blocking the access.

2. The turnstile is opened for access in the direction "A" **or** "B" after the appropriate command from ACS or control panel is issued.

3. Green arrow is lit on LED display and glass leaves go fully to slots, i.e. they open. A pedestrian is able to access through the turnstile freely.

4. After pedestrian exits from control area, the "closed" mode is set until next access. Blue LED is lit. Leaves are reliably closed preventing attempts of unauthorized access.

More detailed description of the turnstile operation modes is given in section 1.5 "Description and operation of controller as an integral component of the turnstile".

12V DC power voltage is provided by power supply unit.

In case of mains power supply failure, the turnstile is automatically switched to power supply from 12V, 4A•h battery (optional), which ensures the turnstile's operation within 2 hours.

The turnstile wiring and connection diagrams are shown in Annex C.

Fig.8 - LED display status lights

1.5 Description and operation of controlers as integral components of the turnstile

1.5.1 Turnstile controller AUIA.206.21.20.00

1.5.1.1 Appearance of controller AUIA.206.21.20.00 is shown in *Figure* 9.

1.5.1.2 Description of operation

The controller provides algorithm of operation of the whole turnstile. It is assembled on the card from foil-clad textile laminate of 120 x 80 mm size, on which electronic components and terminals for connection to other turnstile units as well as for connection to control peripherals (ACS, control desk etc.) are installed.

The controller initiates signal for 10 infrared transmitters and receives signal from 10 infrared receivers that enables to determine human (or object) presence in the turnstile access area with high probability. Furthermore, the controller controls light and sound indication, receives commands from control desk using interface RS-485, receives commands and initiates report signals for ACS via signal inputs and outputs as well as controls operation of motor controllers (AUIA.401.00.00-01). The controller and therefore the turnstile can be in the following modes.

- «INITIAL STATE».
- «SINGLE ACCESS IN THE DIRECTION A».
- «SINGLE ACCESS IN THE DIRECTION B».
- «SINGLE ACCESS IN BOTH DIRECTIONS».
- «FREE ACCESS IN THE DIRECTION A».
- «FREE ACCESS IN THE DIRECTION B».
- «FREE ACCESS IN BOTH DIRECTIONS».
- «LOCKING OF ACCESS IN THE DIRECTION A».
- «LOCKING OF ACCESS IN THE DIRECTION B».
- «LOCKING OF ACCESS IN BOTH DIRECTIONS».
- «ALARM».

«**INITIAL STATE**»

The turnstile is in this mode during energization and after completion of the turnstile access, if during access the mode is not changed to "LOCKING", "FREE" or "ALARM". In this mode red LED is constantly lit on both LED boards, sound indication is OFF, access is blocked by leaves.

«**SINGLE ACCESS**»

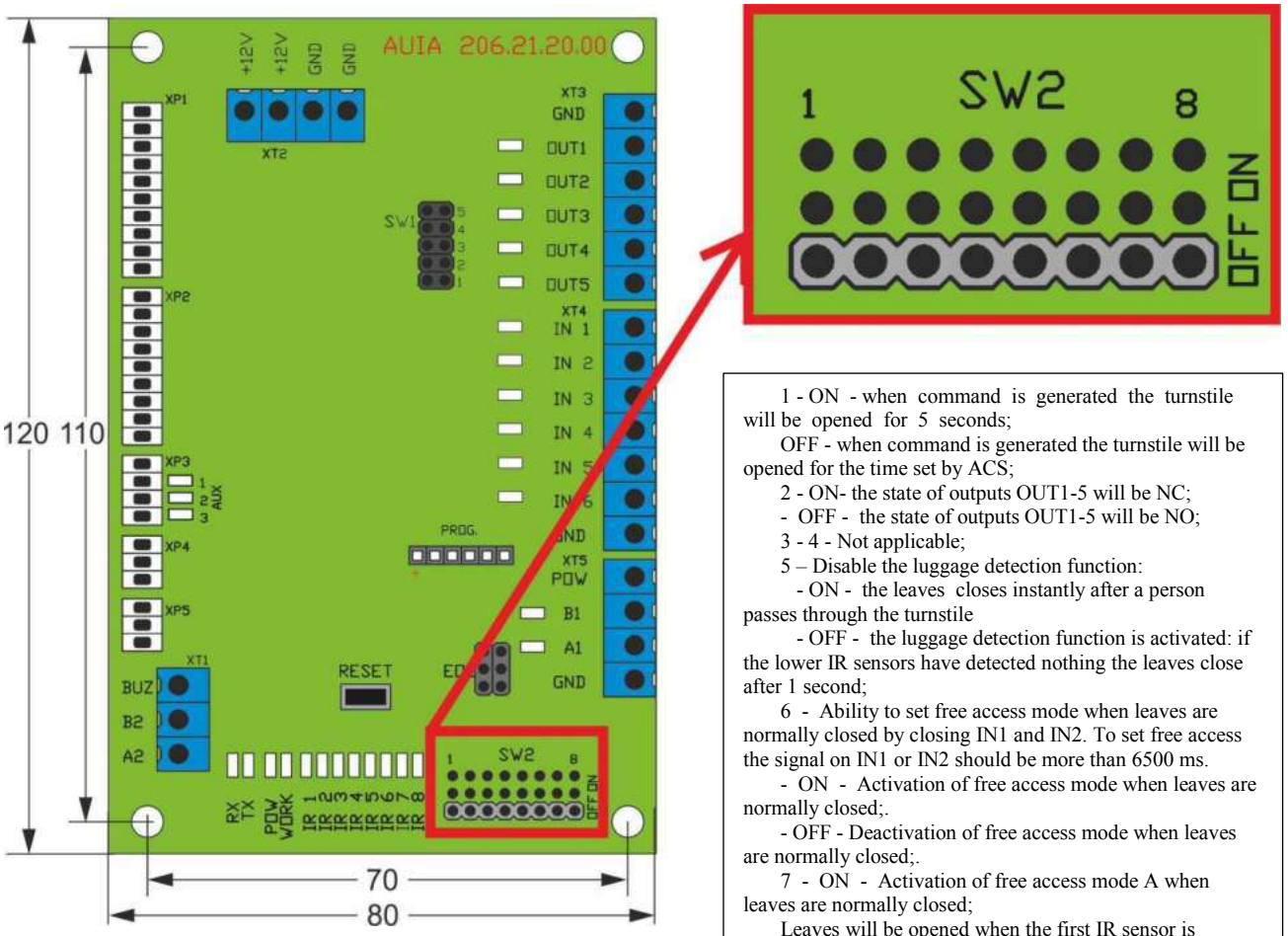
The turnstile goes to this mode when command "SINGLE ACCESS A/B" comes from control desk via interface RS-485 or when signal inputs "INP1" ("ACCESS A TO BE OPENED") or/and "INP5" ("ACCESS B TO BE OPENED") are closed on common wire (terminal "GND").

In this case if command comes via interface RS-485, the access start waiting time is 5 sec. and when signal inputs are short circuited the turnstile will be waiting for access start while input is closed. Green arrow is lit on LED display from the side of permitted access and red cross is lit from the side of denied access. Leaves are hidden in lining making access free. Pedestrian is able to access through the turnstile. If access start time is up and access is not started (the first IR barrier in the direction of movement was not blocked), the turnstile returns to "INITIAL STATE". If within the above time period access is started, controller generates the signal "ACCESS IS OCCUPIED" (outputs "OUT1" or/and "OUT2") and starts tracing position and direction of pedestrian movement in the turnstile access way, analyzing 6 IR barriers. As soon as pedestrian is behind swing leaves they are closed, the controller generates the signal "DETECTION OF ACCESS" of 0,3 second duration (outputs "OUT3" or "OUT4") and LED display is switched from green to red. After the pedestrian turnstile access the controller deenergizes the signal "ACCESS IS OCCUPIED" and returns to "INITIAL STATE".

«**FREE ACCESS**»

The turnstile goes to this mode either upon command "FREE ACCESS A/B" arrived via interface RS-485 from control desk or if during "SINGLE ACCESS" initiated by signal on input "INP1" ("ACCESS A TO BE OPENED") or/and "INP2" ("ACCESS B TO BE OPENED") at the end of 0,3 sec. after the signal "DETECTION OF ACCESS A" or "DETECTION OF ACCESS B" is removed by controller, the signal on the relevant input "INP1" or "INP2" was not removed. In this mode swing leaves are constantly turned in the direction of free access, green arrow is blinking on LED display from the side of permitted access. Thus every turnstile access is traced and the signal "DETECTION OF ACCESS" of 0,3 second duration is generated to the relevant output («OUT3» or "OUT4").

In this state the turnstile will be until arrival of command "CANCELLATION OF FREE ACCESS" via interface RS-485 or until removal of signals from "INP1" or/and "INP2" depending on the cause of going to the free access mode.



1 - ON - when command is generated the turnstile will be opened for 5 seconds;
OFF - when command is generated the turnstile will be opened for the time set by ACS;
2 - ON- the state of outputs OUT1-5 will be NC;
- OFF - the state of outputs OUT1-5 will be NO;
3 - 4 - Not applicable;
5 – Disable the luggage detection function:
- ON - the leaves closes instantly after a person passes through the turnstile
- OFF - the luggage detection function is activated: if the lower IR sensors have detected nothing the leaves close after 1 second;
6 - Ability to set free access mode when leaves are normally closed by closing IN1 and IN2. To set free access the signal on IN1 or IN2 should be more than 6500 ms.
- ON - Activation of free access mode when leaves are normally closed;.
- OFF - Deactivation of free access mode when leaves are normally closed;.
7 - ON - Activation of free access mode A when leaves are normally closed;
Leaves will be opened when the first IR sensor is crossed;
- OFF - Deactivation of free access mode A when leaves are normally closed;
Leaves will be opened all the time;
8 - ON - Activation of free access mode B when leaves are normally closed;
Leaves will be opened when the first IR sensor is crossed;
- OFF - Deactivation of free access mode B when leaves are normally closed;
Leaves will be opened all the time;

Fig. 9 – Appearance of controller AUIA.206.21.20.00

« **LOCKING OF ACCESS** »

The turnstile goes to this mode only upon command "LOCKING OF ACCESS A/B" arrived via interface RS-485 from control desk. In this case red LED is blinking from the side of locked access, leaves are in closed state (if the turnstile is not opened for free or single access from opposite side), controller does not respond to signals of inputs "INP1" ("ACCESS A TO BE OPENED") or/and «INP2» ("ACCESS B TO BE OPENED) respectively.

The lock mode prevails over single and free access mode. It means that access can be locked at any time, thus, if within the panel closing area there is no any obstacle, then they will be closed.

The controller will be in this mode until arrival of command "CANCELLATION OF ACCESS LOCKING A/B" via interface RS-485 from control desk

« **ALARM** »

The turnstile goes to this mode from any above mentioned mode in case of unauthorized access attempts. Meanwhile red LED is frequently blinking (4 times per second), siren alarm is generated on the turnstile and control panel and output "OUT5" is activated on the controller board. If the turnstile was opened, then swing leaves would be closed if there were no obstacles in the closing area. The turnstile will return to the mode preceding the "ALARM" mode as soon as causes of this mode disappear. In this case the output "OUT5" will go to passive state, siren alarms on control desk will be off and panels and light indication will be set according to the current mode.

The purpose of the controller contacts intended for connection to peripherals is specified in Table 5.

Table 5

Connector/ Contact No	*Designation*	*Direction*	*Purpose*	*Signal parameters and description*
1	*2*	*3*	*4*	*5*
XT4/1	INP1 ("TO BE OPENED A")	ENTRY	"TO BE OPENED FOR SINGLE/FREE ACCESS"	1) logical «0» (0 ÷ 2,2) V; 2) logical «1» (3 ÷ 5) V; 3) active level of signal (factory setting) logical «0» 4) voltage on open input < 5 V
XT4/2	INP2 («ОТКРЫТЬ В»)	ENTRY		
XT4/3	INP3 («PANIC»)	ENTRY	"SWITCHING TO PANIC STATE" command	
XT4/4	INP4	ENTRY	Not applicable	
XT4/5	INP5	ENTRY		
XT4/6	INP6	ENTRY		
XT4/7	GND		COMMON WIRE	
XT3/1	GND		COMMON WIRE	
XT3/2	OUT1 («ACCESS A IS OCCUPIED»)	EXIT	Signal is generated from the moment of blocking of the first IR barrier in the direction of movement and is removed after cancellation of the latter	1) type of output – open collector; 2) peak voltage on privacy key 55V; 3) peak current of public key 100mA; 4) resistance of public key (5 ÷7) Ohm; 5) active level of signal (Factory setting) – logical «0» (connection on GND)
XT3/3	OUT2 («ACCESS B IS OCCUPIED»)	EXIT		
XT3/4	OUT3 («DETECTION OF ACCESS A»)	EXIT	Signal appears during barring of the second last IR barrier and continues 0,2 sec.	
XT3/5	OUT4 («DETECTION OF ACCESS B»)	EXIT		
XT3/6	OUT5 («ALARM»)	EXIT	Output is active in case of unauthorized access attempt	
XT5/1	POW		«+» power supply	1) Power supply voltage 12V; 2) Consumption current < 150 mA
XT5/2	B1		It is used for data transmission via serial port. It is used for connection of control desk.	Interface RS-485
XT5/3	A1			Interface RS-485
XT5/4	GND		COMMON WIRE	
XT1/1	BUZ		Output for connection of audible alarm. The output is active in case of unauthorized access	1) type of output – open collector; 2) peak voltage on privacy key 60V; 3) peak current of public key 250 mA; 4) resistance of public key (0,48÷ 640) Ohm; 5) active level of signal (Factory setting) – logical «0» (connection on GND)
XT1/2	B2		It is used for data transmission via serial port.	Interface RS-485
XT1/3	A2			Interface RS-485
XT2/1	+ 12V		«+» per supply (controller energization)	1) Power supply voltage 12V; 2) Consumption < 150 mA
XT2/2	+ 12V			
XT2/3	GND (common)		«-» power supply (common wire)	
XT2/4	GND (common)			

1.5.2 Motor controller AUIA.401.00.00-01

1.5.2.1. Description of motor controller AUIA.401.00.00-01

The controller AUIA.401.00.00-01 is designed to control BMDrive® gear motors, which drives the turnstile leaves in motion. At each passage of turnstile installed pair of controllers AUIA.401.00.00-01: the first controller drive the leaf in the Master cabinet, the second controller drive leaf in the Slave cabinet.

BMDrive® gear motors control are performed based on the signals coming from leaf position sensor «XP6», motor magnet sensor «XP3», hall sensors "XP12" built into the gear motors, as well as from current sensors installed on the controller.

Control signals from the main controller AUIA. 206.21.20.00 come to inputs XP2/ «SW1, SW2, SW3» of Master controller AUIA.401.00.00-01 (see Table 6).

Master and Slave controllers AUIA.401.00.00-01 are synchronized with each other through the CAN communication line "XP10".

