

## **TECHNICAL MANUAL**

Translated from the French original notice

(rev 22)

## Document revisions

Revision	Date	Written	Checked	Nature
00	2008.04.11	CP	J.B.	First edition.
01	2008.06.20	CP	J.B.	Installing the canopies.
02	2008.07.25	CP		<ul style="list-style-type: none"> <li>• Installation on finished floor.</li> <li>• Fastening the rotor on upper and lower flanges.</li> <li>• Replacement of the electric diagram.</li> <li>• Control board: adaptation to program version 3.0 (management of lighting by light sensor).</li> <li>• Technical specifications: control circuits 24 VDC instead of 24 VAC.</li> </ul>
03	2009.01.06	MFy		<ul style="list-style-type: none"> <li>• Division of TRS 37x manual in 3 distinct manuals &amp; general update.</li> <li>• Modification of the nominal power consumption.</li> </ul>
04	2009-03-17	MFy		<ul style="list-style-type: none"> <li>• Ch.2.3. + 2.4. : modification of the chronology (plan the conduits at the start).</li> </ul>
05	2009-06-22	MFy		<ul style="list-style-type: none"> <li>• Ch.3.11. : adapted to version 4.0 of the program: - "Default LSA &amp; B" maintain the turnstile operational.</li> <li>• Addition of Modbus registers (refer to AS1300 Technician manual).</li> </ul>
06	2009-06-24	MFy		<ul style="list-style-type: none"> <li>• Ch. 2.4. : Drawing CH6728 ► rev A (modification of cables arrival).</li> </ul>
07	2009-06-25	MFy		Adapted to standard model 2009: <ul style="list-style-type: none"> <li>• Orientation pictogram as standard.</li> <li>• LED lighting for passageway as standard.</li> <li>• Dust-free seal as standard.</li> <li>• "Intermediate lockage" option suppressed.</li> </ul>
08	2009-11-17	Mfy		<ul style="list-style-type: none"> <li>• Packing list suppressed (provided with the TRS).</li> <li>• Ch.2.5. : assembly elements reference added.</li> <li>• Ch.2.5.2. : Entry direction reversed on drawing.</li> <li>• Ch. 2.5.10. : retaining ring suppressed.</li> <li>• Ch.3.11. : highlighted most common functions =&gt; bold to increase readability.</li> </ul>
09	2009-11-24	MFy		<ul style="list-style-type: none"> <li>• Ch.2.5.10. : close by means of a special plug.</li> </ul>
10	2010-01-05	MFy		<ul style="list-style-type: none"> <li>• EC certificate update.</li> </ul>
11	2010-01-07	MFy		<ul style="list-style-type: none"> <li>• Electrical diagram (rev F): optional heating resistance added.</li> </ul>
12				-
13	2010-10-29	MFy		<ul style="list-style-type: none"> <li>• Chapters added:               <ul style="list-style-type: none"> <li>◦ Fixing the box for card reader integration.</li> <li>◦ Power failure mode.</li> <li>◦ Heating resistance</li> </ul> </li> </ul>
14	2010-12-15	MFy		<ul style="list-style-type: none"> <li>• Ch.2.5.8: fixing screws of the mobile comb to be glued replaced by coated screws (DIN 933 M12).</li> <li>• Ch.3.8 + 3.11 + 6.1: heater connections detailed.</li> <li>• Ch.3.9.3: mode 5 to mode 4 conversion added.</li> </ul>
15	2011-04-13	MFy		<ul style="list-style-type: none"> <li>• Ch.2.5.9: heel gard fixation modified.</li> </ul>
16	2012-03-14	MFy		<ul style="list-style-type: none"> <li>• Reinforcement spacers added =&gt; ch.2.2. + 2.3. + 2.5.6. adapted.</li> <li>• Ch.2.5.9. : flat and tooth lock washers replaced by Nordlock ones.</li> <li>• Ch.2.3. + 2.4. : installation drawings ⇒ rev A .</li> <li>• Ch.3.11. : shortcut for language selection suppressed.</li> <li>• Ch.4. : lubricate the bolt pivot.</li> </ul>
17	2012-03-23	MFy		<ul style="list-style-type: none"> <li>• Ch. 2.2. +2.5.6. : drilling Ø corrected.</li> </ul>
18	2013-02-22	MFy		<ul style="list-style-type: none"> <li>• Electrical diagram (rev H): C20 to C23 function chart corrected (A/B)</li> </ul>

19	2013-03-13	MFy	-	<ul style="list-style-type: none"> <li>• Ch.2.5.10. Heel guard modified.</li> </ul>
20	2016-03-07	SLu	-	<ul style="list-style-type: none"> <li>• Ch.4.</li> <li>• Ch.2.5.8 Add note for workshop.</li> </ul>
21	2016-05-02	SLu	-	<ul style="list-style-type: none"> <li>• Adjust level of revision.</li> <li>• CE declaration of conformity updated.</li> </ul>
22	2019-07-02	JB		EC declaration of conformity updated and maintenance program updated to reach the MCBF

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# 1. SAFETY WARNINGS

- This manual must be made available to everyone working on the equipment: installer, maintenance operator, end user...
- This equipment is solely intended to control pedestrian access. Operating it for any other purpose entails risks for the user and may jeopardize the integrity of the equipment. Automatic Systems' responsibility may not be invoked for damages resulting from an inappropriate use of the equipment. Especially, the turnstile is not intended for:
  - People with reduced mobility.
  - Unaccompanied children.
  - Managing a continuous flow of more than twenty (20) people per minute.
- This equipment must not be installed in an explosive area.
- Do not add accessories that are not original equipment or that have not been approved by the manufacturer (contact between different metals may cause galvanic corrosion that can accelerate the deterioration of the equipment).
- The contractor must respect all local standards and regulations when installing the equipment.
- All operations performed on the equipment must be undertaken by qualified personnel. All operations that are not authorized or that are carried out on this product by an unqualified technician shall automatically invalidate the manufacturer's warranty.
- Access to mechanism must be limited to personnel informed of the electrical and mechanical risks incurred by negligent handling. Access door to mechanism must be locked after every operation performed.
- Ensure to switch off the electrical power supply on the circuit breaker (ch. 2.6. ) when opening the housing.
- The equipment is configured in a "minimal risk" mode for its users. All modifications of the parameters must be undertaken by experienced and qualified personnel and in no way entail the responsibility of Automatic Systems.

## 2. INSTALLATION

### 2.1. EQUIPMENT STORAGE BEFORE INSTALLATION

Prior to installation, be careful to avoid all physical shocks to the equipment. Keep it in its original packaging and store it in a dry location. Make sure it is protected from dust, heat and harsh weather. Extreme temperatures of storage: -30 to +80°C.

### 2.2. LIST OF TOOLS REQUIRED

- Wrench set.
- Ratchet set.
- 500 g hammer.
- Percussion drill + drill bits Ø12x100 (for reinforcement spacers fixation)  
+ drill bits Ø15x100 (if fixed to the ground with template).
- Spirit level.
- Forklift.
- Application gun for the adhesive cartridge (heel guard option):



•

## 2.3. INSTALLATION ON FINISHED GROUND SURFACE (WITH TEMPLATE)

**A2**

**TEMPLATE POSITIONING**  
ARTICLE N° GAB-E-000772 & GAB-E-000774

ARRIVÉE DES CABLES AU CHOIX

**ARRIVÉE DES CABLES AU CHOIX**

- Position both template with regard to the entry direction
- 2 cables entry points are available (max. 025mm)
- Mark points ①
- When the TRS has been installed, drill Ø12 through the holes for the stability kit ②

**POWER SUPPLY:** Single phase 230V + ground with 3Ø2,5 + mm (Type: XPVB recommended)  
Control cable type : TPVF ou LYCY

PVC tube: 2xØ25mm for cables

**WARNING:** If control cables are not of TPVF or LYCY type foresee a supplementary tube to separate power supply from control cables

**ALL CABLES TO BE SUPPLIED WITH A MINIMUM 3 METRE FREE TAIL**

**A-A' SECTION**  
B - DIRECTION EXIT  
A - DIRECTION ENTRY

② REINFORCED STABILITY KIT FOR TRS371

② REINFORCED STABILITY KIT FOR TRS371

<b>A</b>	<b>AJOUT KIT RENFORT + ARRIVÉE DE CABLE Ø50 -&gt; 2xØ25</b>	<b>CF</b>	<b>07/10/2011</b>		
INDICE :	MODIFICATIONS :	PAR :	DATE :		
ANNUISANT :	MUTZUGENGEN :	DOOR :	DATUM :		
DESIGNATION :	<b>TRS371 - INSTALLATION WITH TEMPLATE</b>				
BESTEMMING :					
CLIENT :					
PLANT :					
<small>Les dimensions sont données en millimètres et décimales de millimètre. Les dimensions sont données en pouces et fractions de pouce.</small> <small>We give measures in inches and fractions of an inch.</small> <small>Alle Maße sind in Zoll und Bruchteilen des Zolls angegeben.</small>			DESIGNE :	DATE :	N° DOSSIER :
			GEEKEND :	DATE :	N° DOSSIER :
			VERIFIE :	ECHELLE :	PLAN N° :
			NAGEZIEN :	SCHAAL :	PLAN N° :
			<b>FM</b>	<b>1/20</b>	<b>CH6761-gb</b>
Avenue Mercator, 5 - B-1300 Wavre www.automatic-systems.com					

1. Plan in advance the installation of the conduits for the passage of cables and remote control devices, as set out in the implementation drawing.  
Remember that the cables ends must extend 3 metres above ground level, electrical connections being done in the upper section of the full-height turnstile.
2. Ensure that the surface on which the full-height turnstile is to be installed is perfectly flat (without any irregularities) and made of concrete or other non inflammable material.
3. Following the instructions presented in the Installation Drawing, use your drilling template to mark the location of the various drilling holes.
4. If you chose to use the anchoring bolts provided by Automatic Systems, bore holes that have a diameter of 15 mm and are 85 mm deep into the surface.

**Caution:** Although the anchoring bolts provided by Automatic Systems are compatible with most configurations, the complete fixing process must be adapted to the environment and nature of the ground on which the full-height turnstile is to be installed. All civil work must be approved and validated by an engineer knowledgeable on the matter.

**The equipment must be fixed to the ground prior to being used!**

Automatic Systems cannot be held responsible for accidents or damages resulting from a faulty anchoring installation.

5. Put the anchoring bolts (21) in place. Pre-tighten the nuts so as to fix the expanding anchoring bolt into the ground. Proceed then to remove the nuts previously tightened in order to be able to install the fixing brackets later on.



21

6. The fixed panel stability will have to be reinforced by means of spacers (cf. ch.2.5.6. ).



## 2.4. INSTALLATION WITH FIXING FRAME (OPTION)

**A2**

**DISTANCES TO RESPECT AFTER FIXING FRAME INSTALLATION**  
ARTICLE N° GBR E-0004283

**POWER SUPPLY:** Single phase 230V ~ 4. grounded with RG2.5 mm (Type: XFVB recommended)  
Control cable Type: TPVF ou LYCY.

**PVC tube:** Ø50mm for cables

**WARNING:** If control cables are not of TPVF or LYCY type foresee a supplementary tube to separate power supply from control cables

**ALL CABLES TO BE SUPPLIED WITH A MINIMUM 3 METRE FREE TAIL**

Les dimensions sont données en millimètres (sauf mention contraire)  
All dimensions are given in millimeters (unless otherwise stated)

Ne pas modifier sans avis préalable de Automatic Systems  
Do not modify without prior notice from Automatic Systems

INDEX / ANNULATION / WIZJINGEN:	CP	DATE / DATUM:	24/06/2009
DESIGNATION / BESTEMMING:	ARRIVÉE DES CABLES MODIFIÉE / MODIFICATIONS / WIZJINGEN:	PAR / DOOR:	
CLIENT / KLANT:	<b>TRS371 - INSTALLATION WITH FIXING FRAME</b>		

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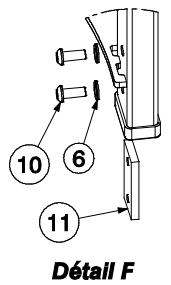
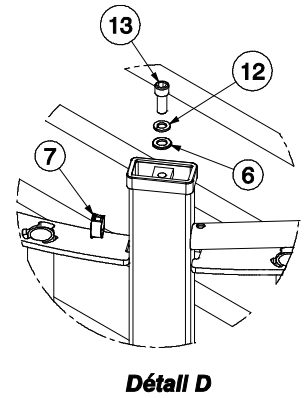
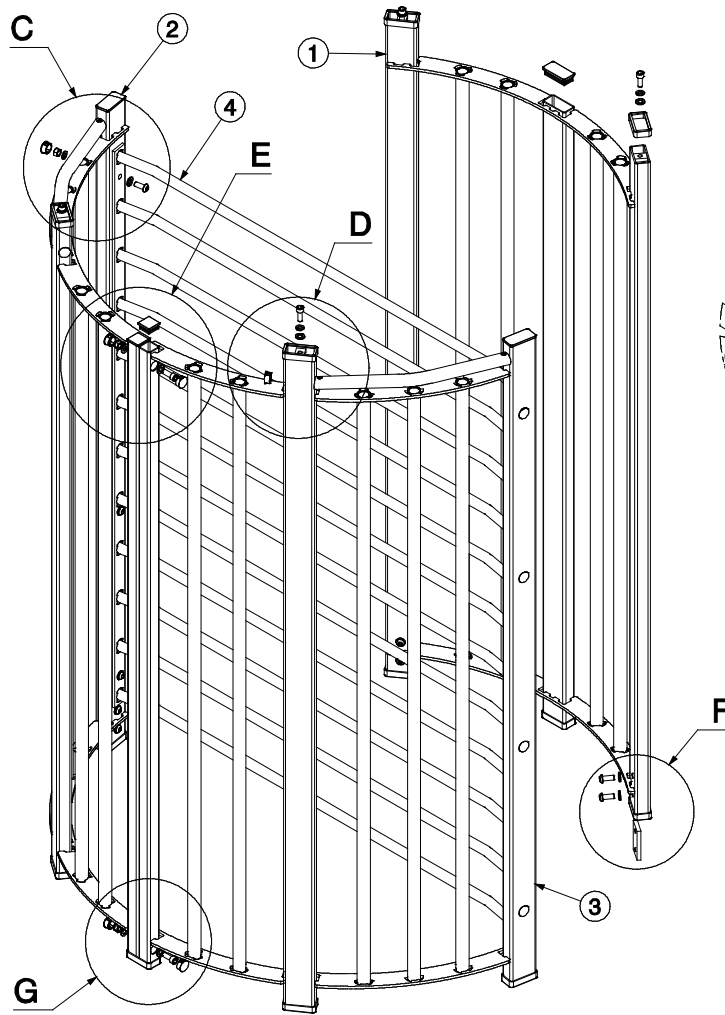
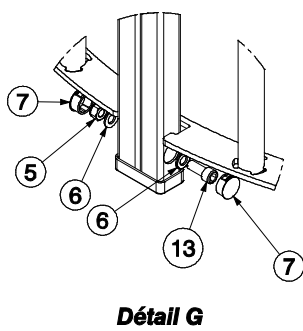
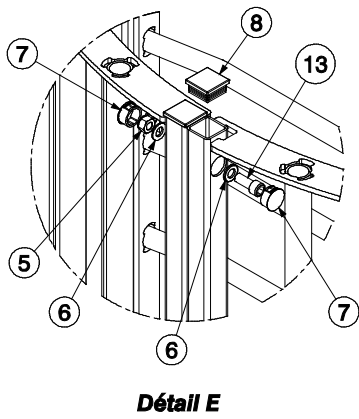
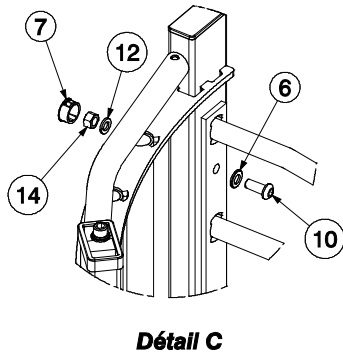
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Following the instructions presented in the implementation drawing:

