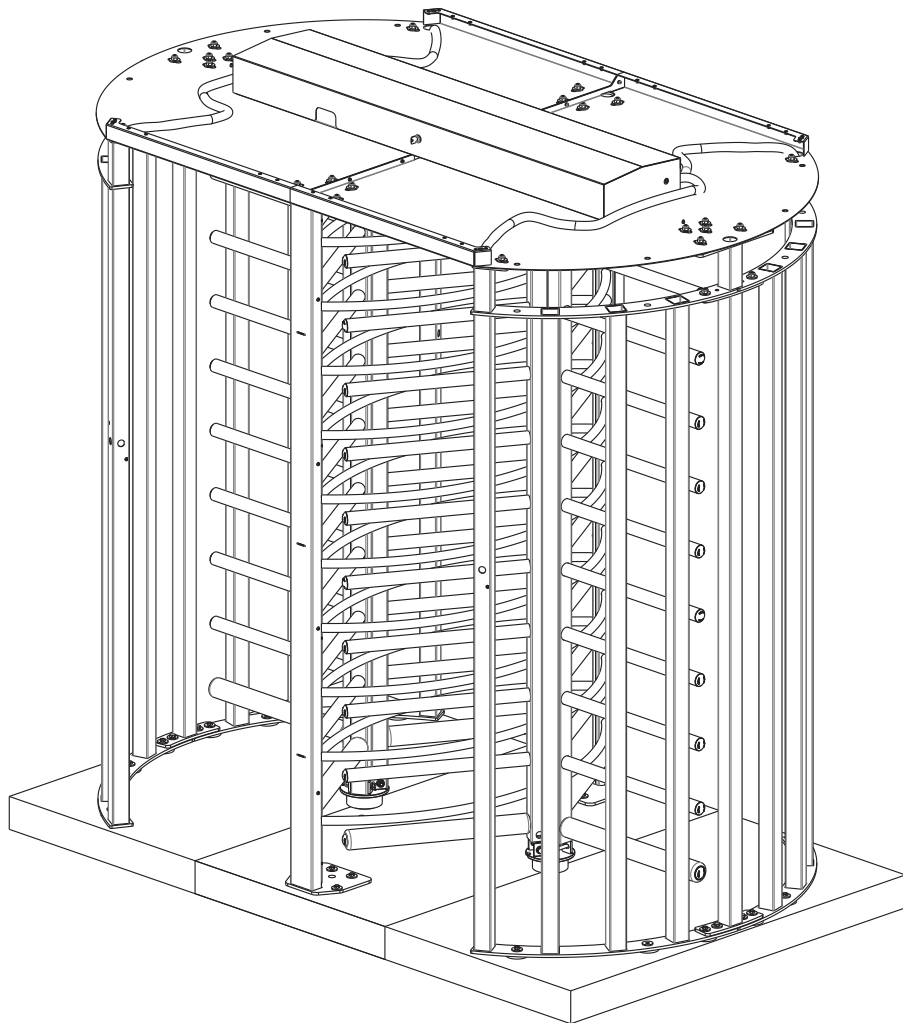


Turnstile Duo



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Códe: 069.31.222
Version: 02 - English

This manual was elaborated by:

Digicon S.A. Electronic Control for Mechanics Documentation Sector - EDS

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1. Important instructions

You can see, below, the symbols that will appear in this manual, signaling important moments. It is essential to pay attention to them.



TIP: Indicates something Digicon considers important.



CAUTION: Indicates a moment of extreme caution when handling the equipment/product



ATTENTION: Indicates a moment when your observation skills should be extremely productive.



INFORMATION: Presents interesting facts about the purchased product.



QR CODE: Presents additional information or links with more details about the presented text.

2. Orientations

- Read the information and instructions of this manual carefully, before using the product. This ensures the correct use of the equipment and maximum use of its technical features as well as a prolonged service life.
- Keep this manual for future consultations.
- Digicon reserves its right to alter its products at any moment to adapt them to more recent technical advancements.
- Digicon maintains its right to alter the information contained in this manual without previous notice.
- Digicon does not provide any contractual warranty concerning the information in this manual, and cannot be held responsible for errors it may contain and problems due to its use.
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3. Introduction

The Full-height turnstile Duo is a bidirectional access control equipment for entrance and exit of pedestrians. Highly resistant, both indoors and outdoors, it is sturdy, safe, and firmly fixated to the floor. It is completely integrated to access controllers. This manual presents a detailed description the installation of Duo and of the components that accompany it.