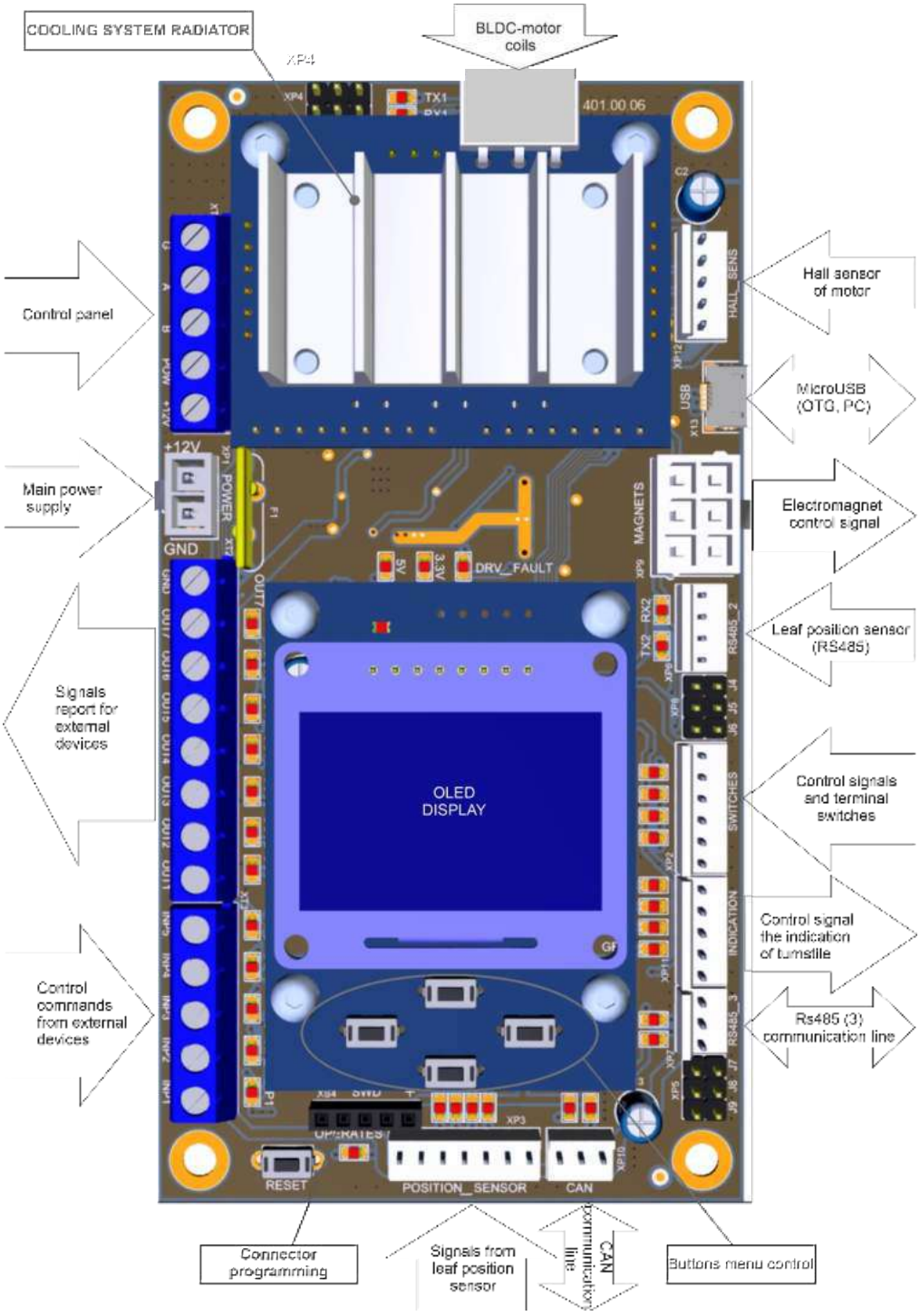
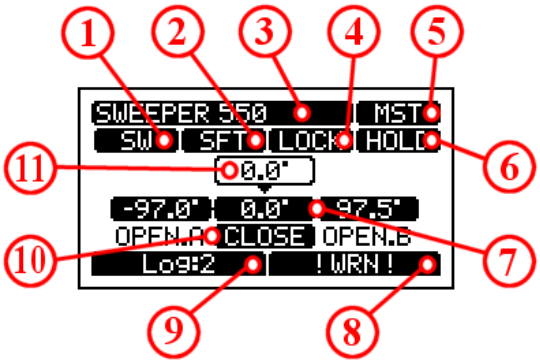


Fig.10 – Appearance of controller AUIA.401.00.00-01

1.5.2.2. Description of the main page of the controller

An OLED display and 4 control buttons are installed on the front side of the AUIA.401.00.00-01 controller for the displaying the current state of the controller and for configuration settings at menu

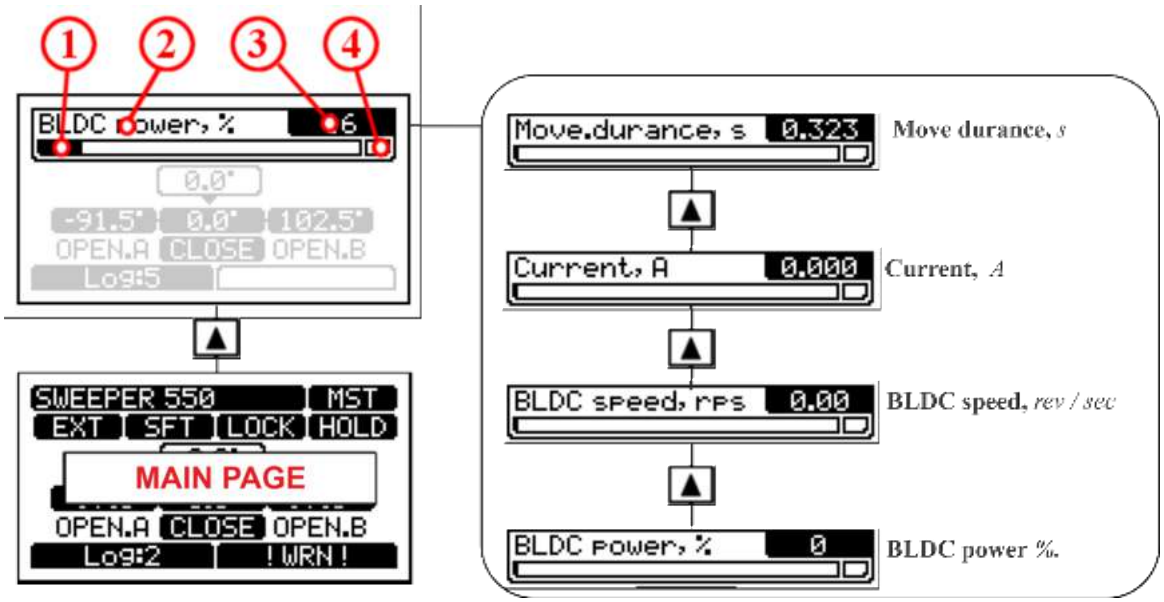
After initialization of the controller the **main page** of the menu is displayed on the screen.



1. Control mode indication
2. PANIC- and SAFETY-mode indication of the turnstile
3. Type and model indication of the turnstile
4. Locking mechanism status indication
5. Solo/Master/Slave modes indication
6. BLDC-drive modes indication
7. Leaf's working range indication
8. Errors and warnings system indication
9. Number of log entries indication
10. Actual control commands indication
11. Actual leaf position indication

Fig.11 – Structure of the main page indications

1.5.2.3. Additional indication of the main page on the OLED display:



Symbols of additional indication of the main page menu

① - parameter value bar in a Range min - max
② - parameter name
③ - numeric parameter value
④ - indicator of reaching and / or exceeding the parameters of the MAX value

Fig.12 – Structure of the additional indication of the main page menu

1.5.2.3. Other pages (functions) of OLED display:

You can toggle to other pages (functions) of display by holding pressed the corresponding button more than 2 seconds:

◄ 2sec - toggle to the system log page
► 2sec - toggle to the current errors page
▲ 2sec - toggle to the paired screen control mode of Slave-cabinet or Master-cabinet motor controller
▼ 2sec - toggle to the system menu page

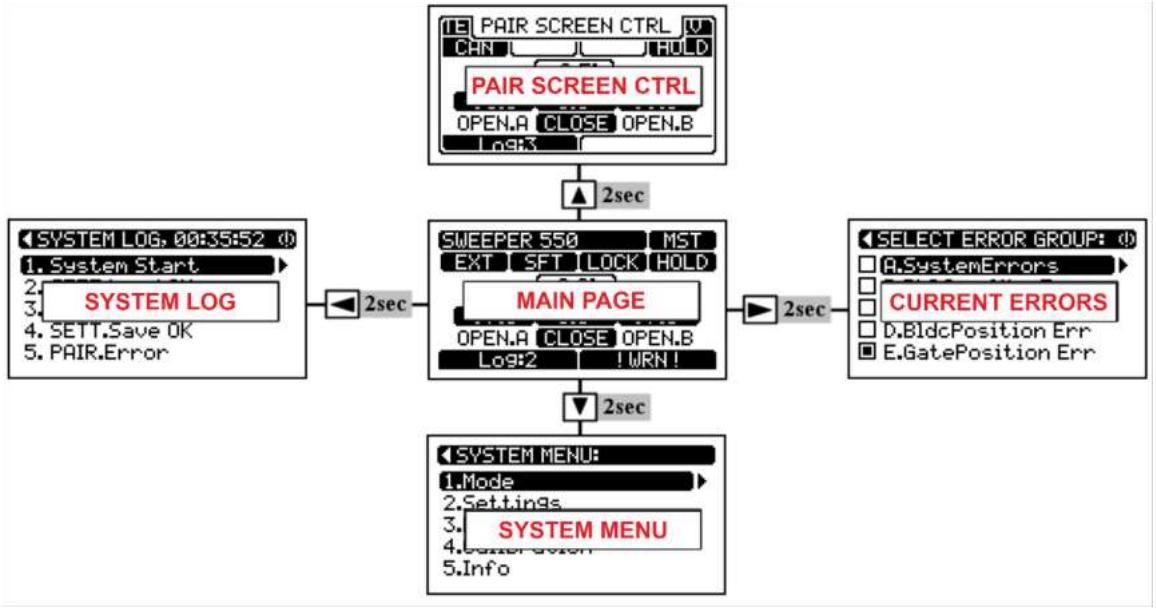


Fig.13 – Switching to other pages (functions) of the menu

1.5.2.4. The purpose of the controller contacts AUIA.401.00.00-01

Table 6- The purpose of the controller contacts AUIA.401.00.00-01

№ Connector/contact	*Description*	*Direction*	*Designation*
XT1/1	G	EXIT	Common wire of the control panel (GND)
XT1/2	A	DATA	RS485 (1) communication line with 7-button TISO control panel
XT1/3	B	DATA	
XT1/4	POW	EXIT	Power output for control panel (+12V)
XT1/5	+12V	EXIT	Power output (+12V) for additional devices
XP1/1	+12V	ENTRY	(+) power supply +12V
XP1/2	GND	ENTRY	(-) power supply (GND)
XT2/1	GND	EXIT	Common for additional devices (GND)
XT2/2	OUT7	EXIT	Not applicable
XT2/3	OUT6	EXIT	Not applicable
XT2/4	OUT5	EXIT	Not applicable
XT2/5	OUT4	EXIT	Not applicable
XT2/6	OUT3	EXIT	Not applicable
XT2/7	OUT2	EXIT	Not applicable
XT2/8	OUT1	EXIT	Not applicable
XT3/1	INP5	ENTRY	Not applicable
XT3/2	INP4	ENTRY	Not applicable
XT3/3	INP3	ENTRY	Not applicable
XT3/4	INP2	ENTRY	Not applicable
XT3/5	INP1	ENTRY	Not applicable
XS1/1	MOT C	EXIT	Connection of BLDC-motor coils
XS1/2	MOT B	EXIT	
XS1/3	MOT A	EXIT	
XP12/1	+5V	EXIT	Power supply for hall sensors of the BLDC-motor
XP12/2	HALL C	ENTRY	Hall sensor signals of BLDC motor
XP12/3	HALL B	ENTRY	Hall sensor signals of BLDC motor
XP12/4	HALL A	ENTRY	Hall sensor signals of BLDC motor
XP12/5	GND	EXIT	GND of hall sensors of BLDC motor
XP9/1	MG1	EXIT	Control signal the magnet of blocking
XP9/2	MG2	EXIT	Control signal the magnet of blocking
XP9/3	MG3	EXIT	Control signal the magnet of blocking
XP9/4	+12V	EXIT	Power supply of the magnet of blocking
XP9/5	+12V	EXIT	Power supply of the magnet of blocking
XP9/6	+12V	EXIT	Power supply of the magnet of blocking

Continued table 6

1	*2*	*3*	*4*
XP6/1	RS - A	DATA	RS 485 (2) communication line with the leaf position sensor
XP6/2	RS - B	DATA	
XP6/3	GND	EXIT	Common
XP6/4	+12V	EXIT	Power supply of leaf position sensor
XP8/1	J1	ENTRY	Jumper of line RS 485 (2) pull up resistor
XP8/2	J2	ENTRY	Jumper of line RS 485 (2) termination resistor (load)
XP8/3	J3	ENTRY	Jumper of line RS 485 (2) pull up resistor
XP2/1	GND	EXIT	Common
XP2/2	SW1	ENTRY	Control signal from AUIA.206.21.20.00 (Open A)
XP2/3	SW2	ENTRY	Control signal from AUIA.206.21.20.00 (Open B)
XP2/4	SW3	ENTRY	Control signal from AUIA.206.21.20.00 (Safety sensor)
XP2/5	SW4	ENTRY	Input signal of limit switch of a locking system
XP2/6	GND	EXIT	Common
XP1/1	RED 1	EXIT	output indication for direction A
XP1/2	GRN 1	EXIT	
XP1/3	RED 2	EXIT	output indication for direction B
XP1/4	GRN 2	EXIT	
XP1/5	+12V	EXIT	Power supply of light indication
XP6/1	GND	EXIT	Common
XP6/2	RS - A	DATA	RS 485 (3) internal communication line between controllers
XP6/3	RS - B	DATA	
XP5/1	J1	ENTRY	Jumper of line RS 485 (3) pull up resistor
XP5/2	J2	ENTRY	Jumper of line RS 485 (3) termination resistor (load)
XP5/3	J3	ENTRY	Jumper of line RS 485 (3) pull up resistor
XP10/1	GND	EXIT	Common
XP10/2	CAN-R	EXIT	CAN communication line between Master / Slave motor controllers of BLDC-motor
XP10/3	CAN-D	EXIT	
XP3/1	+12 V	EXIT	Power supply the BLDC-motor shaft position sensor
XP3/2	SPEED	ENTRY	Signals of BLDC-motor shaft position sensor
XP3/3	ANGLE1	ENTRY	
XP3/4	ANGLE2	ENTRY	
XP3/5	ZERO3	ENTRY	
XP3/6	SET ZERO	EXIT	
XP3/7	GND	EXIT	Common
XP4/1	J1	ENTRY	Jumper of line RS 485 (1) pull up resistor
XP4/2	J2	ENTRY	Jumper of line RS 485 (1) termination resistor (load)
XP4/3	J3	ENTRY	Jumper of line RS 485 (1) pull up resistor
XP13	Micro USB	DATA	Micro-USB Connector for programming and configuration

Refer to the user manual “Controller AUIA.401.00.00-01 of BMDrive motor control” for more information about the operation and setting of the controllers.