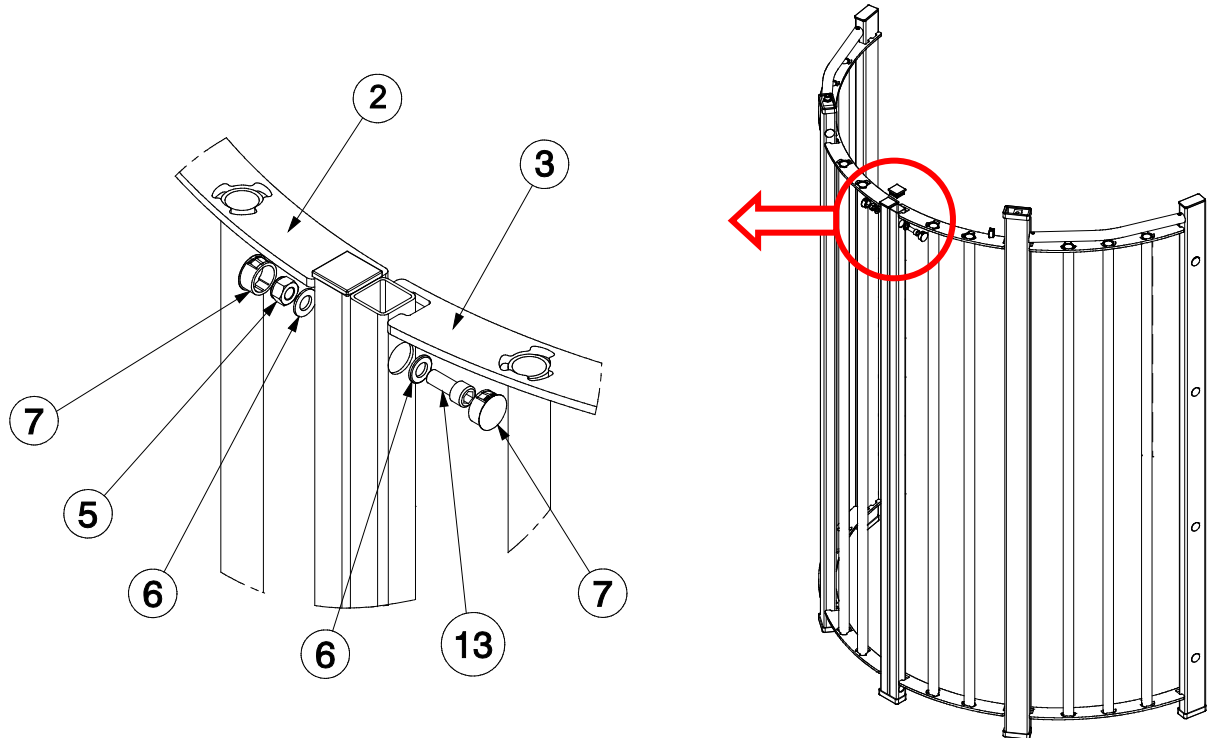
1. Plan in advance the installation of the conduits for the passage of cables and remote control devices. Remember that the cables ends must extend 4 metres above ground level, electrical connections being done in the upper section of the full-height turnstile.
2. Dig a hole in the ground for the installation of the concrete slab.
3. Using the hardware provided, assemble the various parts of the fixing frame.
4. Verify the interaxial spacing between the different crossbars of the fixing frame.
5. Place the fixing frame in the hole you have just dug:
  - Ensuring that you follow the direction of passage.
  - Making sure that you run the conduits for the cables and remote control devices through the uprights to be installed.
  - Verifying that the fixing brackets are buried in the ground as indicated in the implementation drawing (the painted part of the brackets must be left unburied).
6. Pour standard concrete in the hole, making sure to smooth it out.
7. Leave to dry for about one week.

## 2.5. TURNSTILE ASSEMBLY



### 2.5.1. Fixed panel assembly (detail E)

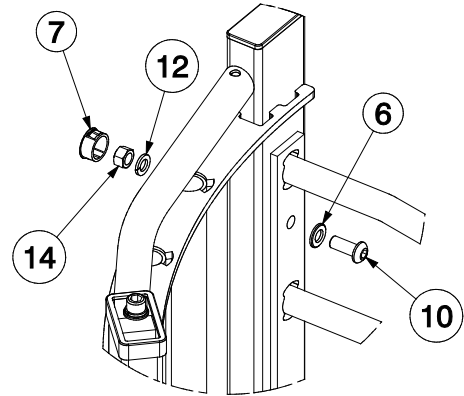
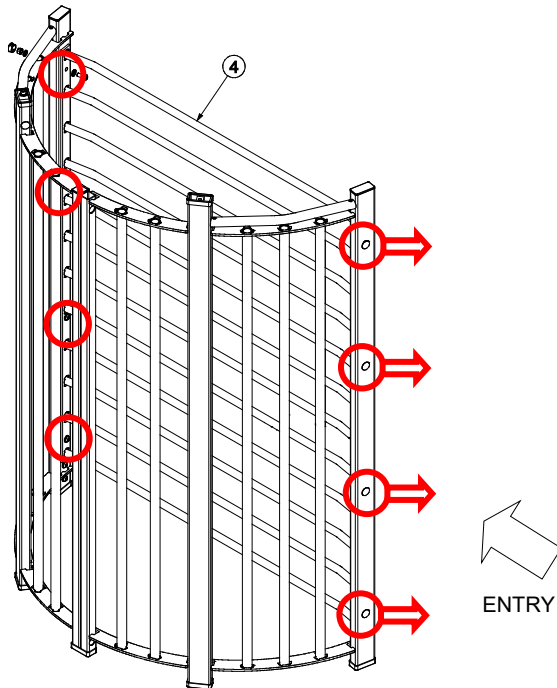
Assemble the left and right curved parts.



- 2. *Right curved part*
- 3. *Left curved part*
- 5. *Nut DIN 985 M12*
- 6. *Flat washer DIN 125 M12*
- 7. *Plug (Ø 30.9)*
- 13. *Screw DIN 912 M12 x 30*

## 2.5.2. Fastening the fixed comb to the fixed panel (detail C)

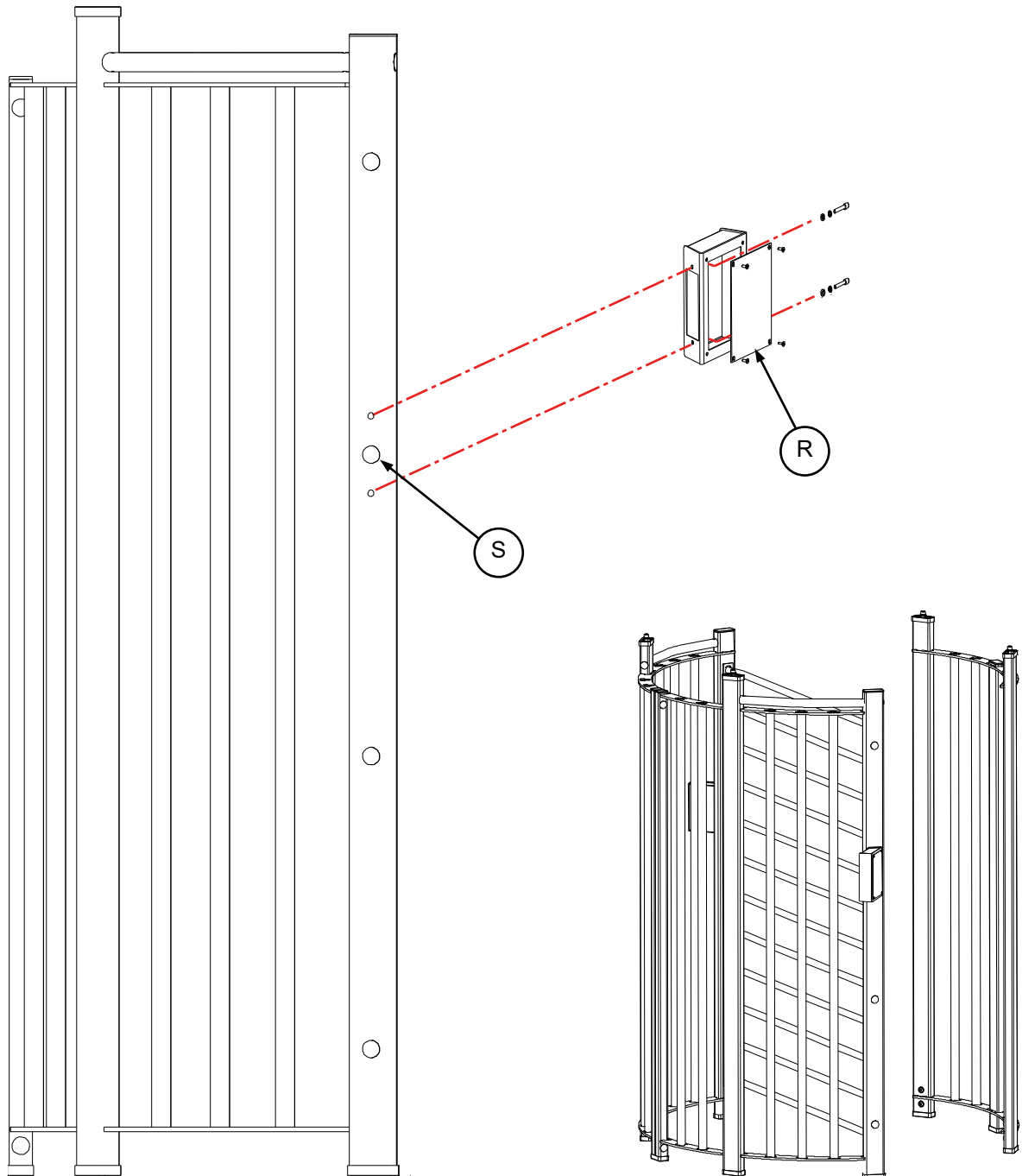
- Fasten the fixed comb (4) to the left side of the fixed panel (8x).
- The fixed comb is to the left in the direction of entry, cf. implementation drawing.



4. Fixed comb
6. Flat washer DIN 125 M12
7. Plug (Ø 30.9)
10. ½ round head screw M12 x 30
12. Grower washer DIN 127 M12
14. Nut DIN 934 M12

### 2.5.3. Fixing the box for card reader integration (option)

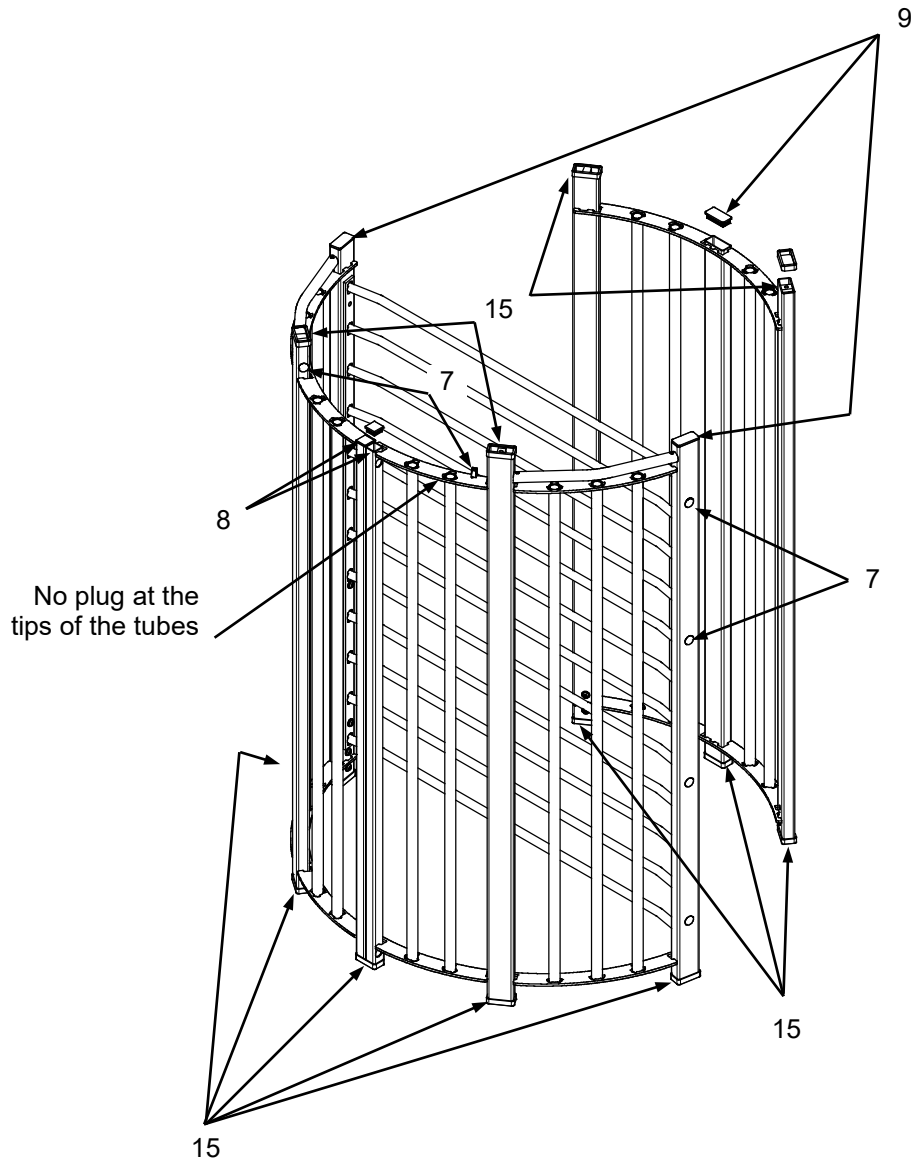
- Unscrew front face (R) of the box.
- Fix the box to the fixed panel upright by means of the provided screws and washers.
- Pass the electric cables through hole (S) and bring them towards the upper part of the upright: the reader will be connected to the control board (cf. electric diagrams) located in the upper box.
- Fit the reader into the box, connect it to the electric cables and close the box..



## 2.5.4. Plugs installation

- Install the upright protectors (15) on the lower ends of the uprights holding the fixed panel, as well as the upper parts of the 4 supports for the upper box section (the highest ones).
- Close the upper parts of the remaining uprights by means of the plugs provided (8) and (9).
- Once the whole structure is firmly fixed to the ground, (cf. next chapter), proceed to block out the lateral openings with the plugs (7).

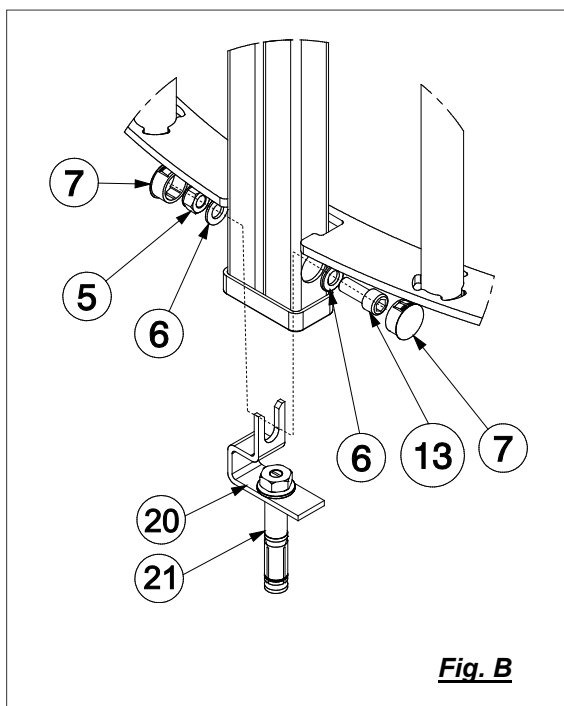
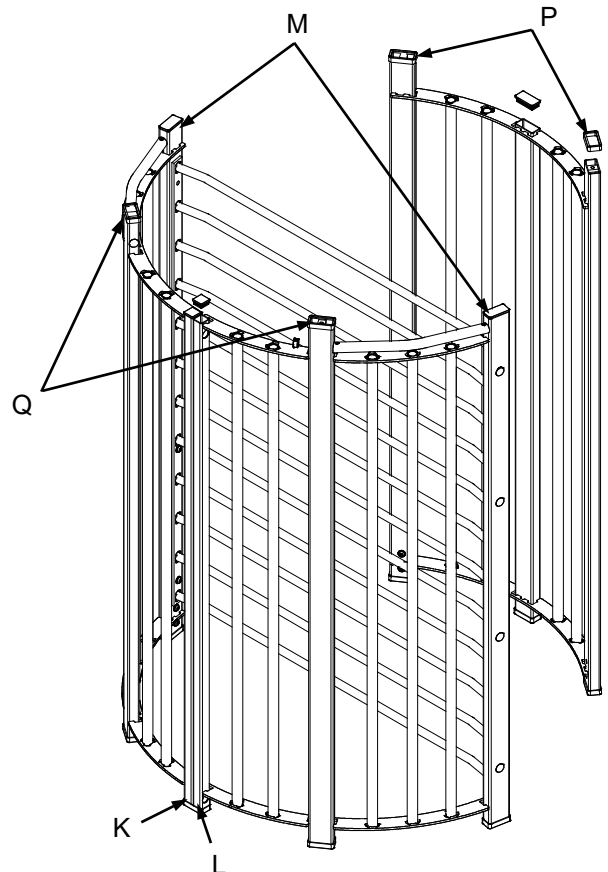
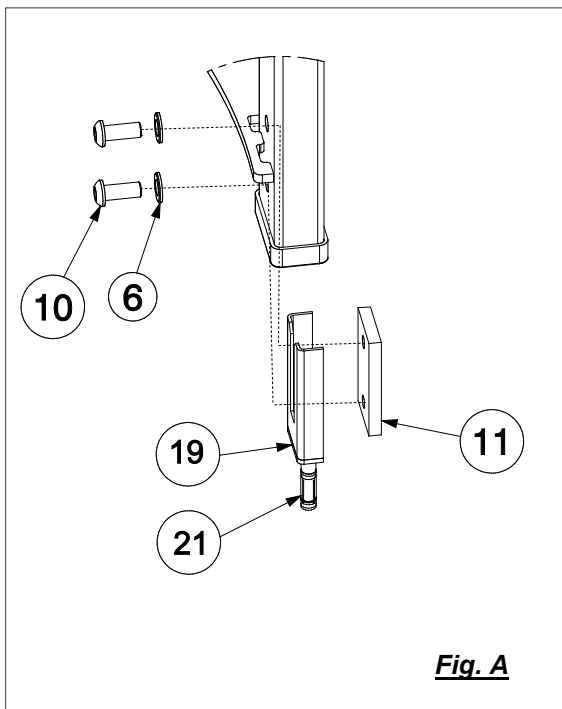
**Note:** The tips of the fixed panel vertical tubes must stay open.



- 7. Plug ( $\varnothing$  30.9)
- 8. Square plug
- 9. Rectangular plug
- 15. Upright protector

## 2.5.5. Fixing the turnstile to the ground (details F+G)

- Fix the brackets (19) and (20) to the anchoring bolts (21) (cf. implementation drawing, ch.2.3. ). If fixing to the fixing frame (option) they are an integral part of it.
  - Run the electric cables through the uprights (P) and (Q).
  - Proceed then to close the uprights (M) and (P) and fix them as shown in fig. A: start by inserting the bolts (10) and washers (6) through the upright, in the fixing clamp (11). Place the upright on the fixing bracket (19) and tighten the bolts.
- Note:** In order to prevent corrosion, ensure that the uprights do not come in direct contact with the concrete.
- Fix the central uprights (K) and (L) as indicated in fig. B.



- 5. Nut DIN 985 M12
- 6. Flat washer DIN 125 M12
- 7. Plug (Ø 30.9)
- 10. 1/2 round head screw M12 x 30
- 11. Ground fixing clamp
- 13. Screw DIN 912 M12 x 30
- 19. Fixing bracket
- 20. Fixing bracket
- 21. Anchoring bolt B15/30



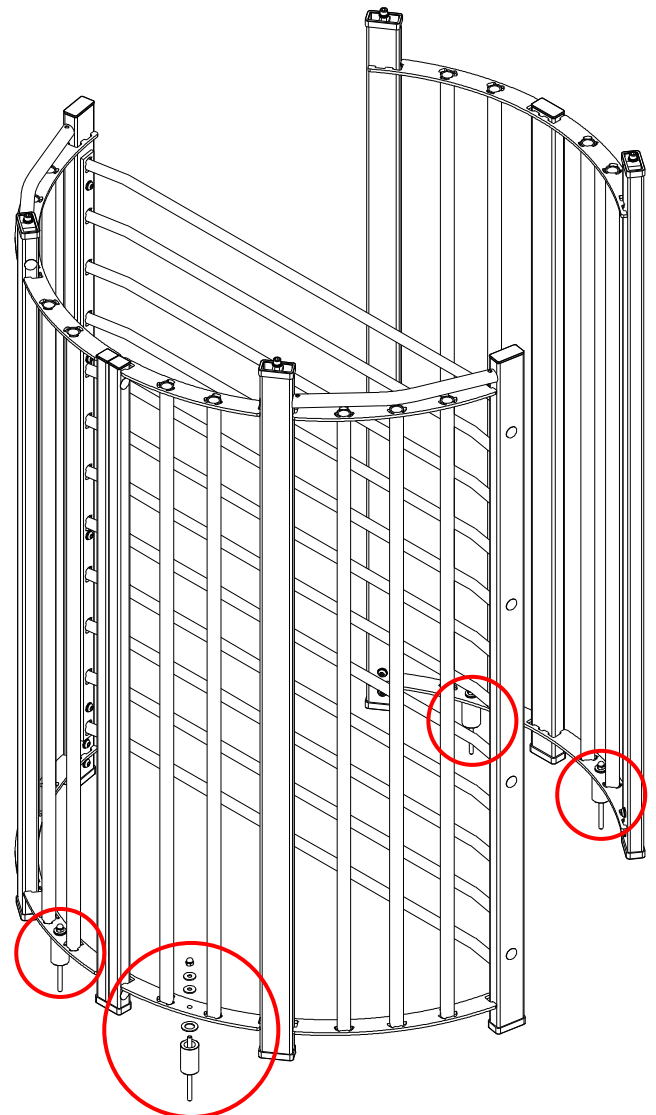
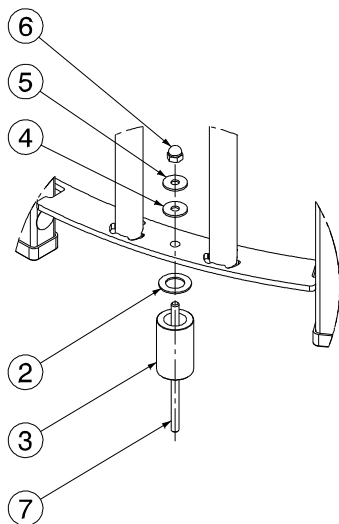
## 2.5.6. Fixing the reinforcement spacers

**Only** for TRS371 installed on finished ground (with template), the stability of the fixed panel assembly must be reinforced by means of 4 spacers:

- Drill in the ground 4 holes  $\varnothing 12$  mm - 100 mm depth through the holes of the curved parts (also marked ② on the installation drawing of ch.2.3. ).
- Clean the holes by blowing and fill them with fixation mortar (WIT – C150 supplied). Respect the implementation time of the mortar (cf. column 2 of the here under chart).
- Plunge the threaded rod into the mortar and fix them to the curved parts as represented below.  
**Note:** take care that only the synthetic washers are in contact with the metallic curved parts.
- Allow proper curing time for the mortar (cf. column 3 of the here under chart).

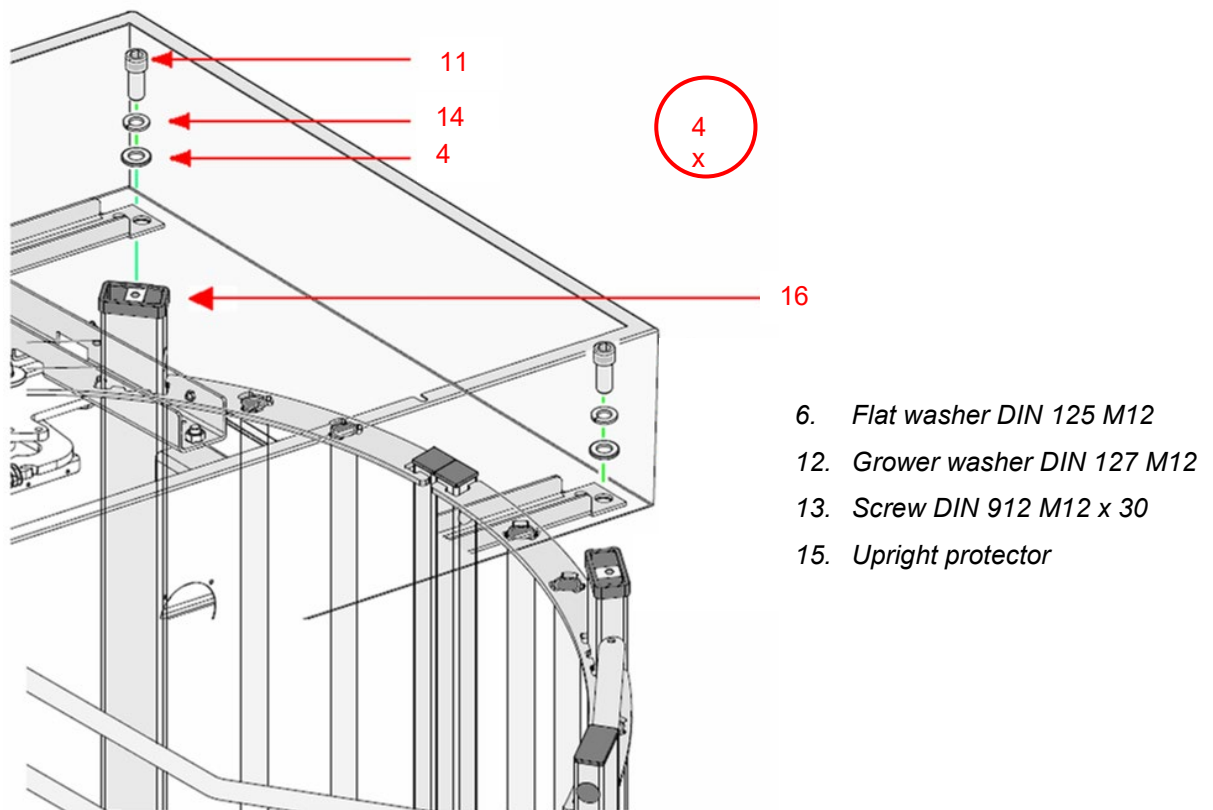
Implementation of the mortar		
Ambiant t°	Implementation delay after opening the cartridge	Curing time
+ 5°C	25 min	120 min
+10°C	15 min	80 min
+20°C	6 min	45 min
+30°C	4 min	25 min
+35°C	2 min	20 min

2. Nylon washer
3. Spacer
4. Polyamide washer
5. Stainless steel washer
6. Nut
7. Threaded rod M10



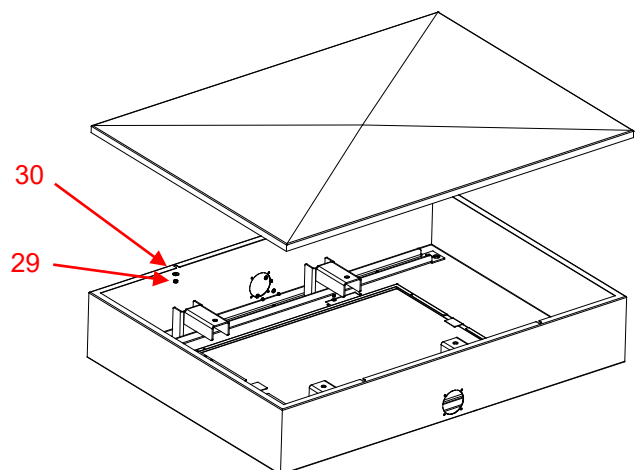
## 2.5.7. Upper box section assembly (detail D)

**Note:** The upper box section is of a significant weight and must be handled by at least two (2) people.



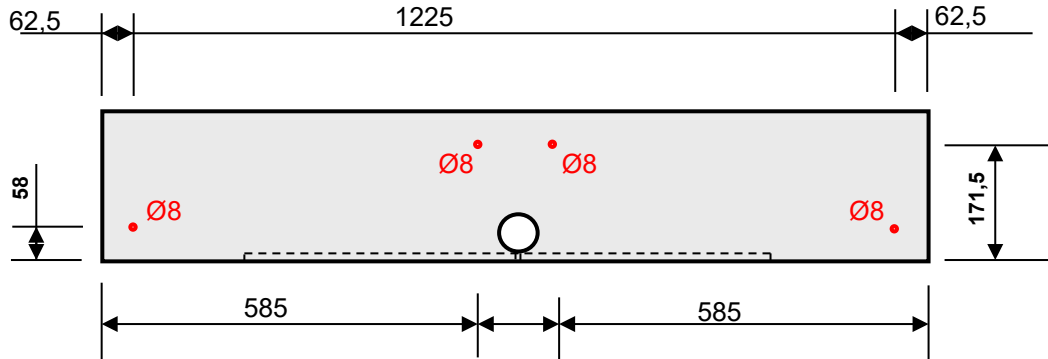
Fix the roof to the upper box section using nuts (29) and washers (30).