2 INTENDED USE

2.1 Operation restrictions

2.1.1 The turnstile must be used in the environment specified in p. 1.1.5 of this document subject to the specifications listed in section 1.2.

2.1.2 It is forbidden to use the turnstile:

– at the presence of mechanical rattle in movable parts of the turnstile;

– when metalwork of the turnstile and its components and accessories are mechanically damaged

2.1.3 List of special operation conditions

- Mean time of the turnstile access (in single access mode) equals to 2 sec.
- The force applied by accessor to barrier rod should not exceed 400H.
- Escape door, portal or cabinet can be installed near the turnstile to increase the turnstile traffic flow capacity in case of emergency

IT IS FORBIDDEN:
to misuse the turnstile (see section 1 "description and operation");
to use the turnstile unearthed;
to use heating pipes and radiations as well as pipes of central water supply for earthing
to repair and adjust without deenergization;
to relocate the objects exceeding the passageway width through the turnstile access area;
to jerk and impact barrier rods, led display or other parts the product, which may cause their mechanical damage;
exert force on leaves more than 400 H (40 kg) in “access locking” mode

2.2 Layout and installation

2.2.1 The turnstile and components of scope of supply to be delivered to installation site in factory packing. The turnstile to be unpacked only on installation site.

2.2.2 Preparation of the turnstile for installation (dismounting) and commissioning to be performed according to this OM with mandatory observation of safety measures specified in p. 2.1 and general electrical safety code.

2.2.3 Safety Measures:

- Installation to be performed only by the persons briefed on safety and studied this manual;
- Only serviceable tools to be used during installation of the turnstile;
- Connection of all cables to be performed only when power supply is OFF;
- Cables to be laid in compliance with electric code;
- The turnstile to be installed by at least 2 installers.

2.2.4 Tools and accessories to be used (Fig.14):

– puncher;
– concrete drills (according to diameter of anchors included in the turnstile scope of delivery;
– extension cord;
– kit of end and pin wrenches;
– kit of hexagons;
– kit of screwdrivers;
– hammer;
– multimeter (tester);
– measuring tape ;
– marker;
– pliers, side cutters;
– builder's level.

Fig.14 - Tools and accessories for layout and installation

2.2.5. Total configuration of the "Sweeper-BM" turnstile lanes

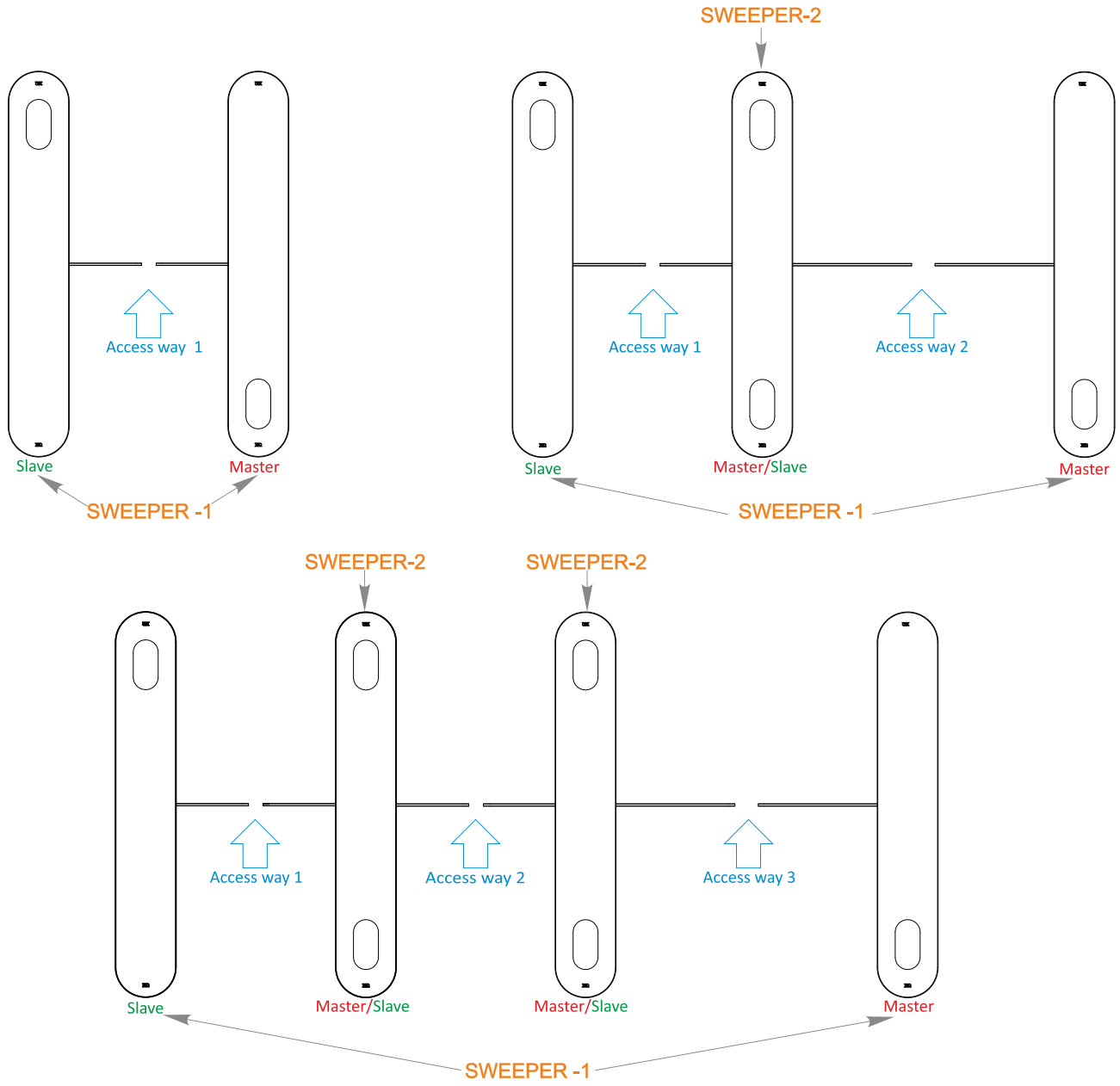


Fig. 15 – The "Sweeper-BM" turnstile lanes arrangement options

WARNING:
The damages occurred during the turnstile transportation are not covered by the manufacturer's warranty liabilities

2.2.6. Installation procedure.

The turnstile installation procedure is as follows:

1) Damages to be fixed (picture to be taken, damage report to be made).

2) The turnstiled to be unpacked and inspected for defects and damages as well as completeness to be checked according to the turnstile data sheet;

WARNING:
When the turnstile damages are detected or in case of shortage of delivery installation work to be stopped and the turnstile supplier to be referred to.

3) Turnstile dismantling and relocation:

The turnstile cabinet removal from pallet (See Fig.12). The side pieces to be opened to provide access to fixation holes. The side pieces are designed as a hinged door and are closed with locks.

- Locks to be unlocked by key and door to be turned from both sides of cabinet (View A);
- Two screws at the bottom of the turnstile frame from both sides of cabinet to be loosened and removed (View B);
- The turnstile to be removed from pallet

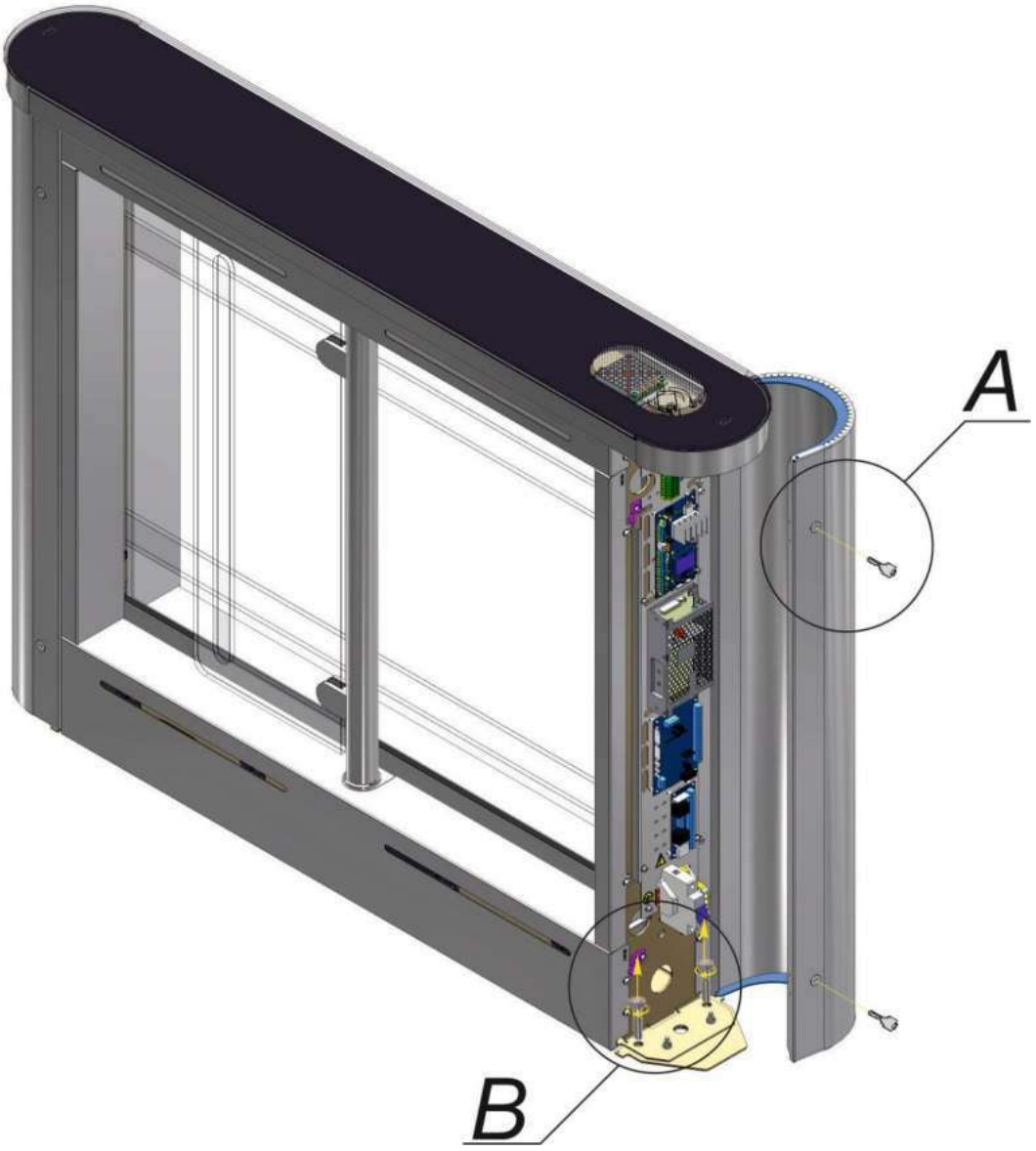


Fig. 16 – Turnstile dismantling and relocation from pallet

4) Make sure that the turnstile installation area is ready as follows:
- The installation area surface to be flat;
- Thickness of concrete blinding coat under installation area to be at least 150 mm.

WARNING:
The turnstile is fixed by means of Redibolt anchors (with jacket and screw) included in the scope of delivery.

5) The turnstile fixation holes to be marked on the area surface according to Figure 17 (for turnstiles with 550 mm and 900 mm lanes). The turnstile itself can be used as a template.

IMPORTANT! Cabinets are linked by control line optical sensor system requirering accurate positioning of cabinets. The relative position of cabinets and vertical position of the turnstile to be respected.

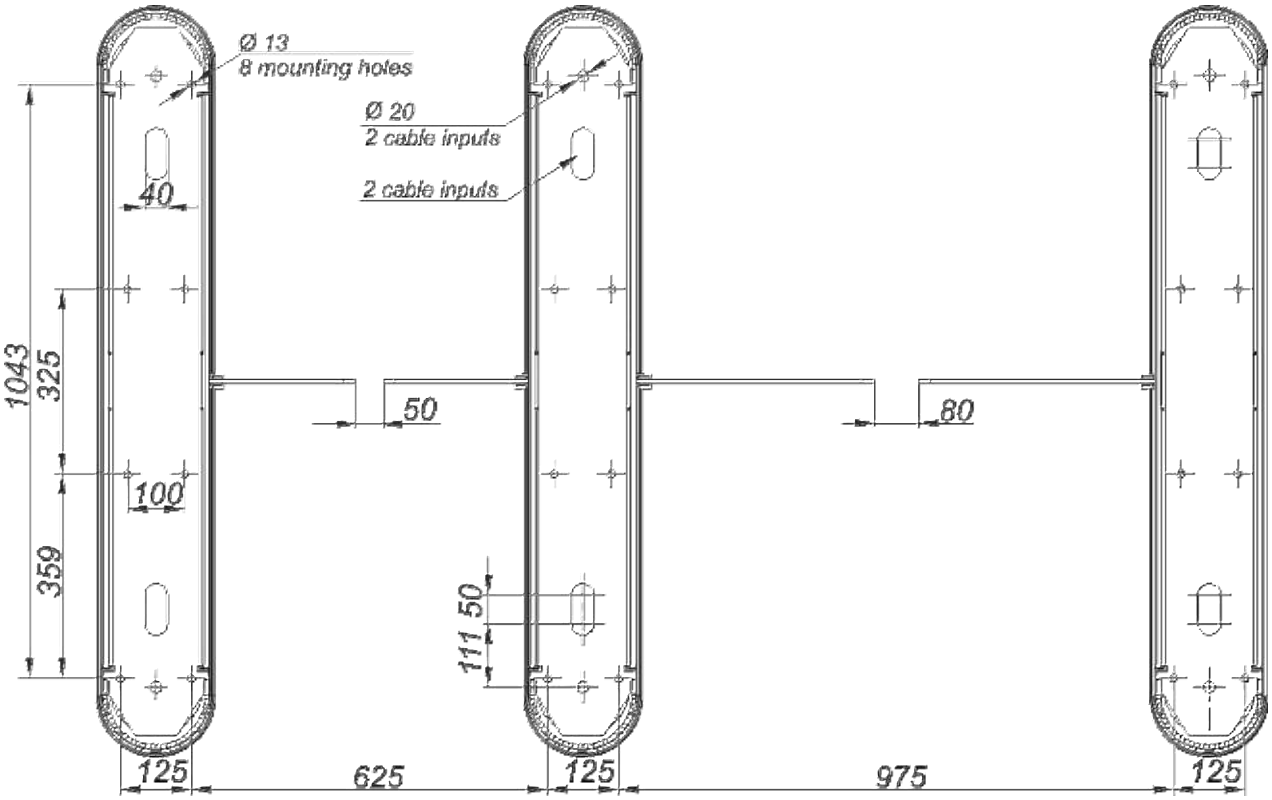


Fig. 17 – Installation dimensions of the "Sweeper-BM-1" and "Sweeper-BM-2" turnstiles set

6) The relevant holes to be drilled on the surface according to the marking due to diameter of anchors (12×120M10) for the turnstile fixation included in the scope of delivery.

7) Anchor jackets to be inserted into the prepared holes.

WARNING:
The turnstile installation and fixation to be performed only after all electric cables are pulled.