- 29. Nut DIN 985 M6
- 30. Large flat washer DIN 9021 M6

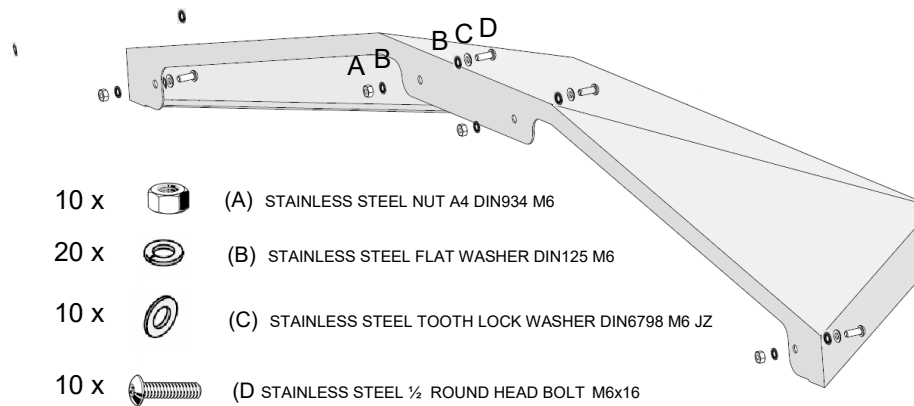


## 2.5.8. Canopy assembly (option)

**Step 1:** Drill four (4) 8-mm holes, on both sides of the upper box.

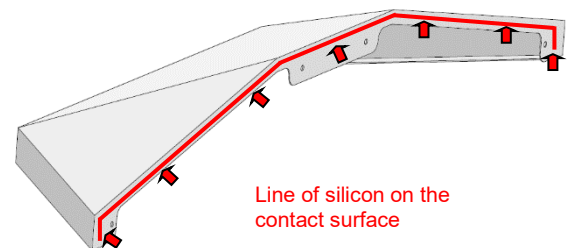


**Step 2:**



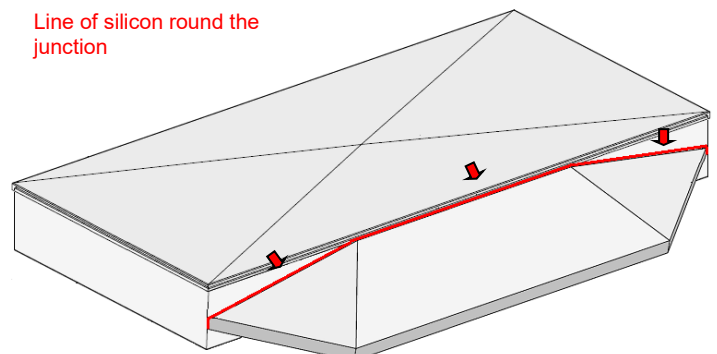
**Solution 1:**

- Put a line of silicon on the face that comes in contact with the upper box before fastening.
- Using the hardware provided, attach each canopy to the upper section.



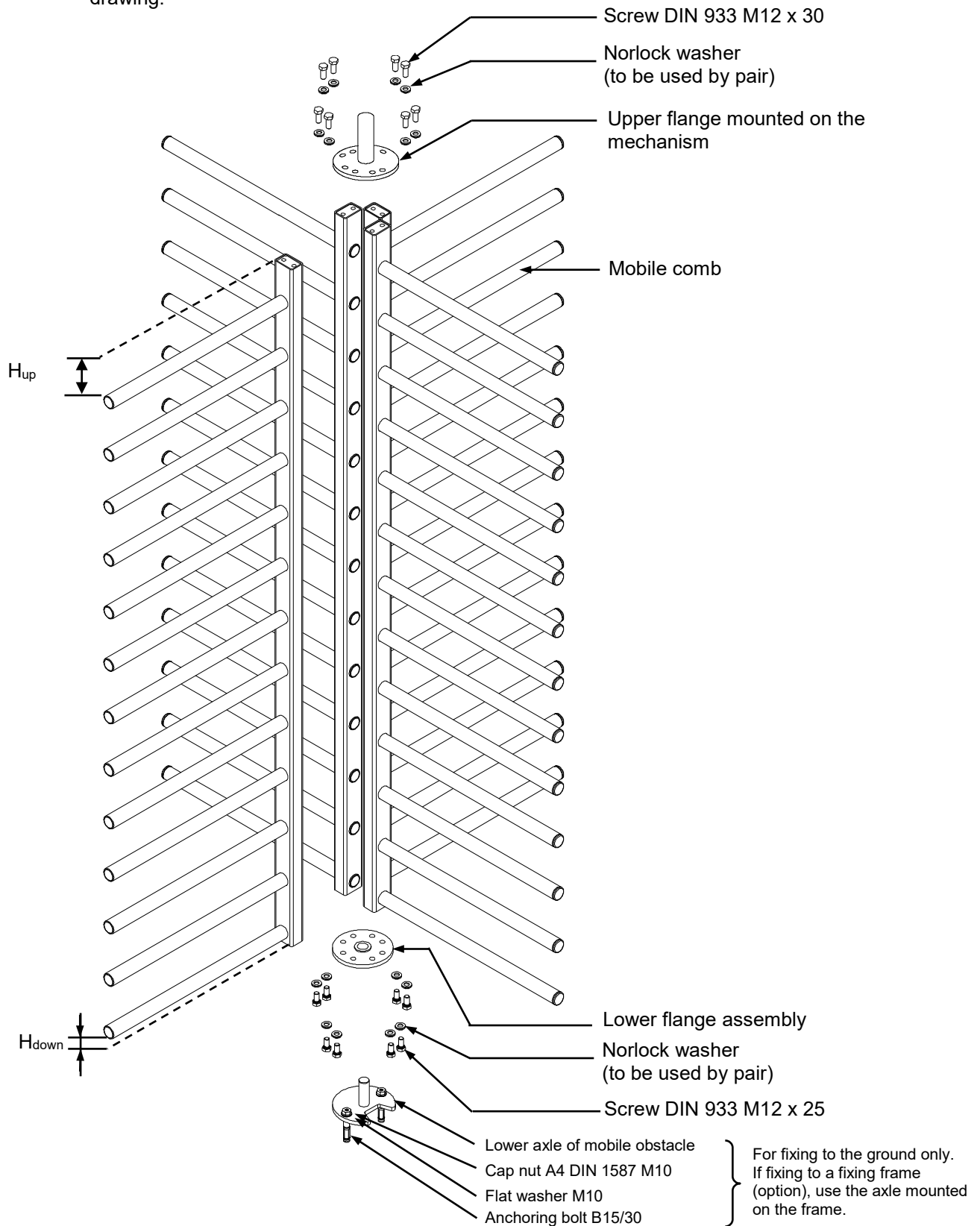
**Solution 2:**

- Using the hardware provided, attach each canopy to the upper section.
- Put a line of silicon at the junction where the canopy and upper box meet.



## 2.5.9. Mobile comb assembly

- Position the combs so as to have to lowest bar as close to the ground as possible (30 mm) ( $H_{up} > H_{down}$ ).
- Adjust the four mobile combs on the upper flange so as to close the passageway (cf. installation drawing).



## 2.5.10. Heel guard assembly (option)

**Note:** Automatic Systems provides one SIKAFLEX 221 adhesive sealant cartridge to fix the heel guard to the bar.

This adhesive must be applied at ambient temperatures between +5 and +40°C.

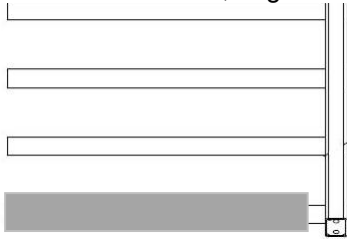
Once dry however, it resists to temperatures from -40 to +90 ° C.

The curing of the adhesive depends on its thickness and ambient temperature and may take several days when the latter is low.

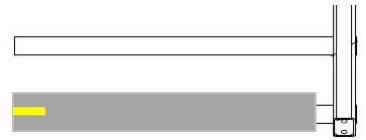
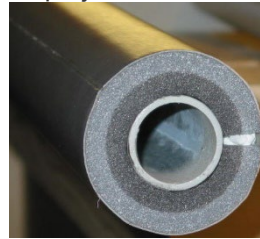
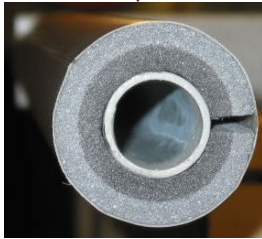
Cartridges must be used quickly once opened.

The adhesive is not resistant to organic acids, alcohol, concentrated mineral acids and caustic solutions or solvents.

1. For each mobile comb, decrease the lowest bar and insert the heel guard around it.



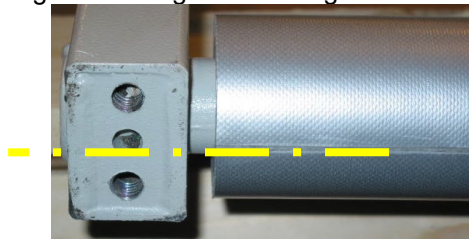
2. Insert the tip of the cartridge in the heel guard cut and project some adhesive, avoiding overflow.



3. Turn the heel guard to spread the adhesive around the bar.



4. Align the heel guard welding with the bottom of the comb.



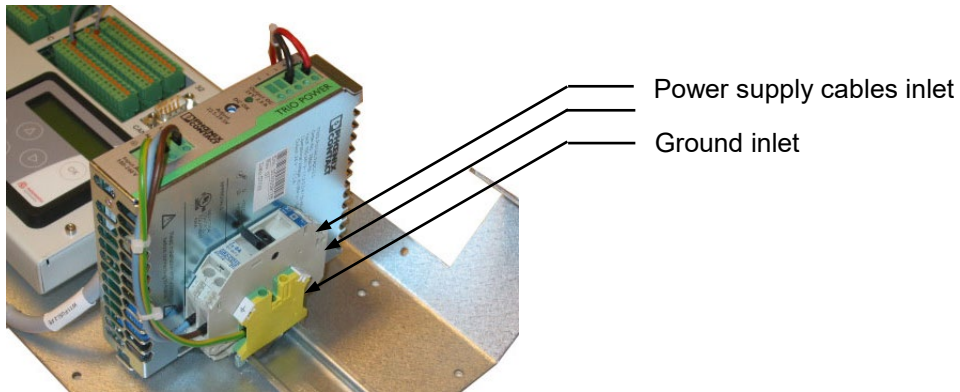
5. Let cure for 1 or 2 days, or longer if the ambient temperature is low.

## 2.6. ELECTRICAL CONNECTIONS

Power supply and command cables are provided by the user and are described in the implementation drawing.

If the command cables are different from the ones recommended, they must be separated from the power supply cables in order to avoid interferences. Thus, they must run through different uprights.

1. Connect the ground (single phase 120/230 VAC - 50/60 Hz) and the 2 phases of the power supply to the breaker.  
Protect the upstream line with a 16-A breaker.



2. Connect the options (card readers, etc.) according to the electrical diagrams.
3. Engage the circuit breaker.
4. Set the control board according to the added options ("OPTIONS" group).
5. Send a passage command and verify that the turnstile is working properly: unlocking, rotation of the obstacle, locking.

## 3. DESCRIPTION

### 3.1. TECHNICAL SPECIFICATIONS

- Rotating obstacle with 4 combs positioned at 90° to one another.
- Net weight: 404 kg (including x 90 kg for the upper box section).
- Power supply (only for a turnstile equipped with a control board): single phase 120/230 VAC - 50/60 Hz – Nominal power consumption: 70 W.
- AS1300 control board circuits: 24V DC
- Operating temperature: from -10 to +50°C.
- Max. relative humidity : 95%, no condensation.
- Mechanical locking of obstacle withstands a 1500 Nm torque.
- Flow: 15 to 20 passages per minute, depending on the reaction time of the reader.
- Obstacle goes back to its initial position in less than 1.5 seconds
- MCBF (mean cycles between failures), respecting the recommended maintenance: 3.000.000.
- MTTR (average repair time): 20 minutes.
- Surface treatment:
  - Galvanized internal mechanical parts.
  - Galvanized rotating obstacle, fixed comb and walls + 2 coats of pale grey paint RAL7038 (except for galvanised-finishing models).
  - Upper box section treated by electrophoresis + 2 coats of pale grey paint RAL7038.

### 3.2. OPERATING MODES

For each direction of passage, the different configurations are as follows ((to be chosen when ordering)):

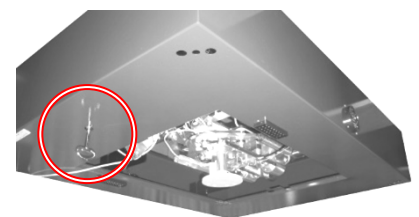
1. Free access (obstacle turning freely).
2. Permanently locked (obstacle blocked mechanically).
3. Locked, but unlocked in case of power failure.
4. Electrically controlled (free, locked, passage subject to authorisation) and locked mechanically in case of power failure.
5. Electrically controlled (free, locked, passage subject to authorisation) and unlocked in case of power failure.

A **A5-B3** passageway is thus configured to operate in mode 5 for direction A (entry) and in mode 3 for direction B (exit).

Only turnstiles configured in mode 3, 4 or 5 (for at least one direction of passage) are equipped with a control board.