8) The following cables to be run to the turnstile installation site *(Fig.18);*
- Power supply cable 230 V ~;
- Control desk link cable;
- Access Control System (ACS) connection cables, if available;
- Cables between cabinets

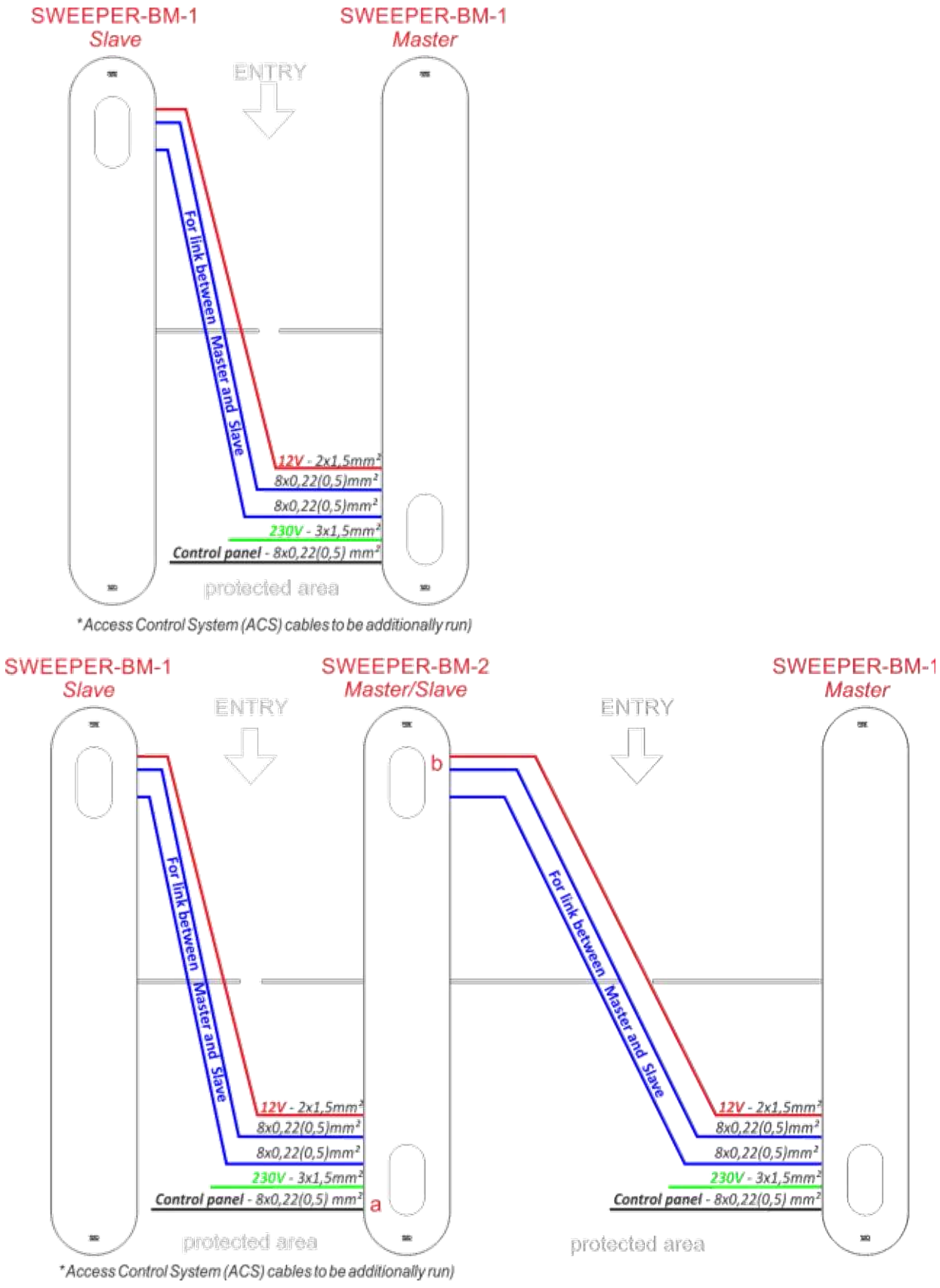
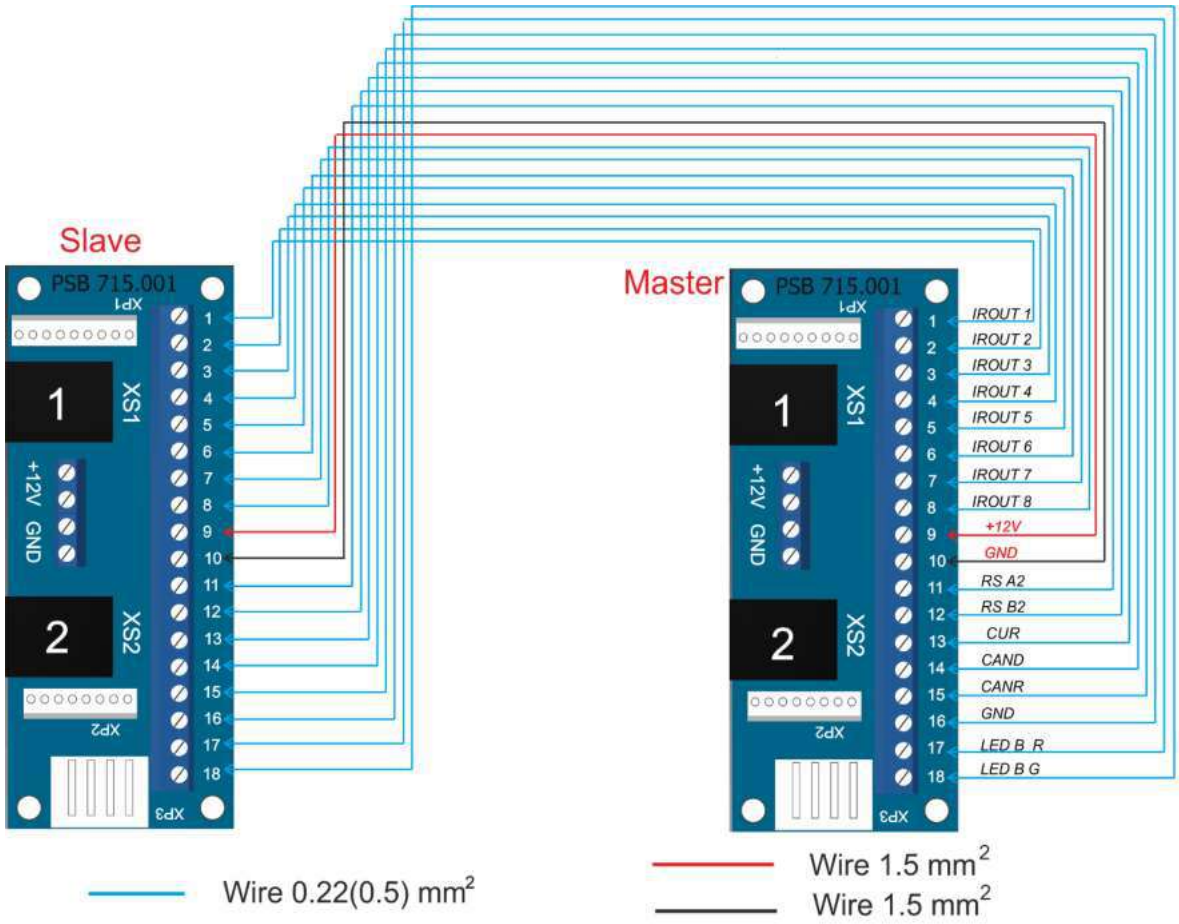


Fig. 18 – General view of connection between cabinets

Option 1



Option 2

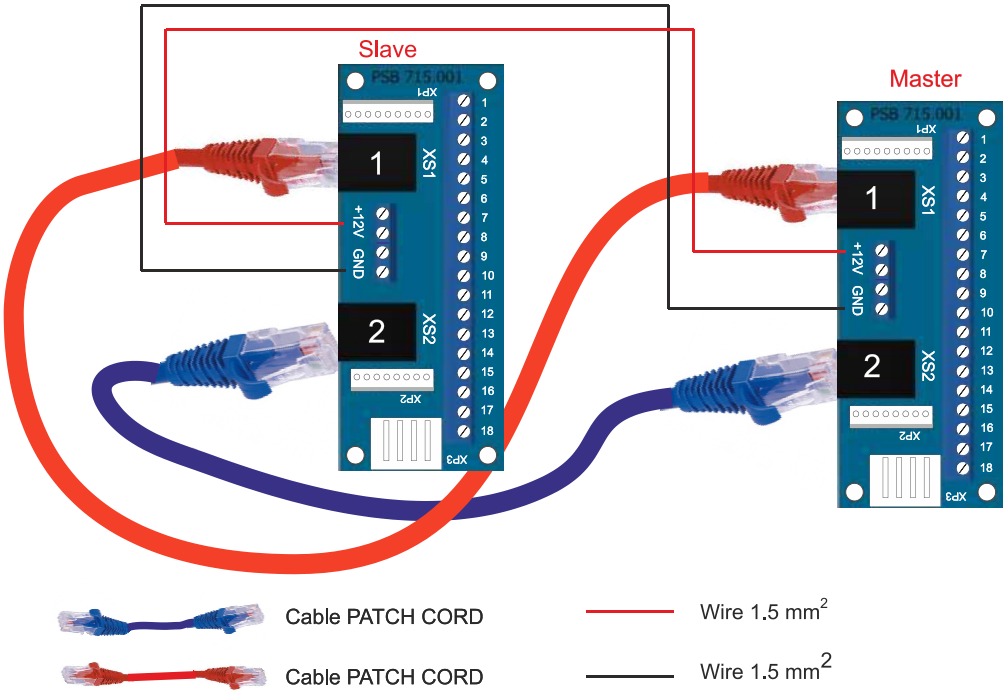


Fig. 19 – Options of cable connection between cabinets Master and Slave

Cables to be run in corrugated or metal pipes.

9) The length of cable free ends to be at least 1 m to provide their entry, termination and connection to the relevant terminals in the turnstile rack.

10) The cable outlet point to be aligned with the hole on the turnstile frame mounting plate.

11) To access the fixation holes and terminal blocks it is required to do the following on both sides of cabinet:

1. - Locks to be unlocked by key and door to be turned (See Fig. 20);
2. - Bottom linings to be removed by unscrewing screws;
3. – The top lid to be removed;
4. – The turnstile to be installed upright at the prepared location

Cables to be pulled through available access hole in the turnstile rack bottom end part by reclining the turnstile;

5 – The readers to be installed (see further point 13);

6. - Fixation holes at the turnstile bottom plate to be aligned with the prepared surface holes according to the marking in Fig.17;

The turnstile to be fixed by means of anchors included in the scope of delivery.

7.- The glass leaves to be installed on the glass holder shaft and adjust the zero position of the leaves(see further par.4.3)

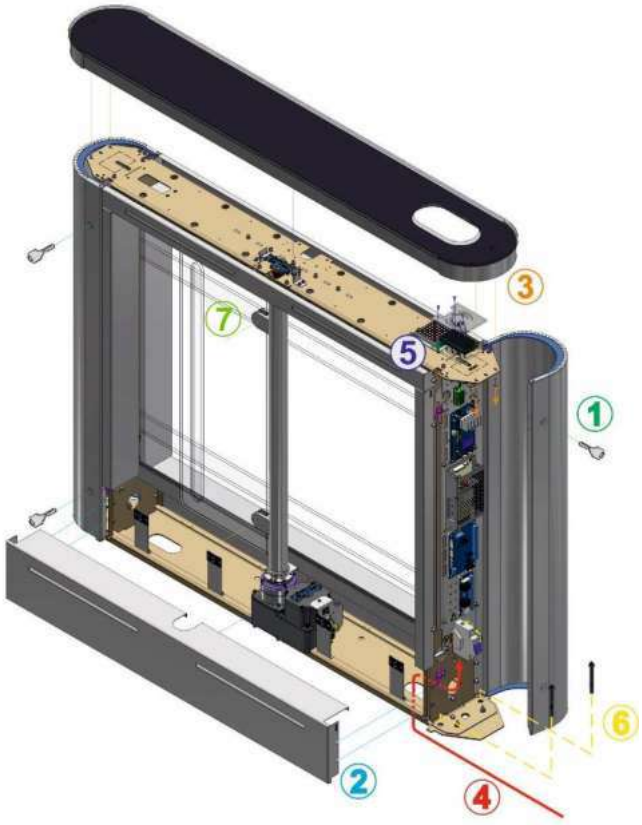


Fig. 20 - General view of the "Sweeper-BM-1" turnstile cabinet installation

12) Turnstile connection:

a) Power supply cable ~230 V to be connected *(Fig. 21):*

- Phase L to be connected to circuit breaker;
- Neutral (N) to be connected to terminal ~230V (N);
- Earth (PE) to be connected to earthing terminal (PE)

b) Control desk link cable to be connected to terminals *(Fig.22):*

- **P (Power)** – control desk power supply +12V;
- **G (GND)** – common wire of control desk;
- **A (RSA)** – RSA wire of control desk link;
- **B (RSB)** – RSB wire of control desk link;

c) The turnstile to be earthed, power supply cable to be connected the turnstile according to the wiring diagrams (See Annex C).

d) Proximity card readers to be installed, if access control system (ACS) is available.

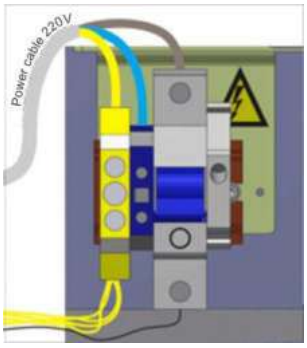


Fig. 21– Connection of power supply cable

The countertop and side pieces to be installed at the locations of their fixation and the door locks to be locked upon completion of the required installation..

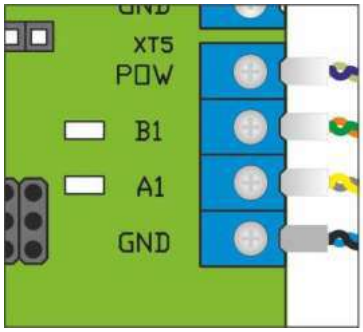


Fig. 22 – Connection of control desk link cable to terminals AUIA.206.21.20.00

13) Installation of proximity card reader∗[1] upon availability of access control system (ACS)

- The turnstile lid ***b*** (or glass top) to be removed by unscrewing screws **a** from frame *(Fig.23);*
- Screws to be unscrewed and acrylite to be removed;
- The maximum height of the card reader to be installed is 25 *mm* with specified permissible dimensions 110x80 *mm*;
- Acrylate to be fixed with screws in the previous position;
- The turnstile lid (top) to be installed and fixed with screws in the previous position.

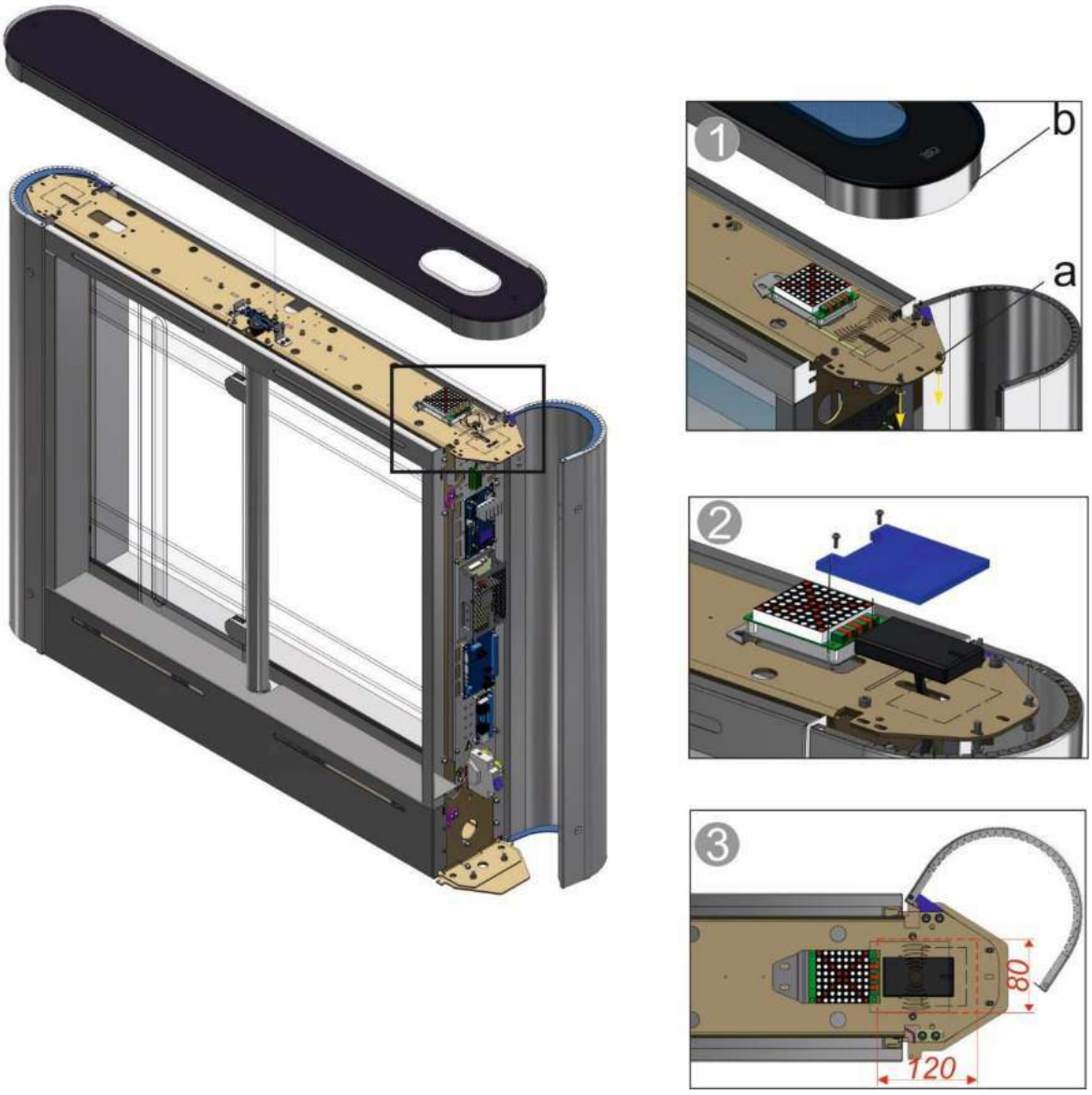


Fig.23 – Installation of card reader into the turnstile cabinet

[1] Optional

2.3 Turnstile preparation for use

2.3.1 Commissioning guidelines

Prior to the turnstile energization:

1) make sure of proper connection and good condition of all connecting cables;

2) clear the turnstile leaf swing area from foreign particles.

When mains cable of power supply unit is connected to the network the turnstile operating mechanism is energized: leaves are locked from swinging in both directions barring access.

The turnstile is put in initial state: Entry and Exit LED display is blue.

The turnstile performance to be checked at least 10 times in both directions upon generation of the appropriate opening command (entry, exit)..

2.3.2 Required inspections

2.3.2.1 When the turnstile is commissioned it is necessary to perform the inspections specified in Table 7. During inspections the wiring diagram according to Annex C and the control desk according to Anne B to be used.

Table 7

Operation Mode	*Mode Setting*	*LED display*	*Functional check*
1	*2*	*3*	
1. Turnstile is closed in both directions (initial state)	–	Blue LED brightness is changed. Glass partition blue backlight is lit	Make sure that swing leaves can't be rotated in either direction
2.Single access in one direction	"SINGLE" button to be pushed for access in chosen direction («A» or «B»)	Green arrow of authorized single access in chosen direction is lit and blue LED brightness is changed in opposite direction. Glass partition backlight is lit green	Swing leaves are rotated at 90° in the intended direction
3. Single access in both directions	Both "SINGLE" buttons to be pushed for access in both directions («A» and «B»)	Green arrows of authorized single access in both directions are lit. Glass partition backlight is lit green	Swing leaves are rotated at 90° in the intended direction
4. Free access in one direction	"FREE" button to be pushed for access in chosen direction («A» or «B»)	Green arrow of authorized free access in chosen direction is lit and blue LED display is lit in opposite direction	Swing leaves are rotated at 90° in the intended direction
5. Free access in both directions	Both "FREE" buttons to be pushed for access in both directions («A» and «B»)	Green arrows of authorized free access in both directions are lit	Swing leaves are rotated at 90° in the intended direction
6 Single access in one direction and free access in opposite direction	"SINGLE" button to be pushed for access in chosen direction («A» or «B») and "FREE" button to be pushed for access in opposite direction	Green arrow of authorized single access in chosen direction is lit and green arrow of authorized free access in opposite direction is lit	Swing leaves are rotated at 90° in the intended direction
7 Single access in one direction and locked access in opposite direction	SINGLE" button to be pushed for access in chosen direction («A» or «B») and "LOCK" button to be pushed to lock access in opposite direction	Green arrow of authorized single access in chosen direction is lit and red LED display of locked access direction is lit	Swing leaves are rotated at 90° in the intended direction
8. Free access in one direction and locked access in opposite direction	"FREE" button to be pushed for access in chosen direction («A» or «B») and "LOCK" button to be pushed to lock access in opposite direction	Green arrow of authorized free access in chosen direction is lit and red LED display of locked access direction is lit	Make sure that swing leaves are rotated at 90° in the intended direction.

Continued Table 7

1	*2*	*3*	*4*
9. Locked access in one direction	"LOCK" button to be pushed to lock access in chosen direction ("A" or "B")*	Red LED of locked access in one chosen direction is lit	Make sure that swing leaves are locked
10. Locked access in both directions	Both "LOCK" buttons to be pushed to lock access in both directions ("A" and "B")**	Red LED of locked access in both directions is lit	Make sure that swing leaves can't be rotated in either direction
11. Activation of "panic" mode	"PANIC" button to be pushed and hold within at least 7 sec.**	Green arrows of authorized free access in both directions are lit	Swing leaves are opened in different directions
12 Deactivation of antipanic device	"PANIC" button to be pushed	Blue LED brightness is changed. Glass partition blue backlight is lit	Make sure that swing leaves can't be rotated in either direction
** In this case other control desk buttons of single and free access in chosen direction are locked.* *** In this case all control desk buttons of single and free access in both directions are locked.*			

2.3.2.2 After all checks are completed and satisfactory results are achieved, the turnstile is ready for long-term operation.

2.4 Contingency actions

For emergency human escape (in case of fire, acts of God etc.) and enabling free access the turnstile to be unlocked from control desk by issuing the relevant command. For full opening of access way to be used "PANIC" button on control desk to be pushed and held for more than 7 seconds or a signal is sent to the relevant input (in3) of the turnstile controller.

In case of mains power failure the turnstile automatically switches to power supply from backup battery (optional).

If the mains power is not recovered and battery is discharged, the glass leaves are unlocked (fail safe) and to be swung aside manually to create free access way.

3 MAINTENANCE

3.1 General guidelines

3.1.1 Commissioning and subsequent maintenance of the turnstile to be performed only by the staff to be in charge of the turnstile.

3.1.2 The turnstile to be serviced only by the staff having the relevant electrical safety qualification level according to the national requirements.

3.1.3 The turnstile to be installed and operated only by the qualified safety briefed staff having the relevant class of permit to work with electrical facilities with voltage up to 1000V, being aware of this OM, the turnstile design and principle of operation.

3.2 Safety Measures

3.2.1 During the turnstile maintenance the relevant safety measures to be observed according to p.2.1 to be observed.

IT IS FORBIDDEN:
TO USE DEFECTIVE APPLIANCES, TOOLS, FUSES INSTRUMENTATION THE SERVICE LIFE OF WHICH HAS EXPIRED.

3.2.2 When instrumentations are prepared for operation it is necessary to strictly comply with the safety requirements specified in instrumentation instruction manuals.

3.3 Maintenance procedure

3.3.1 The turnstile maintenance includes preventive measures which are taken according to the established frequency to maintain the turnstile in operational condition, decreasing of component wearing and prevention of faults and malfunctions.

3.3.2 Daily and periodic maintenance of the turnstile are recommended.

Normally the daily maintenance is carried out before the beginning of operation or during operational timeout and includes visual inspection of the turnstile's housing and, if required, troubleshooting of mechanical damages, surface corrosion and contamination.

IT IS FORBIDDEN:
TO USE ABRASIVE AND CHEMICALLY ACTIVE SUBSTANCES DURING CLEANING OF CONTAMINATED EXTERNAL SURFACES OF THE TURNSTILE.

The recommended stainless steel detergents are given in Table 8.

Table 8

Detergent description	*Manufacturer*	*Country of origin*
Stainless steel cleaning spray “Stainless Steel Cleaner And Polish”	3M	Group of European companies
Cleaning fluid “Well Done”	Well Done	Hungary
Stailess steel products and other metals cleaner "XANTO STEEL 3in1"	XANTO	United Kingdom
Foam “Dr.BECKMANN”	Dr.Beckmann	Germany
Cleaning solution “Reinex Edelstahlreiniger”	Reinex	Germany
“Stainless steel cleaner”	Onish	United Kingdom

3.3.3 Periodic maintenance to be performed at least twice year and includes as follows:

- visual inspection of the turnstile's housing, control mechanism and other components for absence of external damages (corrosion, warps and other mechanical defects and pollutions;
- visual inspection of connecting, network and earthing cable condition;
- verification of the turnstile performance;
- during manual control in the modes specified in Table 7 or when identification cards are used;
- verification of reliability of the turnstile screw joints and earthing connections.

4 ROUTINE MAINTENANCE

4.1 General guidelines

Minor malfunctions of the turnstile are listed in *Table 9* and to be remedied by the customer. More complicated malfunctions to be remedied by the manufacturer's representative.

IMPORTANT:
INSPECTION, CLEANING, REPAIR OF THE TURNSTILE COMPONENTS TO BE PERFORMED ONLY AFTER THE TURNSTILE DEENERGIZATION!

4.2 Possible malfunctions

Possible malfunctions of the turnstile and their remedies are listed in Table 9

Table 9 - Possible malfunctions

Malfunction	*Possible cause*	*Solution*
1	*2*	*3*
The turnstile does not work after power ON	• Lack of AC power. • The power cable is not connected. • Power supply unit is out of order. • Circuit breaker switched off inside the turnstile	✓ AC power to be recovered. ✓ Power supply cable to be connected. ✓ Power supply unit to be replaced. ✓ Switch on the power supply circuit breaker
Leaves do not open after giving a command from the ACS or a command from a wired 7-button. control panel	• Turnstile does not obtain permission signal from ACS • No communication with the control panel • There are critical errors on motor controllers that have been identified by the self-diagnosis system.	✓ Check the presence of a trigger signal from the ACS ✓ Check the correct connection of the wired 7-button control panel ✓ Check and eliminate the causes of occurrence critical errors, that have been identified by the self-diagnosis system of the motor controller
Leaf knocks at the end of movement, when opening or closing.	• Leaf isn't calibrated correctly, zero point isn't adjusted. • There are critical errors on motor controllers that have been identified by the self-diagnosis system. • The mechanical stoppers of the mechanism are not adjusted	✓ Follow set zero leaf position setting procedure (see point 4.3) ✓ Check and eliminate the causes of occurrence critical errors, that have been identified by the self-diagnosis system of the motor controller ✓ Adjust the mechanical stoppers, after that follow set zero leaf position setting procedure (see point 4.3)
Control panel sound alarm and blinking with red indicator of bad "communication" signal	• Control panel don't have communication with main controller	✓ Check wires for damages and check wire connection of the control panel to the main controller (AUIA.206) ✓ Check the control panel for functionality
LED display is out of order	• No contact with controller • Wires are damaged • LED indicator is out of order	✓ Check wires for damages and check inter-cabinet connection wires. ✓ Check the indications wires for damages ✓ Check the LED indications boards ✓ LED indication board to be replaced.
Control panel sound alarm (error) and continuously lit red indication of turnstile	• Bad connection between the two cabinets of turnstile • Infrared sensors don't see each other. • Infrared sensors are out of order.	✓ Check wires for damages and check inter-cabinet connection wires. ✓ Protective plexiglass of the passage sensors to be cleaned from dust dirt ✓ Check infrared sensors for functionality. ✓ Infrared sensors to be replaced if they are out of order.
Leaf stays in semi-open position	• Mechanism jamming • There are critical errors on motor controllers that have been identified by the self-diagnosis system.	✓ Leaf opening manually to be checked with turned off power supply. ✓ Check the mechanism for jamming and backlash ✓ Check the zero position setting ✓ Check and eliminate the causes of occurrence critical errors, that have been identified by the self-diagnosis system of the motor controller

Continued table 9

1	*2*	*3*
Leaf remains open	• Mechanism jamming • "FREE ACCESS" mode is set. • Infrared sensors are out of order. • There are critical errors on motor controllers that have been identified by the self-diagnosis system.	✓ Leaf opening manually to be checked with turned off power supply. ✓ Mechanism components to be checked ✓ "Free access" mode to be turned off ✓ Sensor adjustment to be checked. ✓ Check and eliminate the causes of occurrence critical errors, that have been identified by the self-diagnosis system of the motor controller
Leaf slow opening	• Mechanism jamming. • Infrared sensors don't see each other. • Infrared sensors are out of order. • There are critical errors or was defined obstacles on motor controllers that have been identified by the self-diagnosis system. • Turnstile type or leaves size selected incorrectly on motor controllers	✓ Leaf opening manually to be checked with turned off power supply. ✓ Check the mechanism for jamming and backlash ✓ Check infrared sensors for functionality. ✓ Check and eliminate the causes of occurrence critical errors, that have been identified by the self-diagnosis system of the motor controller ✓ Obstacle detection sensitivity settings to be checked ✓ Check the correspondence of the type of the turnstile and the leaves size parameters at the motor controllers setings.