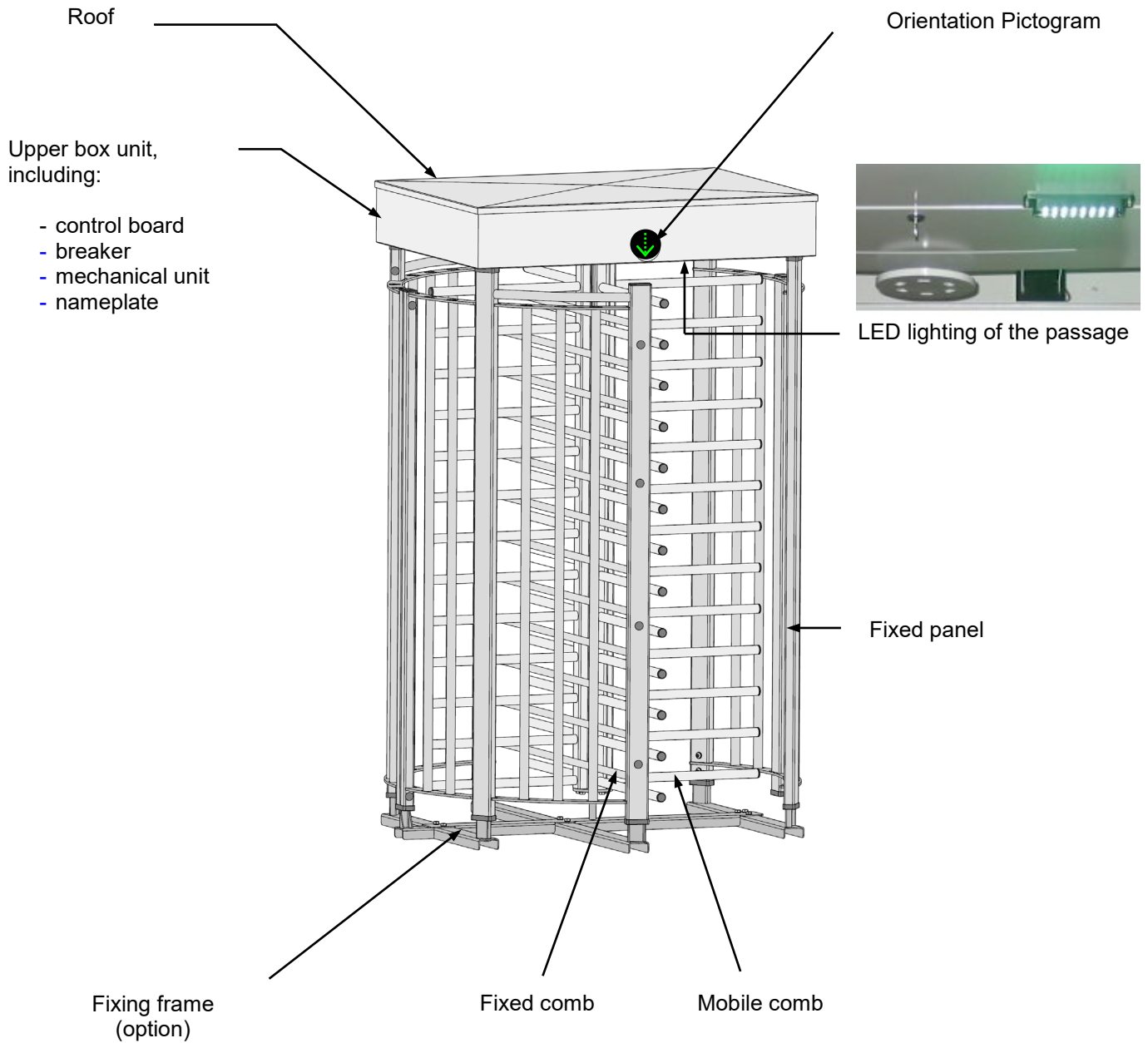
#### 3.2.1. Power failure

The key for mechanical unlocking (option) allows for the manual unlocking of the turnstile, regardless of the chosen operating mode, in 1 or 2 passage ways according to the selected option.





### 3.3. LOCATION OF THE COMPONENTS



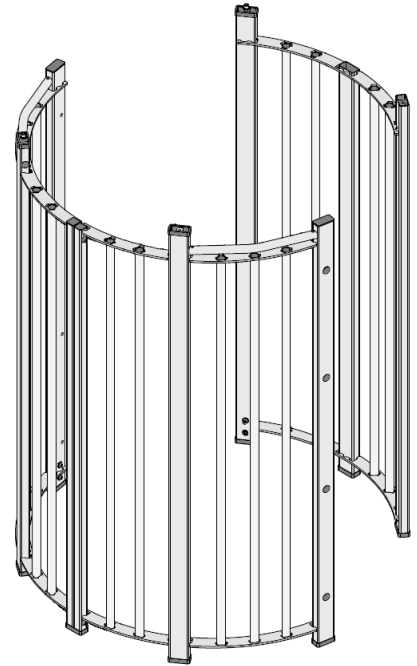


### 3.4. FIXED PANEL

Fixed modular panel made of painted steel, with curved parts circumscribing the passageway.

Hollow uprights are used to run the various electric cables.

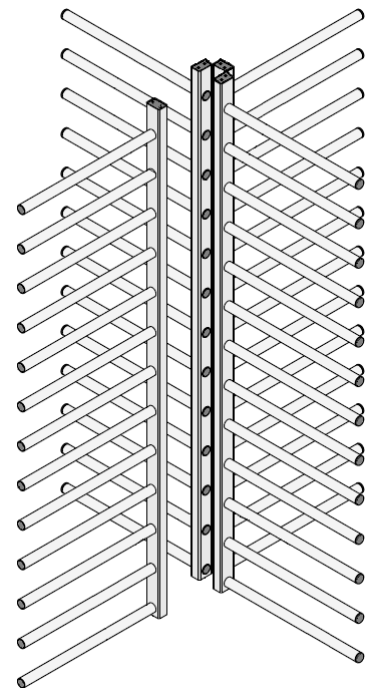
The panel is bolted to the ground or to the fixing frame.



### 3.5. MOBILE COMBS

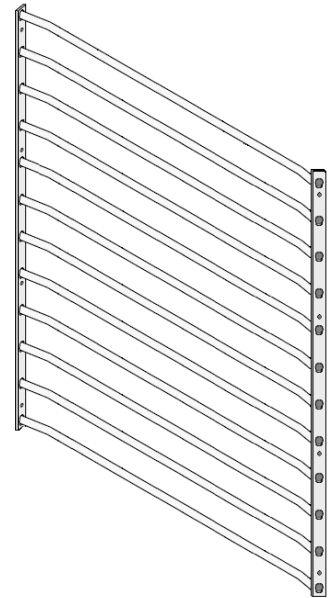
The rotating obstacle consists of 4 mobile combs positioned at 90° to one another.

The tubes that are closest to the ground may be equipped with optional heel guards (ch.2.5.10. ) that prevent users from getting their feet caught between the lowest tube and the ground.

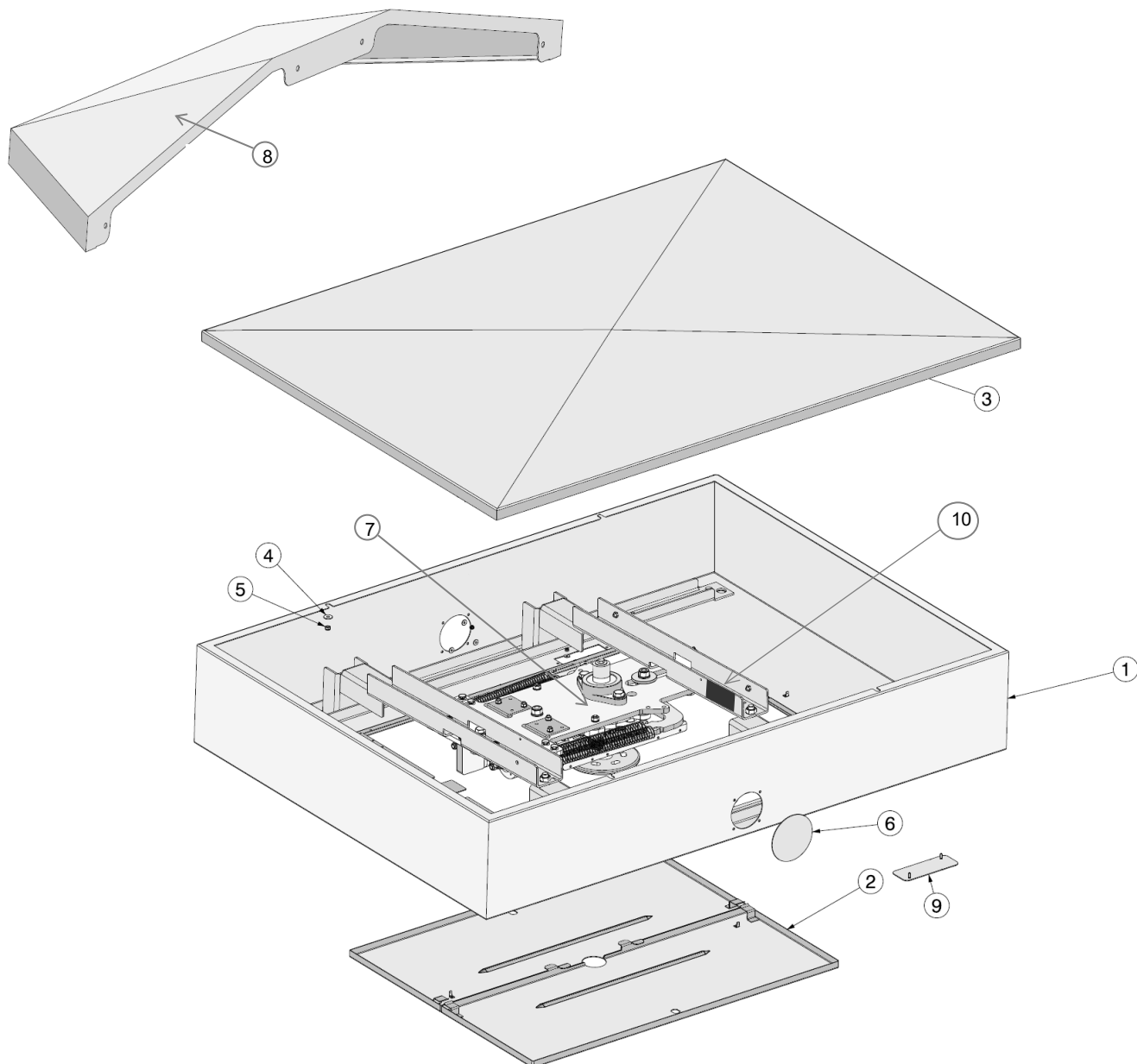


### 3.6. FIXED COMB

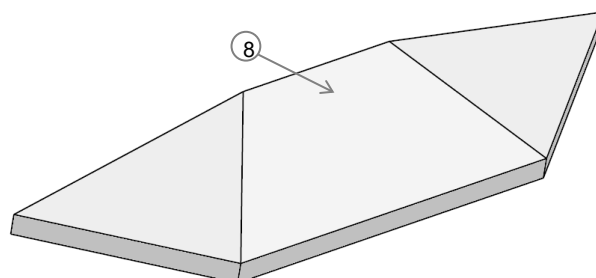
The fixed comb limits the access to one half of the turnstile, preventing unauthorised passage through the passageway.



### 3.7. UPPER BOX



1. Upper box.
2. Doors with key locks for access to the mechanism.
3. Diamond point roof for evacuation of water.
4. Washer for fixing the roof.
5. Nut for fixing the roof.
6. Knockout for pictogram cutout.
7. Mechanical assembly.
8. Canopy (option).
9. Cover for lighting cutout (under box).
10. Nameplate



### 3.8. HEATING RESISTANCE (OPTION)

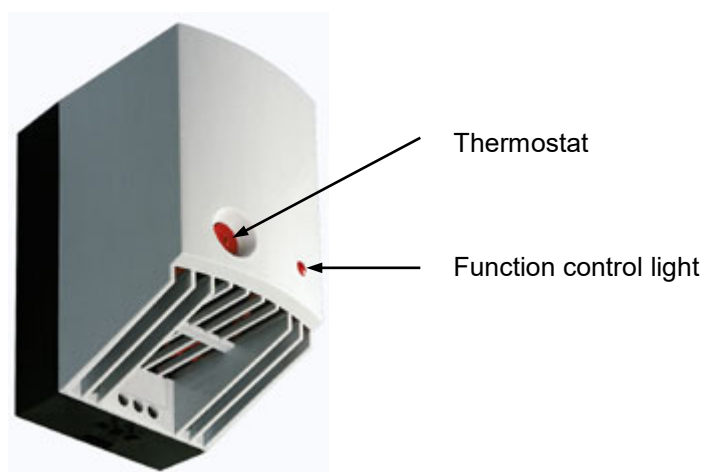
The fan heater is recommended when heating by electromagnets is insufficient (see Electro Heating parameter of OPTIONS menu).

The high performance axial fan provides forced air circulation.

The integrated thermostat is used to set the desired temperature.

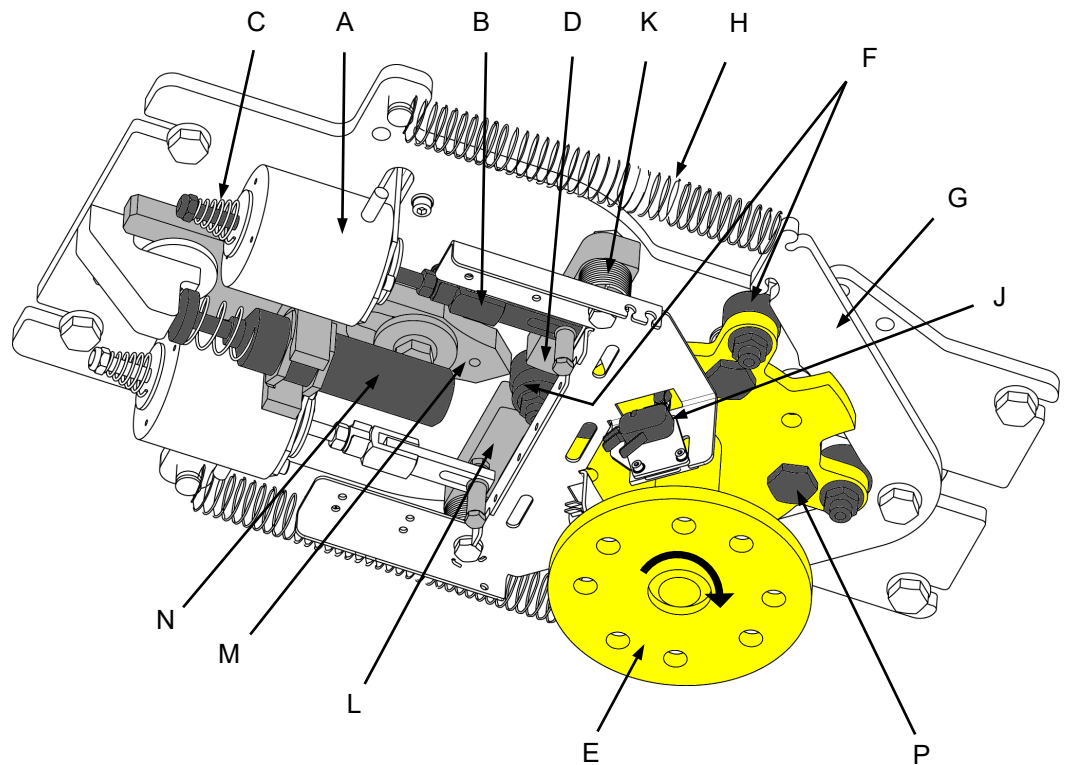
**Note:** thanks to this function, the heater must not be connected to the control unit.