4.3. Adjustment of the zero position of leaf for "Sweeper-BM-1"

- For "Sweeper -BM" turnstiles, the zero position can be at point **CLOSE (0°)**. For turnstiles of this type, the zero position is set manually by the user during working area searching.
- The working area search procedure can be launched: from the Master or Slave cabinet controllers and from any turnstile mode, at any menu page.;
- For a more detailed description of the turnstile operation settings, please refer to the manual "AUIA.401.00.00-01 . QuickStart"

The turnstile leaf initialization procedure can be started in two ways:

<u>Option 1:</u> (with PCB.730.002.01 *fig.24***)**

- Press and hold the **ZERO** (***1***) button on the PCB.730.002.01 controller of the leaf magnetic sensor. The turnstile will go into «***OFF***» mode and a message (***2***) *«gate sensor zero-button is pressed»* will appear on the display of the AUIA.401.00.00-01 controller.
- While holding the ZERO ***(1)*** button manually set the zero point of both leaves of Master and Slave cabinets (**CLOSE** position ***(3))***
- After releasing the ***ZERO (1)*** button the turnstile will save the user-set point as zero (**CLOSE** position *(3)*).
- The controller will start the working area search procedure and automatically determine the minimum and maximum of working area.
- Following a successful procedure, The controller will display a message for a few seconds *«The workspace search was successful»* and then switch to the home page:
- Turnstile is ready for work.

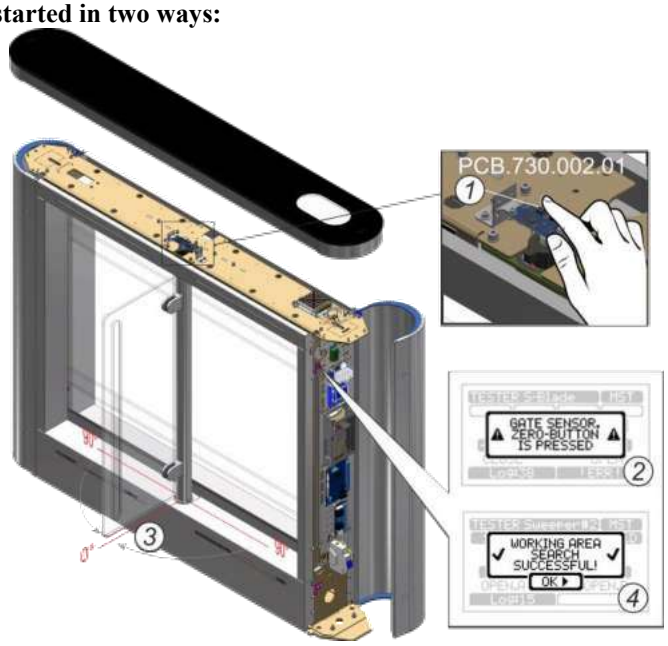


Fig.24 –Adjustment of the leaf zero position using the "zero" button

Option II **(with AUIA.401.00.00-01** *fig.25***)**

- Run the menu holding for 2 seconds the lower button (***1***) on the controller **AUIA.401.00.00-01** and choose "**Calibration**"->"**GateZeroSet**" controller. If you request a calibration procedure, the turnstile will go to **"OFF"** mode.
- Set the zero point of both leaves of Master and Slave cabinets manually (CLOSE position (3))
- Confirm the start of working area search procedure by pressing "**YES**" (2) on the AUIA.401.00.00-01 controller display**.**
- The controller will save the user-set point as zero (**CLOSE** position *(2)* and automatically determine the minimum and maximum of working area.
- Following a successful procedure, The controller will display a message for a few seconds *«The workspace search was successful»* and then switch to the home page:
- Turnstile is ready for work.

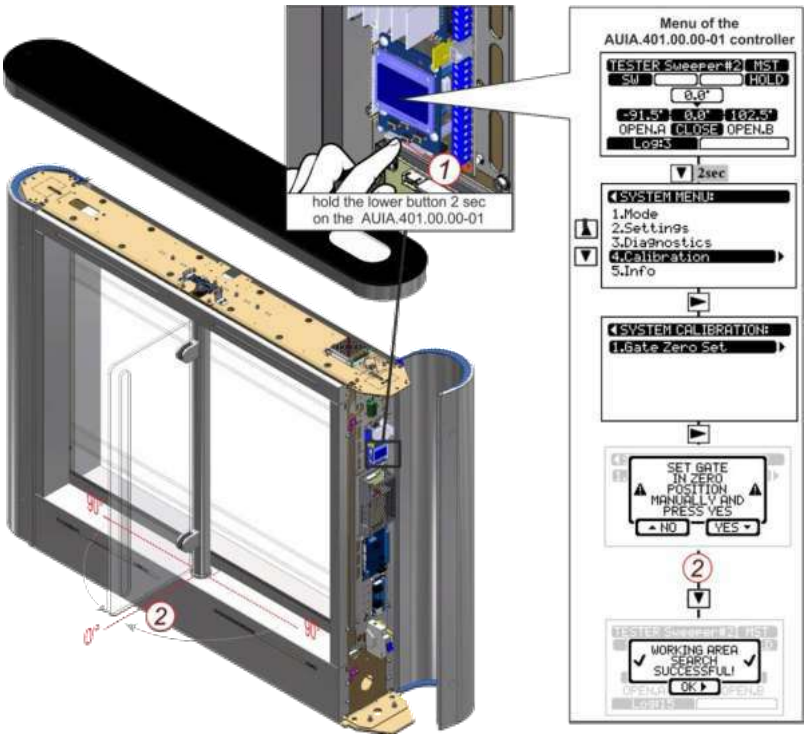


Fig.25 – Adjustment of the leaf zero position using the menu of controller AUIA.401.00.00-01

5 TRANSPORTATION AND STORAGE

5.1 Turnstile storage

It is forbidden to subject the turnstile to jerks and impacts during storage. Transportation trolleys to be used for handling of the turnstile. In storage facilities there should not be aggressive gases and vapours causing metal corrosion. Air temperature during storage should not be below +5° C and above +40° C and relative air humidity should not be more than 80% at the temperature 20° C.

5.2 Turnstile transportation

The ready-to-install turnstile to be transported according to the transportation regulations related to the relevant mode of transport, such as:

– in railway or special containers;
– in closed vehicles;
– waterborne (in ship's hold) .

Transportation on open platforms is allowed. In this case the packed turnstile should be covered with canvas. Air temperature during transportation should not be below -40°C and above +50°C.

After transportation or storage of the turnstile at negative temperatures or increased humidity the turnstile to be kept indoor with normal climatic conditions without original packing within 12 hours before commissioning:

1) ambient temperature: + 15°C to +35°C;
2) relative humidity: 45% to 80 %;
3) atmospheric pressure: 84,0 to 106,7kPa (630-800 mm)

6 DISPOSAL

The turnstile design does not contain materials environmentally hostile and hazardous to health and special measures are not required for its disposal.

Annex A.Overall and installation dimensions of the “Sweeper-BM-1” and “Sweeper-BM-2” type turnstile

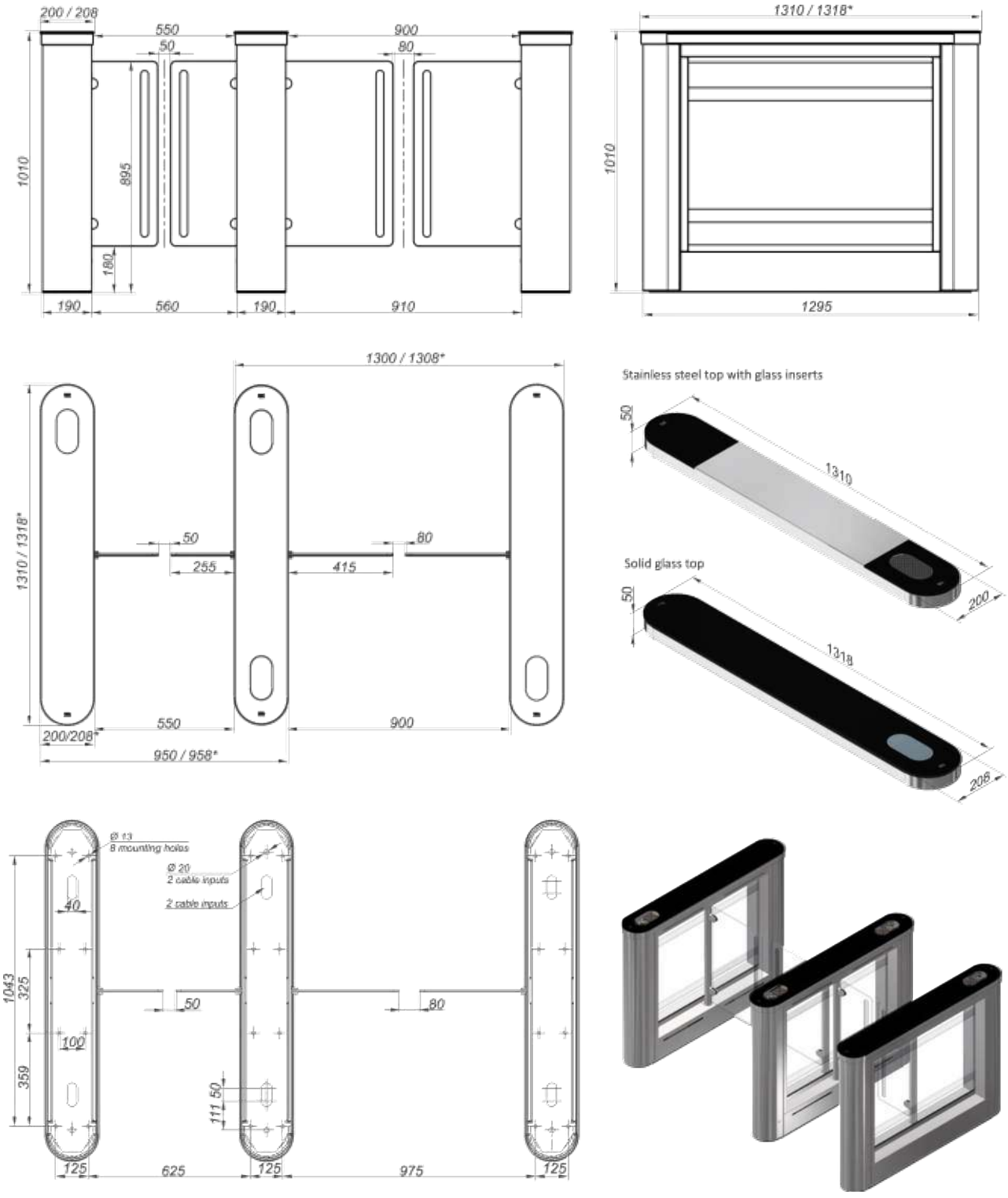
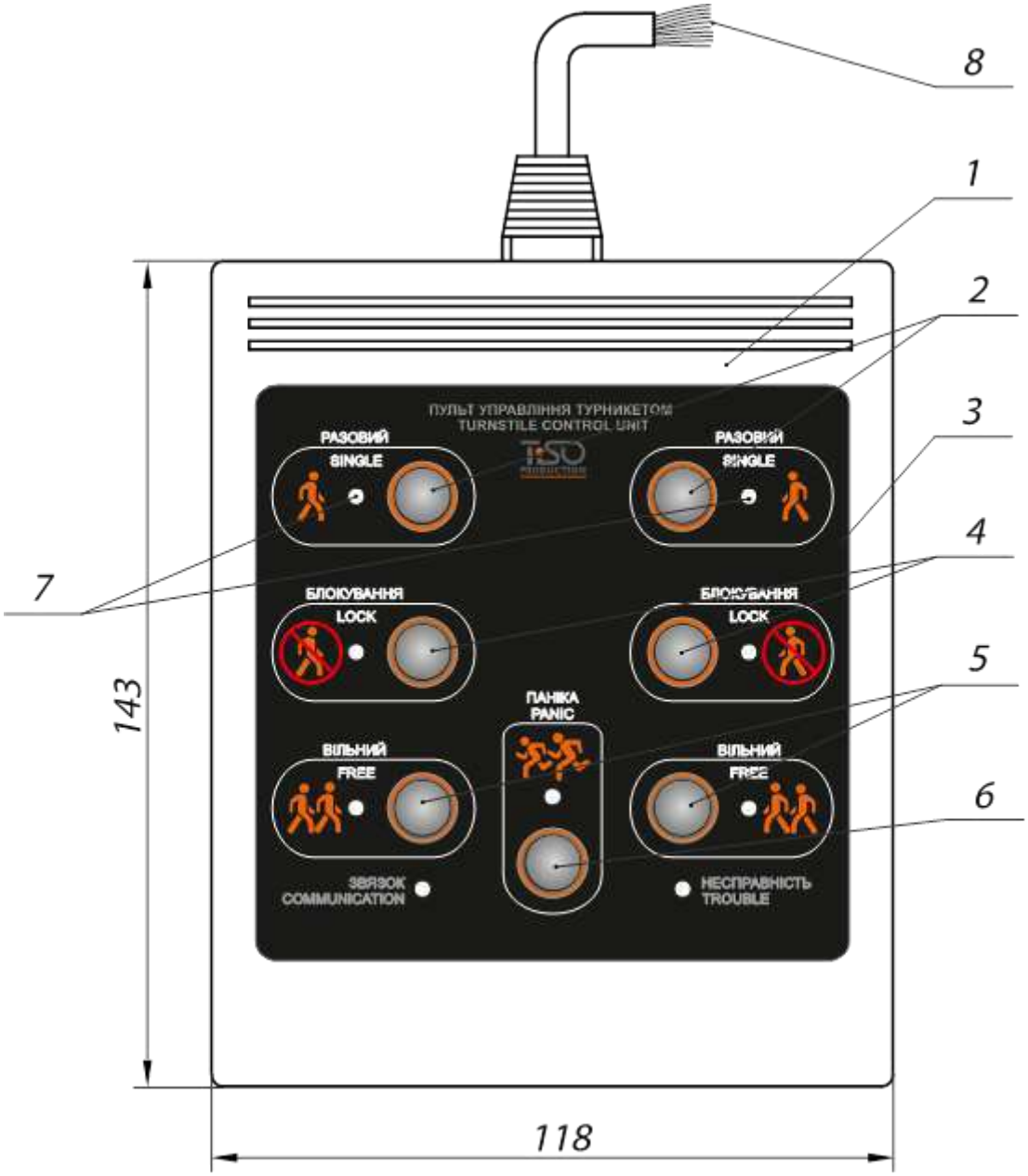


Figure A.2 – Installation dimensions of group of the turnstiles T3.KCD.XD.X/550/900 and T3.KCD.XD_/900/550

Annex B. **Control desk and connection diagram**



1 – control panel body;
2 – "SINGLE ACCESS" mode control button
3 – front plate;
4 – "LOCK" mode control button;
5 – "FREE ACCESS" mode control button
6 – "PANIC" mode control button
7 – access direction LED display;
8 – controller connection terminals