Heating power adjusts to selected temperature ( $\pm 550$  W at 20°C).



### 3.9. MECHANICAL ASSEMBLY

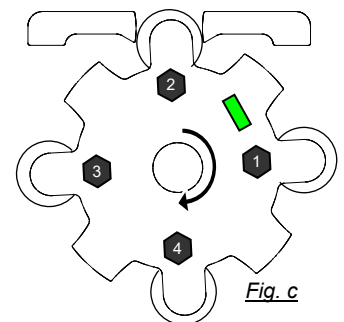
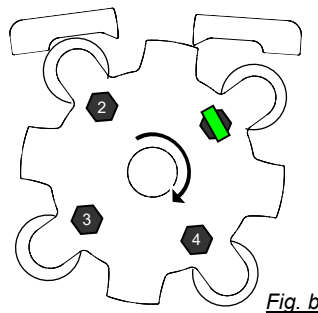
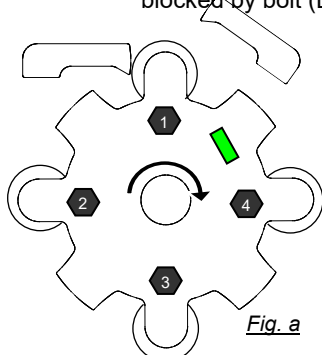
- A. Electromagnet.
- B. Connecting rod.
- C. Release spring.
- D. Mobile comb bolt.
- E. Rotor.
- F. Rollers.
- G. Compensating arm.
- H. Compensating arm release springs.
- J. Limit switch.
- K. Bolt release spring.
- L. Mobile comb bolt.
- M. Shock absorber cam.
- N. Hydraulic shock absorber.
- P. Limit switch cam.



#### 3.9.1. Modes 3 and 5 - Operating principle

In these modes, the obstacle is unlocked in case of power failure.

- At rest, the electromagnet (A) is under voltage. Its connecting rod (B) compresses the release spring (C) in order to bring the mobile comb bolt (D) in the closed position.
- When a passage is authorised (by a card reader, a remote control desk, etc.), power supply to the electromagnet is cut off. The release spring (C) then pulls, by means of the connecting rod (B), on the mobile comb bolt (D) and unlocks the obstacle (Fig.a).
- By pushing lightly on the obstacle, the user activates the rotor (E) (which turns, in this case, clockwise). At the same time:
  - The roller (F) pushes on the compensating arm (G). Its release springs (H) bring the rotor back to the rest position when the obstacle is released.
  - The limit switch cam (P) activates the limit switch (J), which powers up the electromagnet and drives the connecting rod back (B) to the bolt (D). The mobile comb bolt then closes up under the action of the release spring (K) (Fig.b).
  - The next roller (F) presses against bolt (L), lodges itself between the 2 mobile comb bolts and pushes on cam (M) of hydraulic shock absorber (N), which reduces its movement. The roller is then blocked by bolt (D), and the obstacle is mechanically locked (Fig.c).



### 3.9.2. Mode 4 – Operating principle

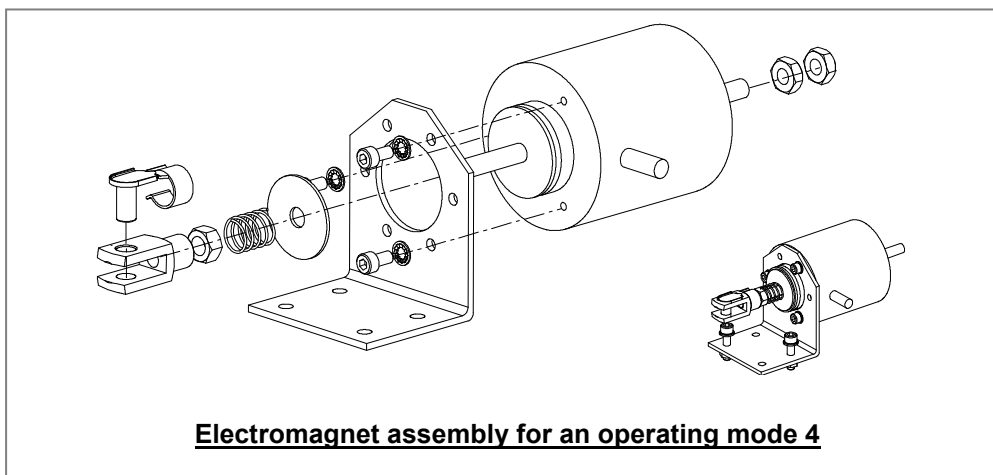
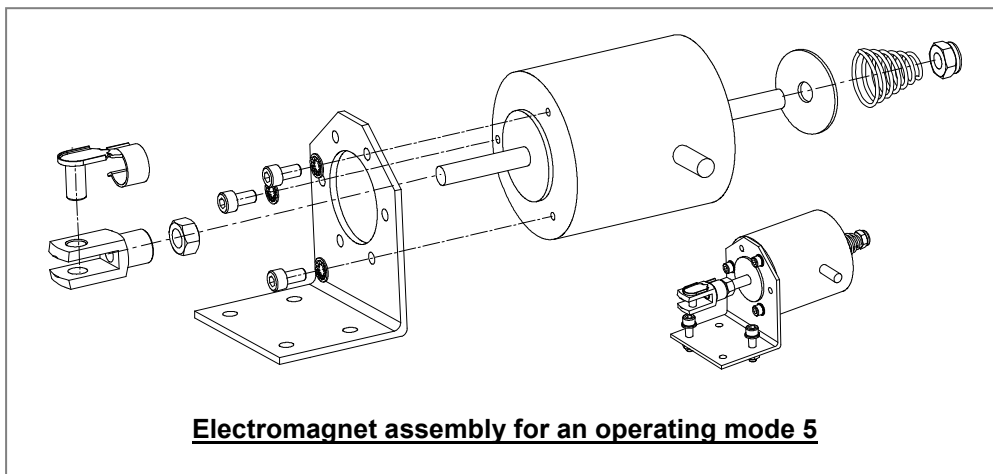
In this mode, the obstacle is locked in case of power failure.

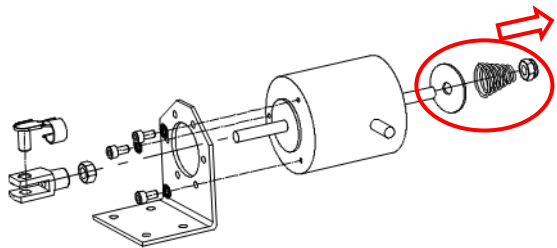
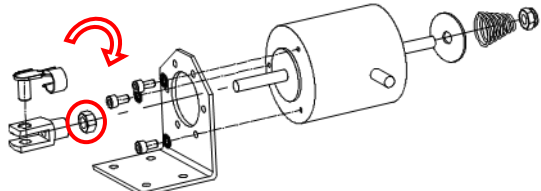
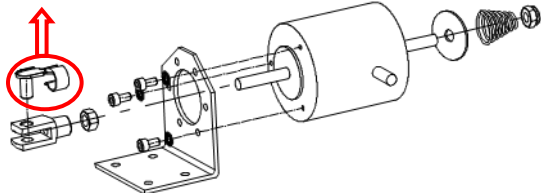
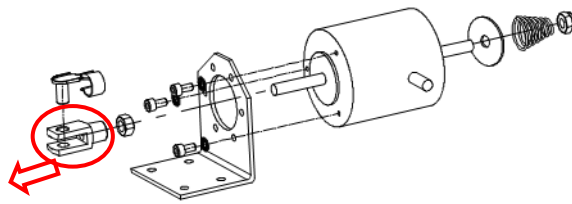
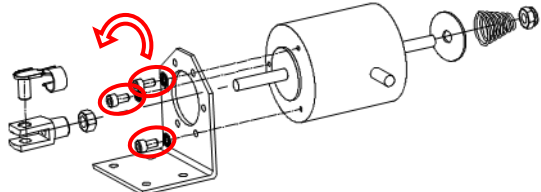
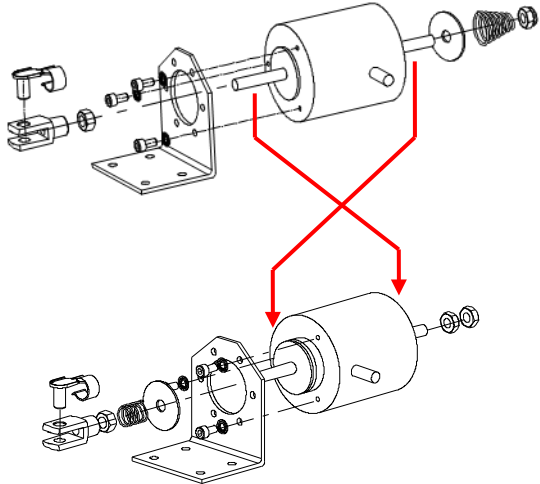
- At rest, the electromagnet (A) is not charged. The release spring (C) (in this case, on the connecting rod (B) side) pushes the rod towards the mobile comb bolt, in order to bring it in the closed position.
- When a passage is authorised, the charged electromagnet compresses the release spring (C) in order to pull, by means of the connecting rod (B), on the mobile comb bolt (D) and therefore unlock the obstacle.
- The remaining steps are identical to the preceding modes.

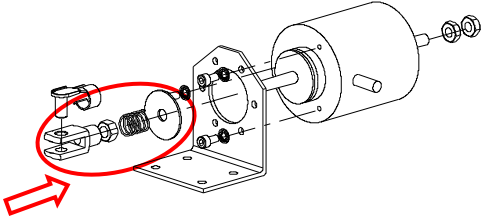
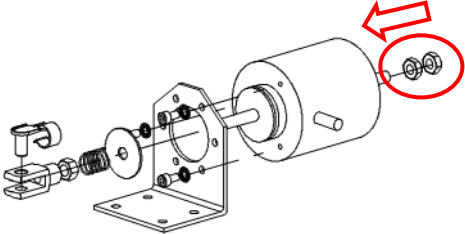
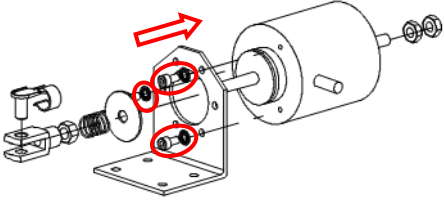
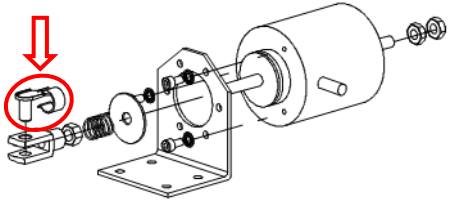
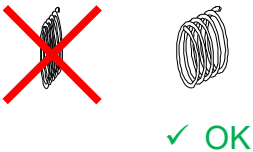

### 3.9.3. Conversion from operating mode 5 to mode 4

Unless otherwise specified, the turnstile is mounted according to mode 5 (unlocked in case of power failure, cf. ch.3.2. ).

Here after the procedure for an operating mode 4 (locked in case of power failure):

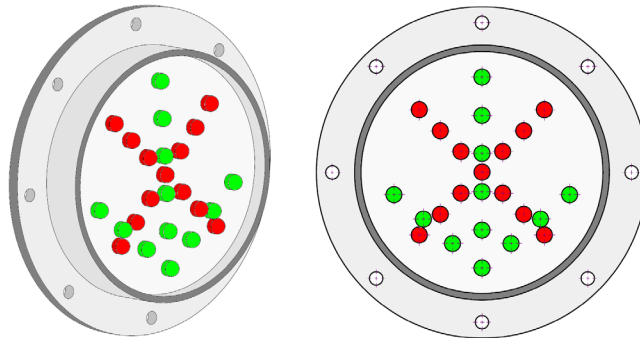


	<p>Remove:</p> <ul style="list-style-type: none"> <li>- The nut,</li> <li>- The <b>conical</b> spring (mode 5 spring),</li> <li>- The large washer.</li> </ul>
	<p>Unscrew connector nut.</p>
	<p>Remove connector clip.</p>
	<p>Remove the connector.</p>
	<p>Unscrew the electromagnet from its support.</p>
	<p>Turn the electromagnet 180°, keeping the electric cable on the same side.</p>

	<p>Place successively:</p> <ul style="list-style-type: none"> <li>- The large washer,</li> <li>- The new <b>cylindrical</b> spring (mode 4 spring),</li> <li>- The M8 flat nut,</li> <li>- The connector.</li> </ul>
	<p>Tighten both standard M8 nuts.</p>
	<p>Tighten the electromagnet on its support.</p>
	<p>Introduce the connector into the bolt connecting rod (not illustrated) and maintain by means of the clip.</p>
	<p>Check that the spring coils are not in contact when the electromagnet is powered (adjust connector position if necessary).</p>
	<p>In the OPTIONS menu of the control board, set Electromagnet parameter to A4 (or B4 according to the considered passage).</p>



## 3.10. PICTOGRAMS



Pictograms mounted on the housing can operate according to the 2 modes described below, depending on the electrical connections and their parameterization in the control board.

### 3.10.1. Orientation pictograms

Orientation pictograms indicate the status of the passageway, and thus help to orientate the user approaching the turnstile.

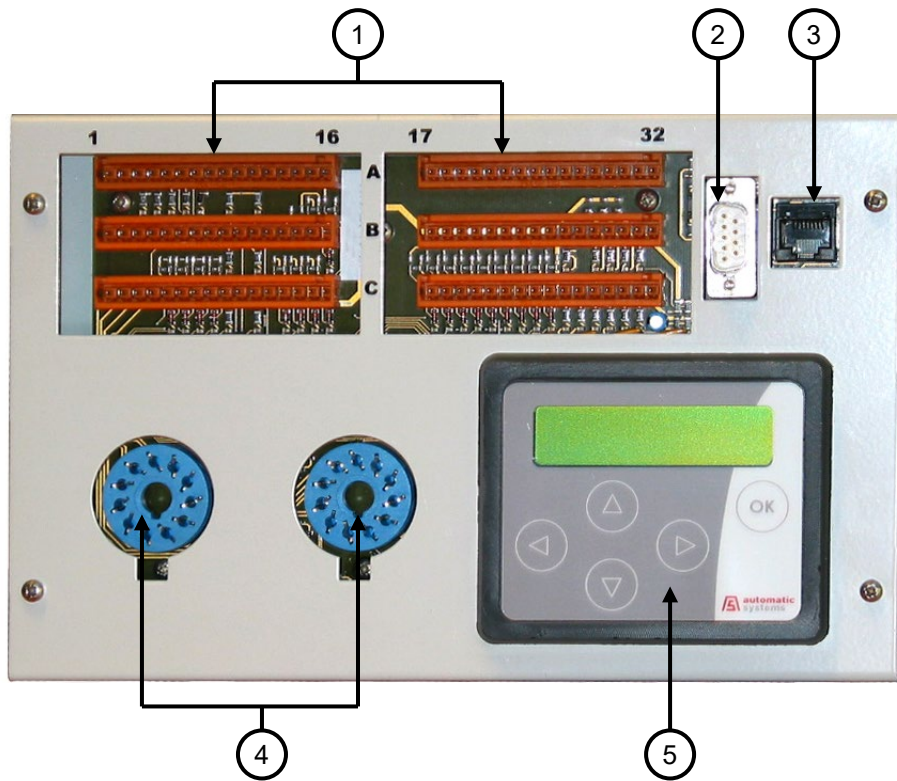
- Apparatus Out of Service: **X** in both directions
- Apparatus In Evacuation: **↙** in both directions
- Apparatus In Service (for each direction of passage):
  - Controlled Mode: **↙**
  - Free Mode: **↙**
  - Locked Mode: **X**

### 3.10.2. Function pictograms

Function pictograms indicate the functional status of the passageway to the user (for each direction): passage authorised or unauthorised.

- Locked Mode: **X**
- Free Mode:
  - If passage under way in opposite direction: **X**
  - If not: **↙**
- Controlled Mode:
  - At rest: Pictogram turned off or **X**, according to the status of "Idle Fct Picto" parameter of "Options" menu.
  - If passage under way in opposite direction: **X**
  - If passage authorisation: **↙**

### 3.11. CONTROL BOARD



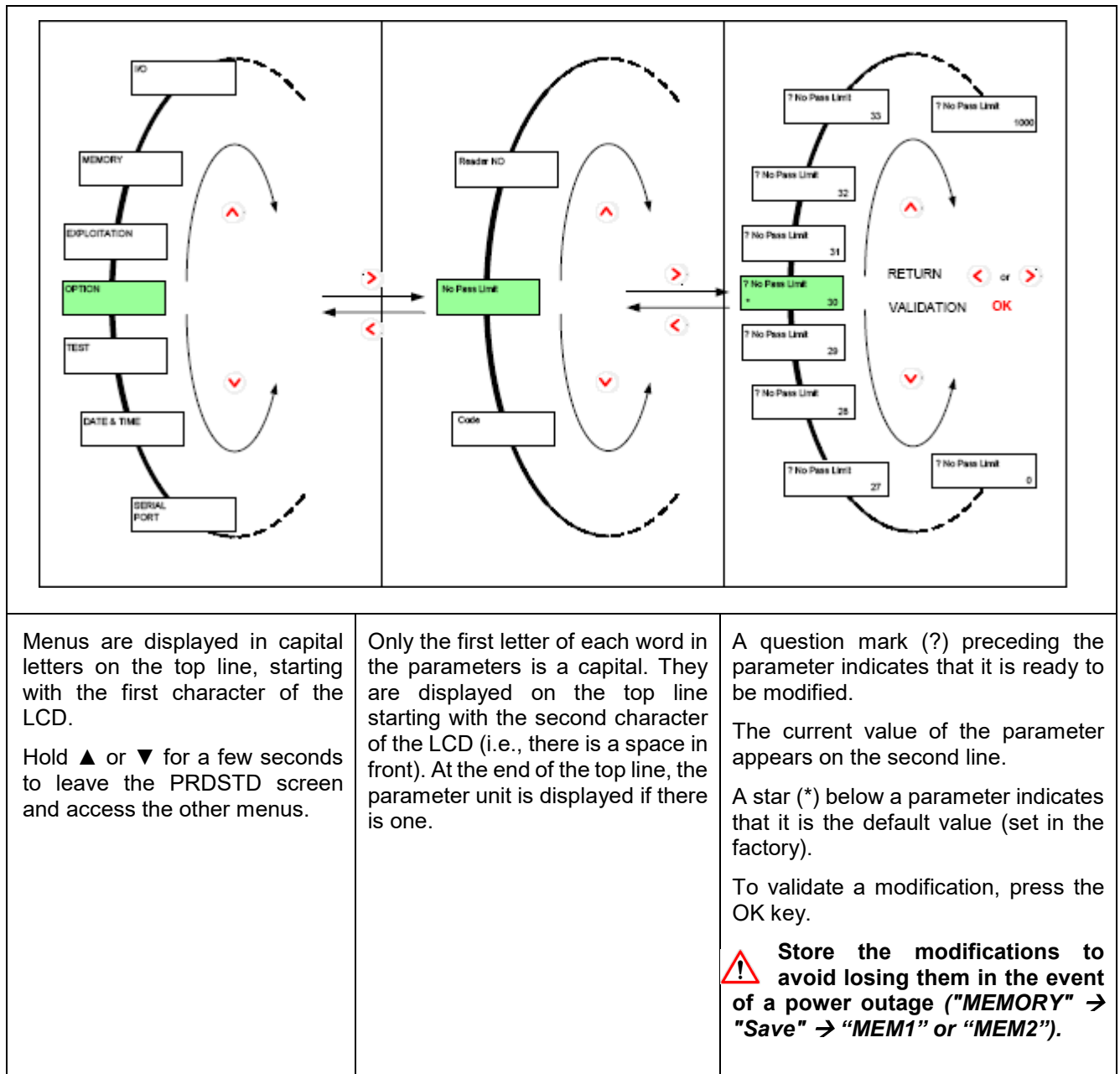
1. Input/Output terminal block (see terminal assignments, ch. "Electrical diagrams").
2. DB9 (CAN BUS) connector.
3. RJ45 (RS232) connector.
4. Presence sensor connectors (not used for the TRS37x).
5. Display.

The control board is the interface between the user and the full-height turnstile. It manages every operation the TRS performs, including every optional action.

The navigation of the display menus is based on an architecture using drop-down menus with three levels: MENU ↔ PARAMETERS ↔ VALUES.

Moving from one level to another is achieved via the ◀ ▶ keys and navigation inside those levels by means of the ▲ ▼ keys (press for a few seconds to go from the at-rest screen to another menu). Validating parameter changes is done by pressing the OK button.

**Note:** Below is a simplified version of the menus of the control board. For a more detailed description of all available functions and their parameters, please refer to the control board manual (available on request).



**Note:** Parameters of the control board have already been set in factory according to ordered configuration.  
 The most common functions are **bold**.

GROUP	Parameter	Values	Description
PRDSTD - TRS360	Software Ver	0E 00 04 00 00	Version number of the program implemented in the control board.
	OK key		<b>Reader simulation (direction A then B).</b>
OPERATION	Status		Display of the 100 last major events, with the date and time of their occurrence (access to previous events with ► and ▲ keys).
	No Diag		No diagnosis.
	Power Up		Power on.
	Power Down		Power off.
	Short Circuit		Detection of short-circuit on the digital outputs.
	Save Mem1		Manual saving of the values to Memory 1.
	Save Mem2		Manual saving of the values to Memory 2.
	Load Default		Loading of default values.
	Load Mem1		Manual loading of values from Memory 1.
	Load Mem2		Manual loading of values from Memory 2.
	Time Adjust		Change of date and time.
	Access Level Chg		Change of access level ("OPTION ► "Code").
	Download Chg Lv1		Level 1 modification to program.
	Download Chg Lv2		Level 2 modification to program.
	Download Chg Lv3		Level 3 modification to program.
	Reset Counters		Zeroing of counter 2.
	In Service		Apparatus in service.
	Out Of Service		Apparatus out of service.
	Emergency		Apparatus in Evacuation mode (free in both directions).
	Test		Apparatus in Test mode.
	Maintenance		Apparatus in Maintenance mode.
	Default LSA		Limit switch A defect. The turnstile remains in service.
	Default LSB		Limit switch B defect. The turnstile remains in service.
	Temperature		Display of temperature within casing.
	<b>Counter 1</b>		<b>Total number of passages in Directions A and B.</b>
	<b>Counter 2</b>		<b>Total number of passages in Directions A and B since last reset to zero.</b>
	<b>Reset counter 2</b>	<b>Yes</b>	<b>Zeroing of counter 2.</b>
	Autoriz. A n°		Number of authorisations in progress in Direction A.
	Autoriz. B n°		Number of authorisations in progress in Direction A.
	Gate State		Indicates the current status of the apparatus.
	Emergency		Apparatus in evacuation mode (free in both directions).
	Test		Apparatus in Test mode.
	Maintenance		Apparatus in Maintenance mode.
	In Service		Apparatus in service (configuration in "EXPLOITATION" group).
	Out of service		Apparatus out of service (locked in both directions): command received on Input DI5.
	Pass A State		Indicates the status in which the apparatus is when it is in service, for this direction of passage. The configuration is carried out in the "EXPLOITATION" group.
	Locked		Obstacle locked: passage in this direction impossible.
Free		Obstacle unlocked: passage in this direction free and without control.	
Controlled		The obstacle is unlocked to release the passage, once authorized by the card reader.	
Pass B State		Same as "Pass A State", for Direction B.	
Locked			
Free			
Controlled			

GROUP	Parameter	Values	Description
-------	-----------	--------	-------------

TIMINGS	No Passage		<b>Delay allowed for user to pass through the turnstile (=time allowed for the obstacle to reach the limit switch after opening command).</b>
	Passage Info		Duration of the passage information impulse.
	No Pass Info		Duration of the passage information impulse.
	Fraud Info		Duration of the fraud information impulse.

OUTPUT FUNCTIONS	Relay 1		Each output can provide one of the following pieces of information:
		LED Lighting	LED lighting activated by the light sensor.
		LSB Error	Direction B limit switch sensor has not been reached before the no-passage time-out.
		LSA Error	Direction A limit switch sensor has not been reached before the no-passage time-out.
		Fraud AB	Limit switch activated without prior Open command.
		Fraud B	Direction B limit switch detection not preceded by an Open command.
		Fraud A	Direction A limit switch detection not preceded by an Open command.
		No Passage B	No detection on limit switch within the time limit following an Open command in Direction B.
		No Passage A	No detection on limit switch within the time limit following an Open command in Direction A.
		Pass B IP NC	Passage in Direction B in progress (Signal NC).
		Pass B IP NO	Passage in Direction A in progress (Signal NO).
		Pass A IP NC	Passage in Direction A in progress (Signal NC).
		Pass A IP NO	Passage in Direction A in progress (signal NO).
		Passage B NC	Passage in Direction B completed (Signal NC).
		Passage B NO	Passage in Direction B completed (Signal NO).
		Passage A NC	Passage in Direction A completed (Signal NC).
		Passage A NO	Passage in Direction A completed (Signal NO).
		Red Fct Icon B	Function pictogram command in Direction B: red indicator light.
		Grn Fct Icon B	Function pictogram command in Direction B: green indicator light.
		Red Fct Icon A	Function pictogram command in Direction A: red indicator light.
		Grn Fct Icon A	Function pictogram command in Direction A: green indicator light.
		Red Ori Icon B	Orientation pictogram command in Direction B: red indicator light.
		Grn Ori Icon B	Orientation pictogram command in Direction B: green indicator light.
		Red Ori Icon A	Orientation pictogram command in Direction A: red indicator light.
		Grn Ori Icon A	Orientation pictogram command in Direction B: green indicator light.
		Solenoid B	Command of the electromagnet of Direction B.
		Solenoid A	Command of the electromagnet of Direction A.
		None	No signal.
	Relay 2		Same as Relay 1
	Relay 3		Same as Relay 1
	Relay 4		Same as Relay 1
	Relay 5		Same as Relay 1
Relay 6		Same as Relay 1	
Output 7		Same as Relay 1	
Output 8		Same as Relay 1	
Output 10		Same as Relay 1	
Output 11		Same as Relay 1	
Output 12		Same as Relay 1	
Output 13		Same as Relay 1	
Output 14		Same as Relay 1	
Output 15		Same as Relay 1	

GROUP	Parameter	Values	Description
I/O	Input 1		Status of the digital inputs: DI8, DI7, DI6, DI5, DI4, DI3, DI2, DI1.
	Input 2		Status of the digital inputs: DI16, DI15, DI14, DI13, DI12, DI11, DI10, DI9.
	Input 3		Status of the digital inputs: DI0, DI1, DI2, DI3, DI4, DI5, DI6, DI7.
	Output 1		Status of the digital outputs: DO8, DO7, DO6, DO5, DO4, DO3, DO2, DO1.
	Output 2		Status of the digital outputs: DO15, DO14, DO13, DO12, DO11, DO10, DO9.
	AnalogIn 1		Value of the analogue input AI1 (x10mV).
	AnalogIn 2		Value of the analogue input AI2 (x10mV).
	AnalogOut 1		Value of the analogue output AO1 (x10mV).
	AnalogOut 2		Value of the analogue output AO2 (x10mV).
MEMORY	Load	Default	Loading of the default values of the parameters.
		Mem2	Loading of the values from Memory 2.
		Mem1	Loading of the values from Memory 1.
	Save	Mem2	Saving of the values to Memory 2.
		Mem1	Saving of the values to Memory 1.
EXPLOITATION	Direction A	Ctrl panel	Direction A passage configured via the control panel.
		Locked	Direction A passage always closed (even if there is an Open command).
		Free	Direction A passage always allowed (Open command not necessary).
		Controlled	Direction A passage subject to authorisation (see Reader): opens if there is an Open command.
	Direction B	Ctrl panel	Direction B passage configured via the control panel.
		Locked	Direction B passage always closed (even if there is an Open command).
		Free	Direction B passage always allowed (Open command not necessary).
		Controlled	Direction B passage subject to authorisation (see Reader): opens if there is an Open command.
	Out Of Service	In Service	Apparatus in service: functions according to the mode defined in the "Direction A" and "Direction B" parameters.
		Out Of Service	Apparatus out of service: locked in both directions.
	OPTIONS	Code	-32768 to 32767
Language		Deutsch	Choice of the menu language : German.
		Français	Choice of the menu language : French.
		English	Choice of the menu language : English.
Idle Fct Picto		Off	Choice of display of the function pictogram when it is at rest: off.
		Red	Choice of display of the function pictogram when it is at rest: red cross.
Thermostat °C		-10 to 100	Temperature beneath which the heating element (connected to DO9) is engaged.
Electro Heating		Activated	Activates the electromagnets when the temperature descends below the limit set at the "Thermostat °C", which maintains some warmth in the immediate environment of the electromagnets.
		Deactivated	Heating by electromagnets deactivated.
Memo reader A		Yes	Storage by the reader of the Open commands given in Direction A.
Memo reader B		Yes	Storage by the reader of the Open commands given in Direction B.
Electromagnet A	A4	Assembly of the electromagnet used for Direction A:	

GROUP	Parameter	Values	Description
-------	-----------	--------	-------------

	Electromagnet B	A5	mode 4 (= locked when not powered). Assembly of the electromagnet used for Direction A: mode 5 (= unlocked when not powered).
		B4	Assembly of the electromagnet used for Direction B: mode 4 (= locked when not powered).
		B5	Assembly of the electromagnet used for Direction B: mode 5 (= unlocked when not powered).
	Fct Reader	Combined Mode	This operating mode combines the following two modes. If an impulse is given, the apparatus functions in impulse mode, if not it functions in maintained mode. Any signal that occurs before detection of the limit switch or the end of the no-passage time-out is regarded as an impulse.
		Hold Mode	Passage managed by the reader: the passage is freed for as long as the input reader is activated.
		Pulse Mode	Passage managed by the AS1300: each reader impulse, which can be memorised, frees the access for a passage. As soon as the passage is carried out, the obstacle is locked.
	Reader NO	Yes	Reader operation in Direction A and B (active in high status): signal NO (Normally Open).
		No	Reader operation in Direction A and B (active in low status): signal NC (Normally Closed).
No Pass Limit	0 to 1000	Maximum number of <u>consecutive</u> no-passages before indicating that the limit switch is defective.	