Fig. B.1 – Control panel AUIA.114.02.00.00

Continued Annex B. **Control panel and connection diagram**

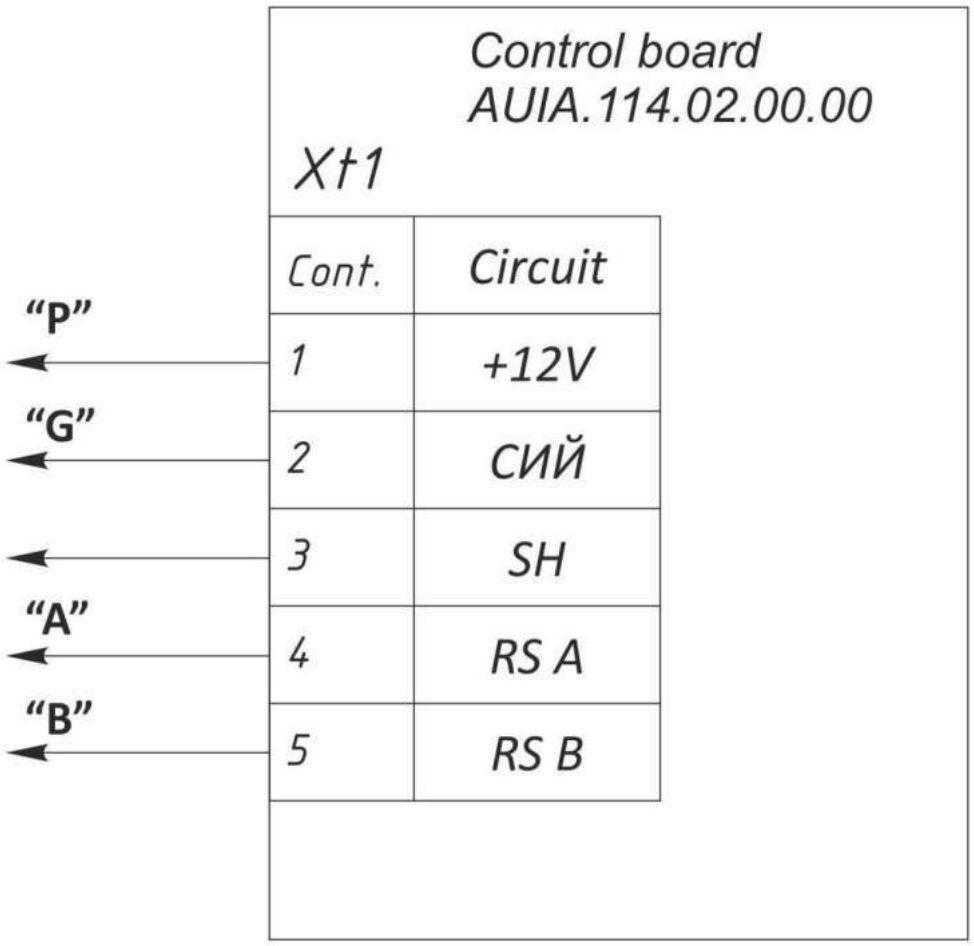
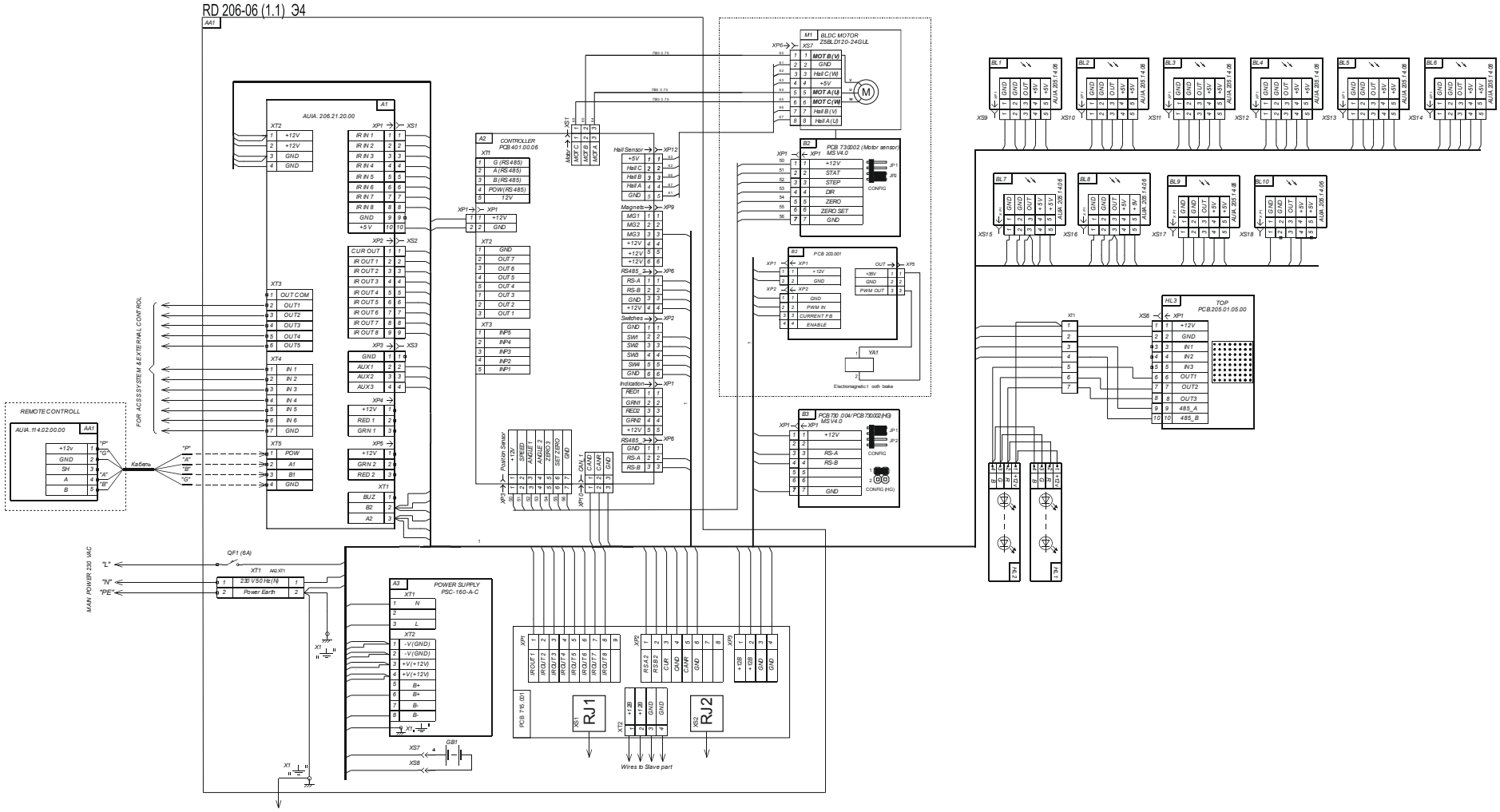
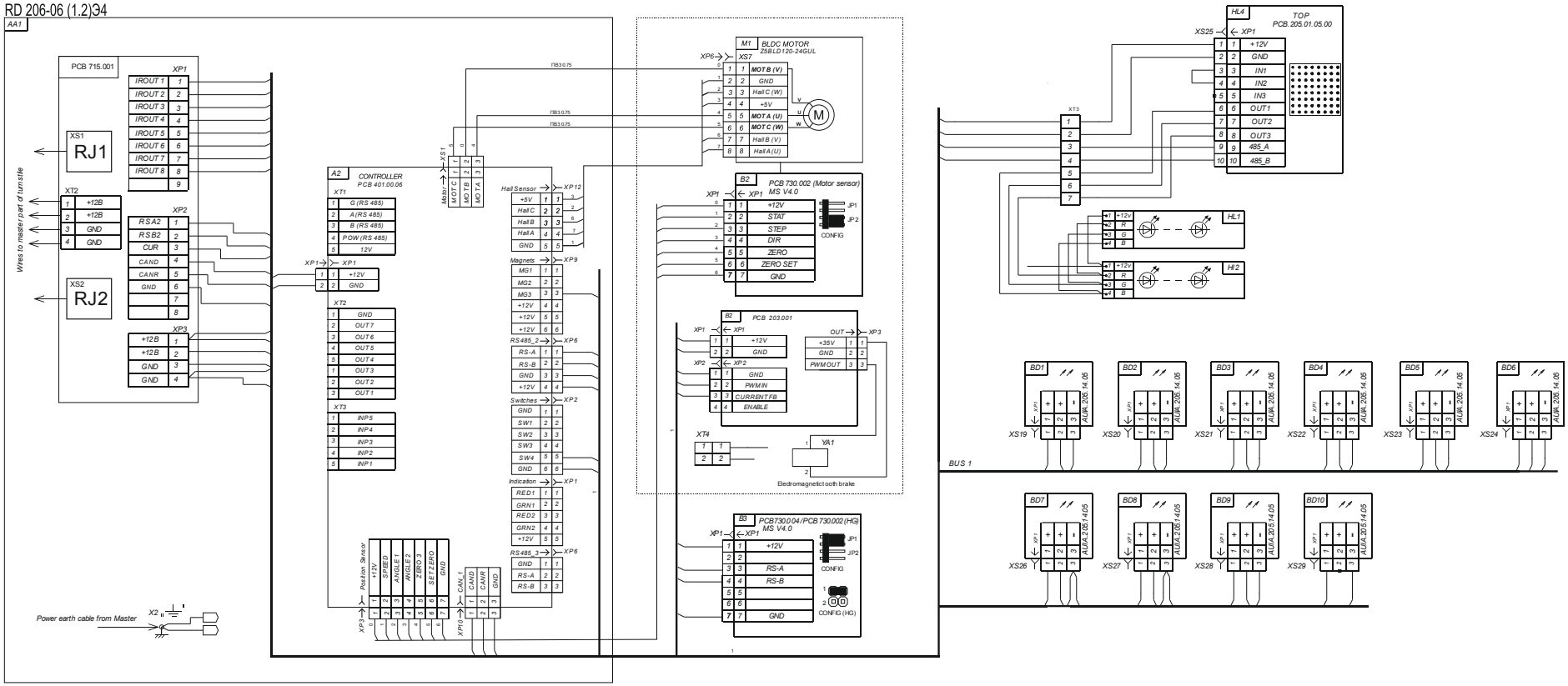


Fig. B.2 – Connection diagram of control panel AUIA.114.02.00.00

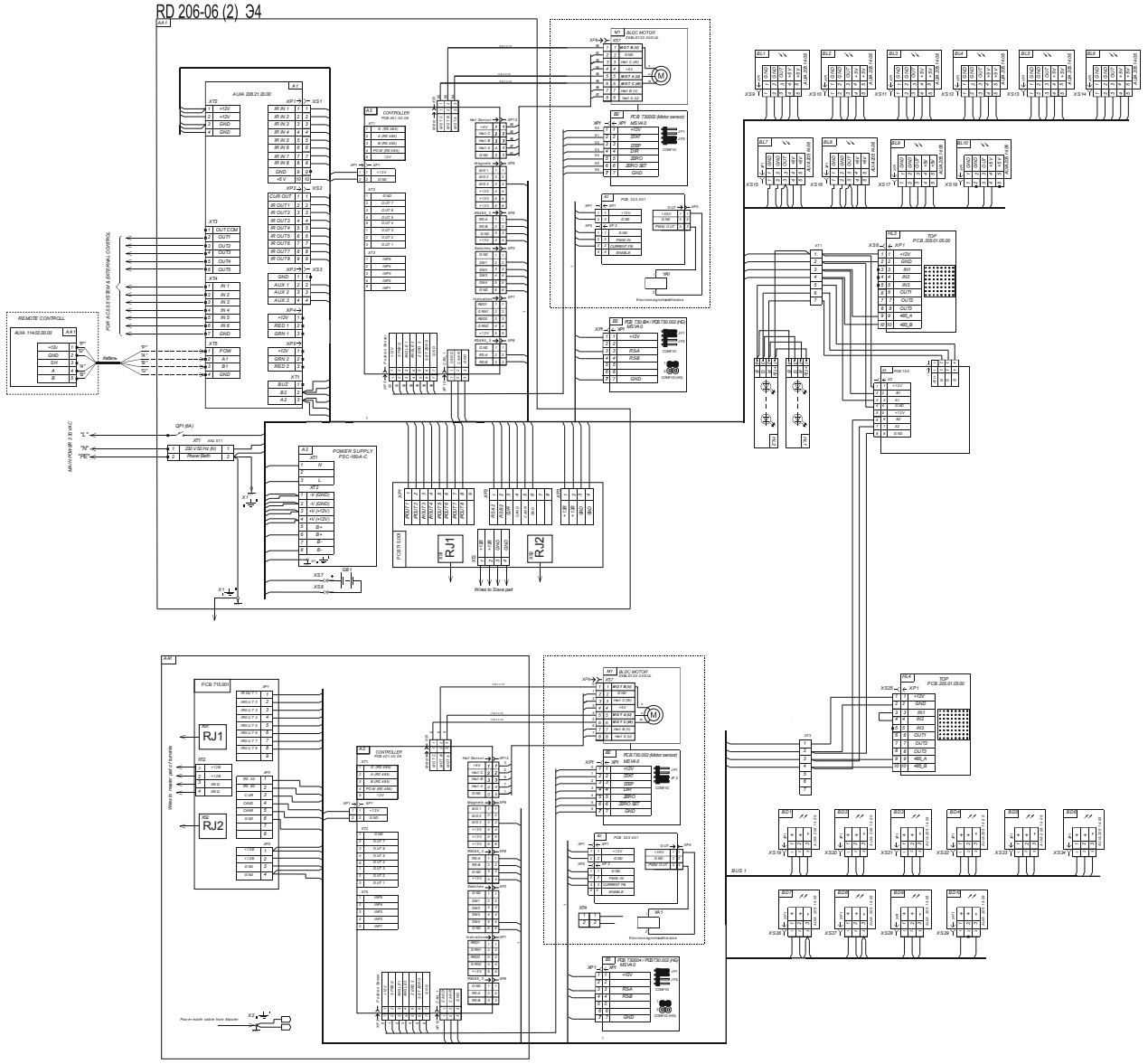
Annex C.1. **Wiring diagram of the Sweeper-BM 1.1 BLDC Master (AUIA.206-06) Rev 0.6**