TEST	Test Mode	Wiring	Wiring check of the AS1300 outputs.
		Alternate Mode	Alternation of the following two modes.
		Direction B	Successive lockings/unlockings of Direction B passage.
		Direction A	Successive lockings/unlockings of Direction A passage.
	Communication	Menu	Sending of complete menu to external PC.
		Stack Watch	Sending of stack values to external PC.
		Diag. Extract.	Sending of diagnostic table to external PC.
	Param. Extrac.	Sending of parameter values to external PC.	

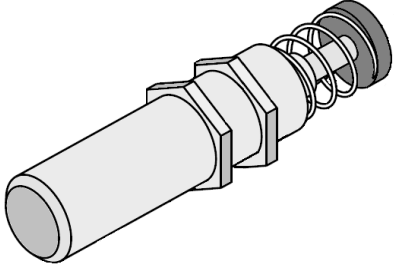
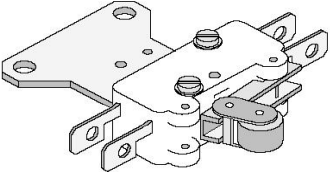
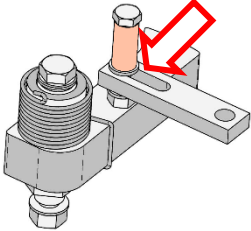
DATE & TIME	Year	0 to 99	Setting of year
	Month	1 to 12	Setting of month
	Day	1 to 31	Setting of day
	Hour	0 to 23	Setting of hour
	Minute	0 to 59	Setting of minutes
	Second	0 to 59	Setting of seconds

SERIAL PORT	Modbus Address		Definition of parameters for Modbus communication.
	Com1 Baudrate		
	Com1 Parity		
	Debug Modbus		
	Test Modbus		

LIGHT SENSOR	Value	0 to 100	Value measured by light sensor (option).
	Trigger	0 to 100	Value for which the lighting is switched on/off.
	Delay On	0 to 9999	Delay before activation of LED lighting.
	Delay Off	0 to 9999	Delay before deactivation of LED lighting.

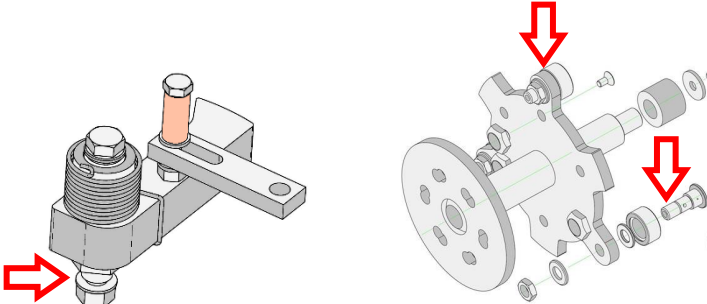
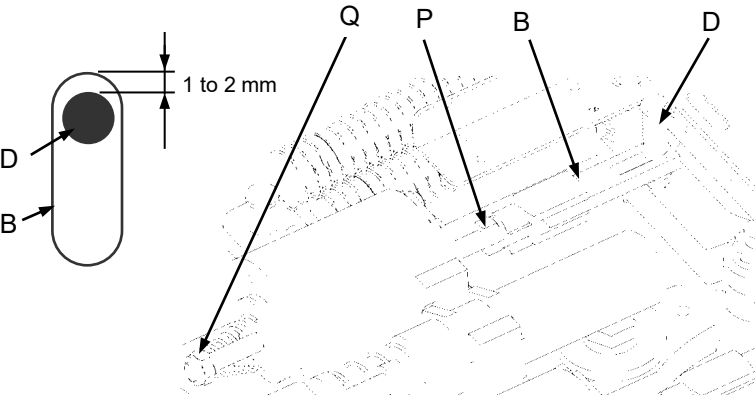

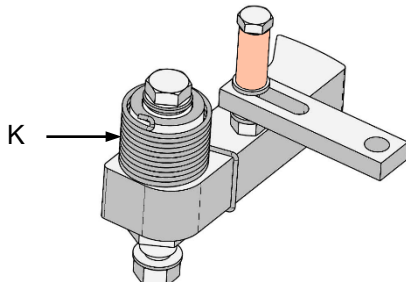


## 4. MAINTENANCE

<p>Each month (see note opposite)</p>	<p>Clean up the bodywork, walls and obstacles with water and a light detergent (notably, non chlorinated).</p> <p>Clean up the stainless steel mobile combs (optional) with a cleaning product designed for stainless steel surfaces. <i>Automatic Systems</i> can provide a cleaning product approved under reference 0/6031/000.</p> <p>Repair any possible splinter, bump or scratch on the painted surfaces of the equipment.</p> <p><b>Note:</b> Maintenance frequency must be adapted to the conditions of use (especially, when the turnstile is installed in an oxidizing environment: entrance of a public pool, seaside, industrial plant, etc.).</p>
<p>Each 6 month or after 500.000 cycles</p>	<p>Check the cinematic parts: springs, shock absorber, limit switches and replace these devices in case of wear.</p>
<p>1.000.000 cycles</p>	<p>Replace the shock absorber (N, ch.3.8. ), which effect softens with wear.</p> 
	<p>Replace the two limit switches (J, ch.3.8. ), whose electric resistance increases with contact wear.</p> 
	<p>Verify the tightening of the screwed elements of the mechanical structure and mobile combs.</p>
	<p>Use a silicon spray (ref. 0/7508/284) on the bolt pivot.</p> 
<p>5 years</p>	<p>Replace the control board battery: lithium cell 3V/48mA. <i>Automatic Systems</i> can provide a product approved under reference 0/7111/010.</p> <p>To reach the battery, remove the front panel of the control board by unscrewing its 4 bolts.</p>

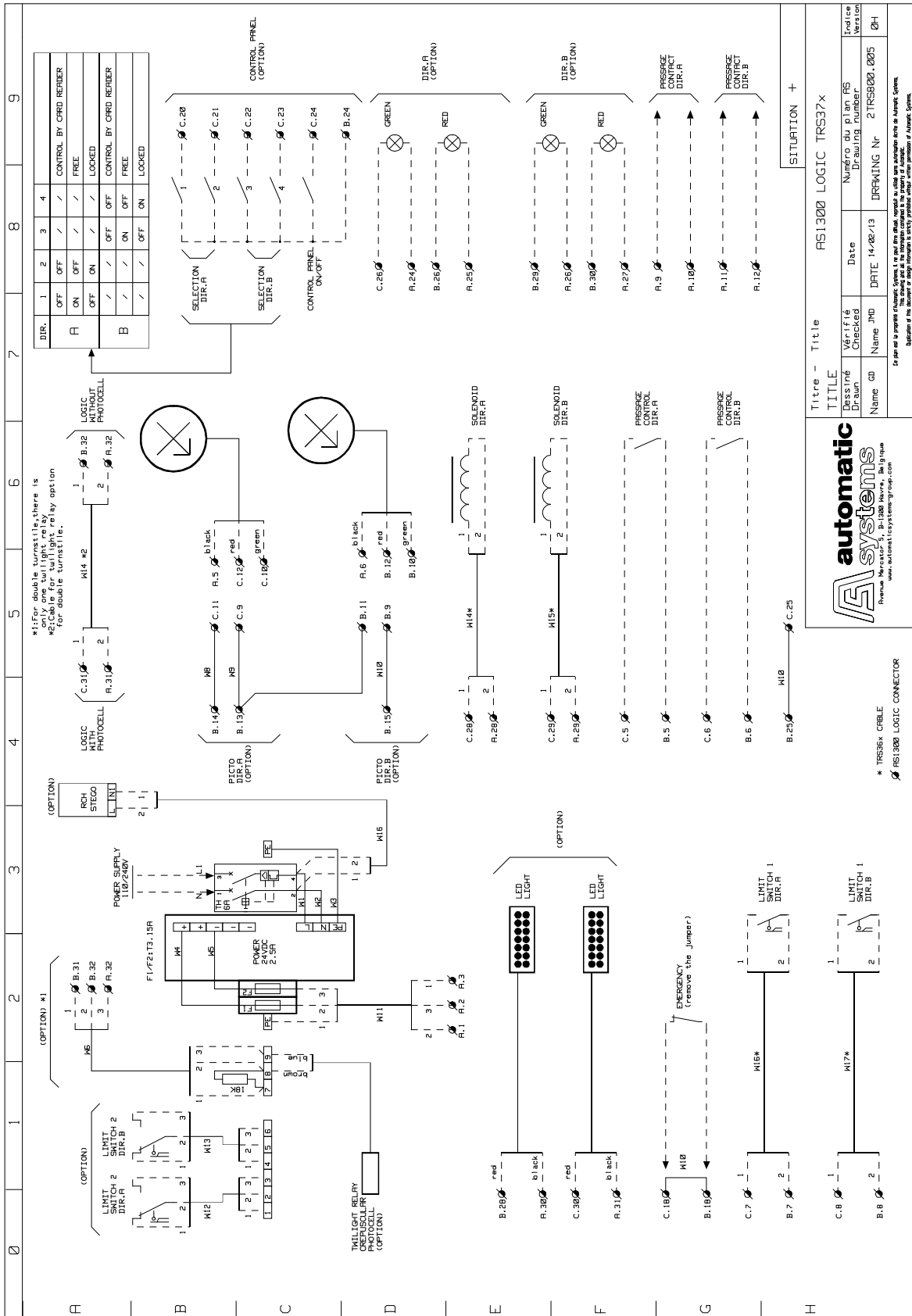


## 5. TROUBLESHOOTING

<p>Turnstile out of service.</p>	<p>See messages on the control board display ("OPERATION" group, "Status" parameter).</p>
<p>Friction is perceptible during movements.</p>	<p>The bolts and/or rollers may be jammed, especially in harsh environments (e.g., in a sea environment). Use a silicon spray (ref. 0/7508/284) on parts that need to be released.</p> 
<p>Obstacle cannot be unlocked.</p>	<p>Leave 1 to 2 mm gap between the connecting rod (B) of the electromagnet and the bolt stem (D) (setting the length of the connecting rod by means of nuts P and Q) in order to create an impact with the bolt when the electromagnet is activated.</p> 
	<p>The electromagnets may be blocked if tightened too firmly. Slightly loosen nut (Q) in order to decompress spring (C).</p> 
	<p>Spring (C) does not have the energy necessary to pull the bolt. Compress the spring by tightening nut (Q) or replace it.</p>
<p>Obstacle cannot be locked.</p>	<p>Bolt release spring (K) is loose. Retighten the spring by adding a few turns to it.</p> 

# 6. ELECTRICAL DIAGRAMS

**Note:** Informative diagram. Reference document is the one included with the equipment.



40 500 008

## 6.1. CONTROL BOARD TERMINAL BLOCK ASSIGNMENT



The table below indicates the **factory settings** of the inputs/outputs.  
 The outputs can be set differently in the OUTPUT FUNCTIONS group.

The inputs/outputs of the options are **highlighted**.

	C		B		A	
1	BCL1+	<i>Not used</i>	BLC3+	<i>Not used</i>	24V	PWR
2	BCL1-	<i>Not used</i>	BCL3-	<i>Not used</i>	0V	PWR
3	BLC2+	<i>Not used</i>	BCL4+	<i>Not used</i>	PE	
4	BCL2-	<i>Not used</i>	BCL4-	<i>Not used</i>	(PE)	
5	DI1	Pass Control A	24V		GND	
6	DI2	Pass Control B	24V		GND	
7	DI3	FCA (NO)	24V		GND	
8	DI4	FCB (NO)	24V		GND	
9	REL1+	Grn Ori Icon A	REL3+	Grn Ori Icon B	REL5+	Pass Contact A
10	REL1-		REL3-		REL5-	
11	REL2+	Red Ori Icon A	REL4+	Red Ori Icon B	REL6+	Pass Contact B
12	REL2-		REL4-		REL6-	
13	DI5	Alarm (NO) (= Out of Service)	24V		GND	
14	DI6		24V		GND	
15	DI7		24V		GND	
16	DI8		DI18		GND	
17	DI9		24V		GND	
18	DI10	Evacuation (NC)	24V		GND	
19	DI11		24V		GND	
20	DI12	Desk A1	24V		GND	
21	DI13	Desk A2	24V		GND	
22	DI14	Desk B1	24V		GND	
23	DI15	Desk B2	24V		GND	
24	DI16	Desk Key (NO)	24V		GND	
25	DI17	Connected to 24V	24V		GND	
26	DO7	Grn Fct Icon A	DO8	Red Fct Icon A	GND	
27	DO9	Heater not self-regulated	24V		GND	
28	DO10	Solenoid A	DO13	LED Lighting	GND	
29	DO11	Solenoid B	DO14	Grn Fct Icon B	GND	
30	DO12	LED Lighting	DO15	Red Fct Icon B	GND	
31	AO1	Used (=AI2) (*)	AO2	Used	GND	
32	AI1		AI2	Light sensor	GND	

(\*) Value of analogue input AI2 (light sensor signal) is copied to analogue input AO1 to be used in a double turnstile. This signal can then be cabled to the second AS1300 in lieu of a second light sensor.

## 7. EC DECLARATION OF CONFORMITY



EC declaration of conformity



We, undersigned,

**AUTOMATIC SYSTEMS SAS**  
22 rue du 8 mai 1945  
95340 PERSAN  
FRANCE

Herewith declare that the following machine

**Full-height turnstile**

**TRS 370**  
**TRS 371**  
**TRS 372**  
**TRS 373**  
**PMR TRS**

is in accordance with the conditions of the following Directives, standards and other specifications:

- Machinery Directive 2006/42/CE.
- Low-voltage Directive 2014/35/UE.
- Electromagnetic compatibility Directive 2014/30/UE.
- Directive RoHS (Restriction of Hazardous Substances) 2011/65/EU.
- EN 12100:2010: Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010).
- IEC 60204-1 / A1 : 2016: Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
- EN 61000-6-3 / A1 : 2011: Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments.
- IEC 61000-6-2 : 2016: Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments.

Made in PERSAN,  
Date: 2018.10.19  
Name: Michel TOUSIGNANT  
Function: R&D Director

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