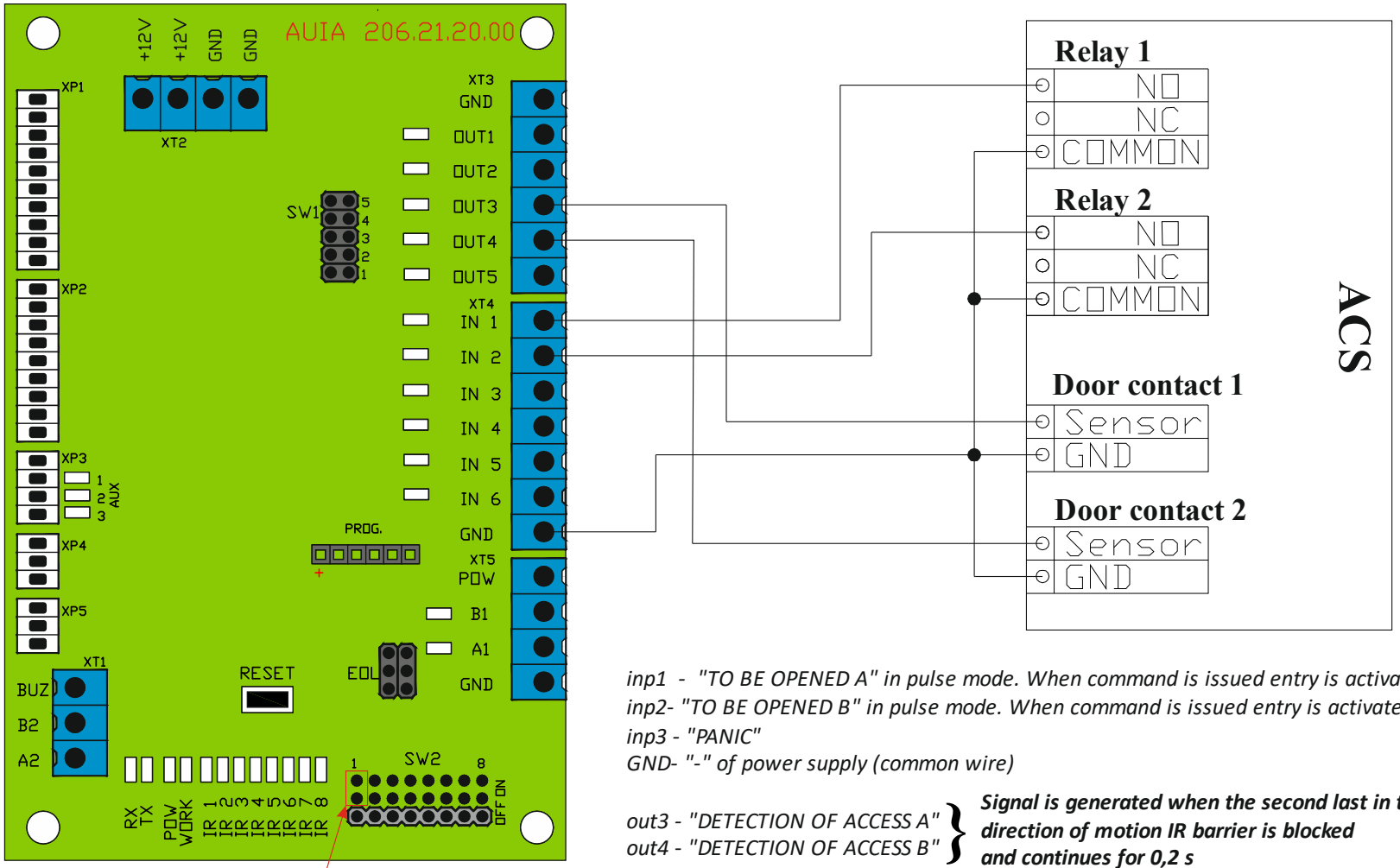
Annex C.2.**Wiring diagram of the Sweeper-BM 1.2 BLDC Slave (AUIA 206-06) Rev 0.6**



Annex C.3 **Wiring diagram of the Sweeper-BM 2 BLDC Master/Slave (AUIA 206-06) Rev 0.6**



Annex D.1. **Diagram of the turnstile connection to access control system (ACS)**



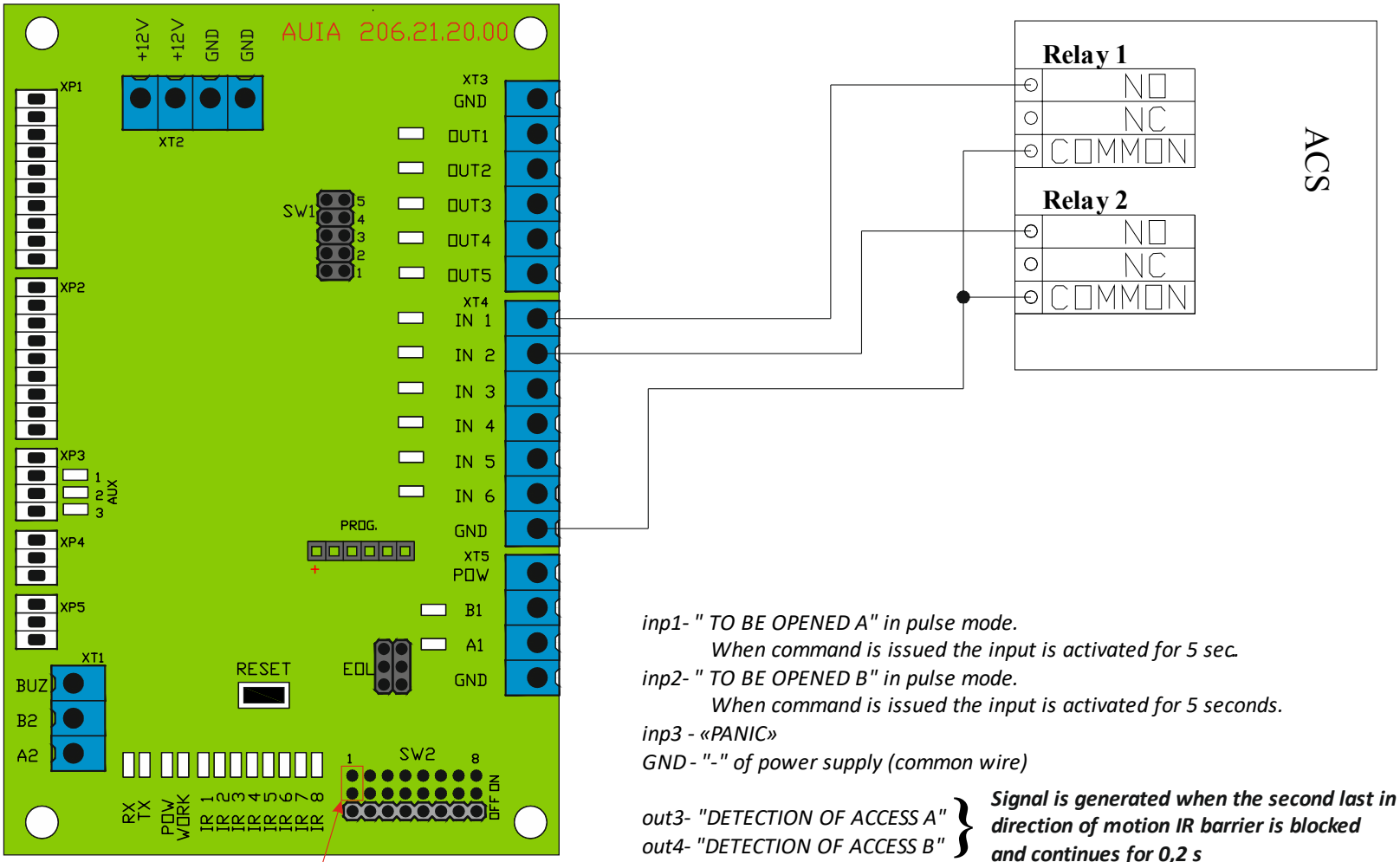
IN1 and IN2 with 5 sec. delay

inp1 - "TO BE OPENED A" in pulse mode. When command is issued entry is activated for 5 se
inp2- "TO BE OPENED B" in pulse mode. When command is issued entry is activated for 5 sec.
inp3 - "PANIC"
GND- "-" of power supply (common wire)

out3 - "DETECTION OF ACCESS A"
out4 - "DETECTION OF ACCESS B"

Signal is generated when the second last in the direction of motion IR barrier is blocked and continues for 0,2 s

Annex D.2. **Diagram of the turnstile connection to access control system (ACS)**



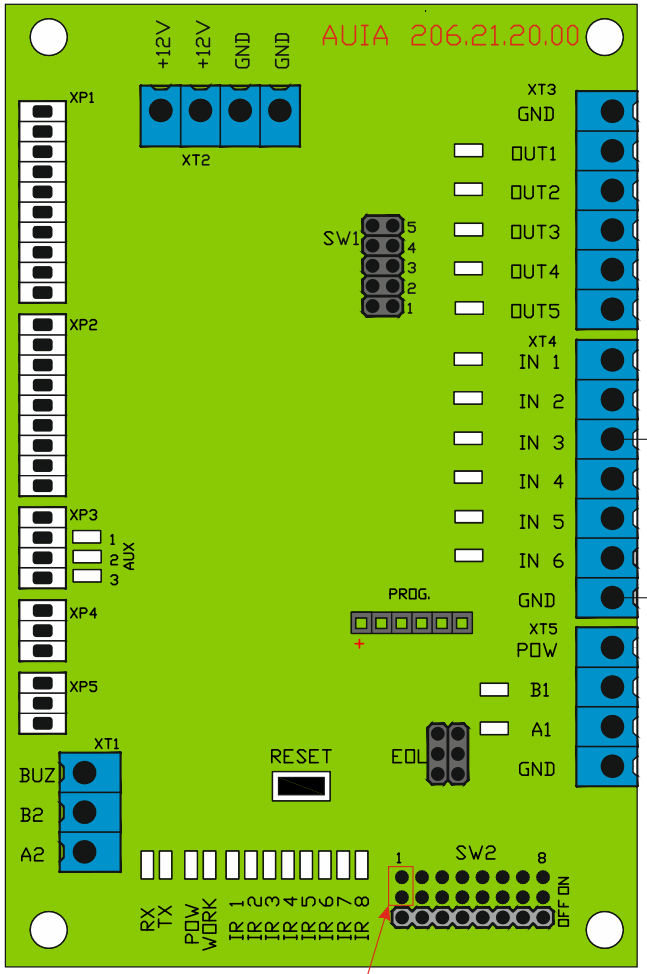
IN1 and IN2 with 5 sec. delay

inp1- " TO BE OPENED A" in pulse mode.
When command is issued the input is activated for 5 sec.
inp2- " TO BE OPENED B" in pulse mode.
When command is issued the input is activated for 5 seconds.
inp3 - «PANIC»
GND - "-" of power supply (common wire)

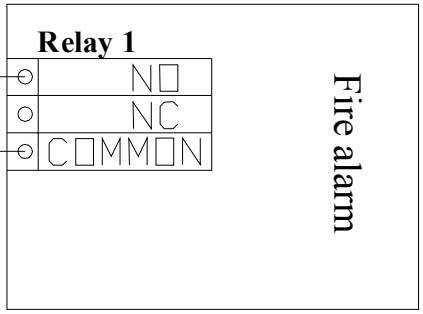
out3- "DETECTION OF ACCESS A"
out4- "DETECTION OF ACCESS B"

Signal is generated when the second last in the direction of motion IR barrier is blocked and continues for 0,2 s

Annex D.3 **Diagram of the turnstile connection to fire alarm (FA)**



IN1 and IN2 with 5 sec. delay

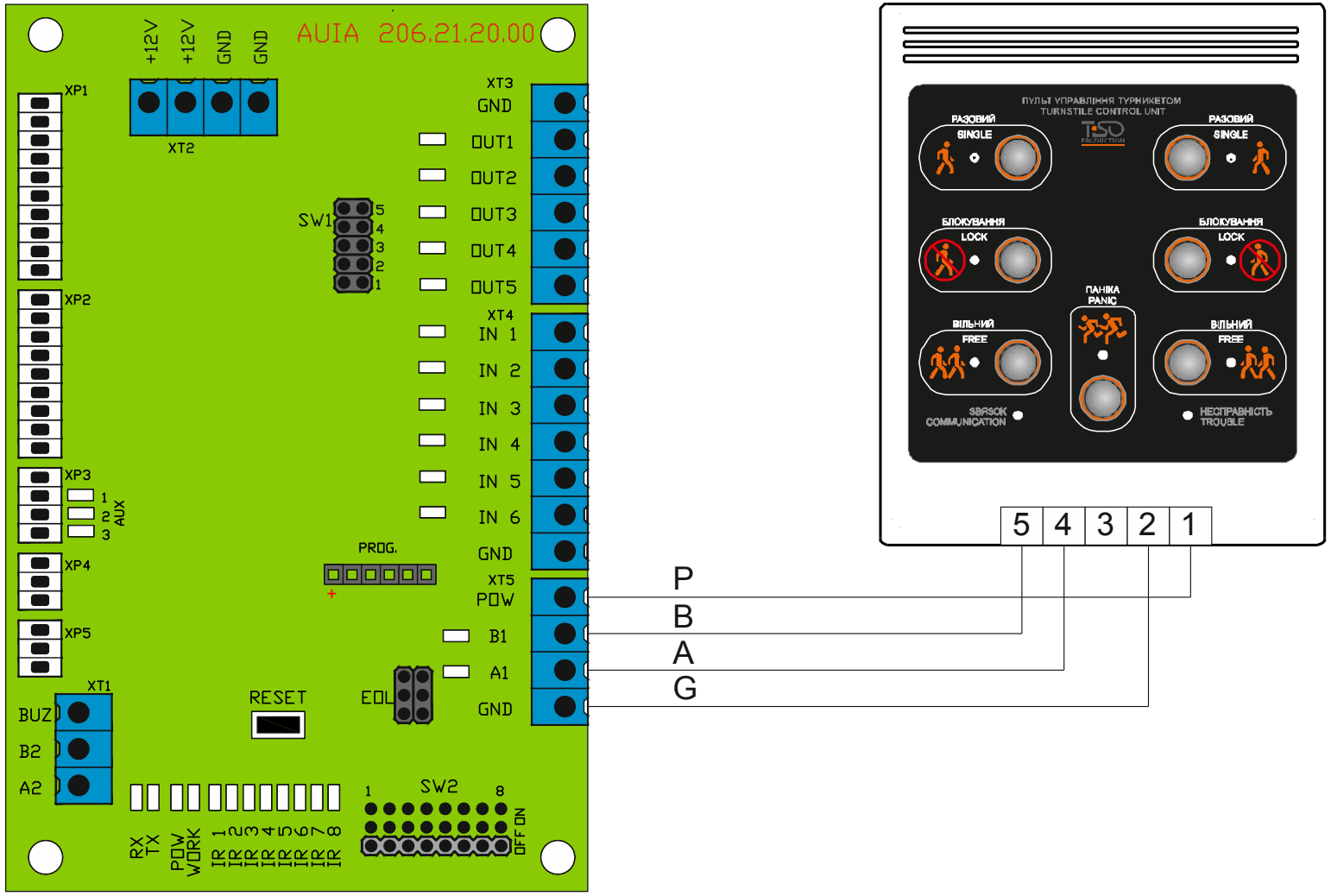


inp1- " TO BE OPENED A" in pulse mode. When command is issued the input is activated for 5 sec.
inp2- " TO BE OPENED B" in pulse mode. When command is issued the input is activated for 5 seconds.
inp3- «PANIC»
GND- "-" of power supply (common wire)

out3- "DETECTION OF ACCESS A"
out4- "DETECTION OF ACCESS B"

} *Signal is generated when the second last in the direction of motion IR barrier is blocked and continues for 0,2 s*

Annex D.4 **Diagram of the turnstile connection to control panel**



Manufacturer:
LLC TiSO-PRODUCTION
14, Promyslova Street, Kyiv, 02088, Ukraine
Phone: +38 (044) 291-21-11
Tel./fax: +38 (044) 291-21-02
E-mail: sales@tiso.global
WEB www.tiso.global

SERVICE CENTER
e-mail: service1@tiso.global

Our equipment meets the requirements of European standards:
EN ISO 12100:2010, EN ISO 14118:2018, EN 60204-1:2018,
EN ISO 13857:2019, EN 61000-6-1:2007, EN 61000-6-3:2007/A1:2011/AC:2012
and meets the requirements of the following EU Directives:
2014/30/EU; 2014/35/EU, 2006/42/ EC

The manufacturer's quality management system is certified according to the international standard ISO 9001:2015 - Certificate № UA 18 / 819942484.

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