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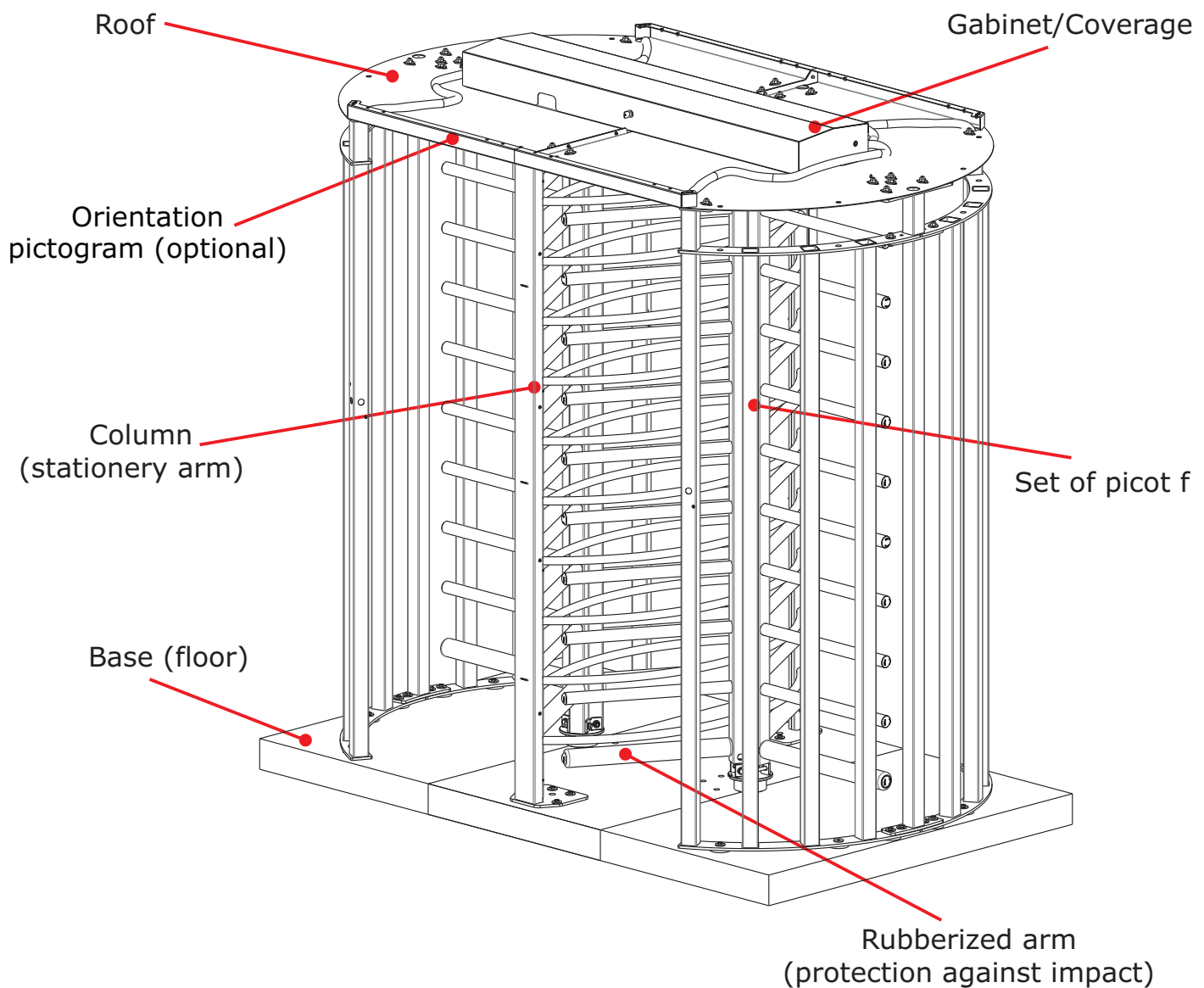
4. Features of Turnstile Duo

Bidirectional access control equipment for entrance and exit of pedestrians. The double configuration optimizes the space and facilitates installation.

Highly resistant both indoors and outdoors

Robust, safe, and firmly fixed to the floor.

- Complete integration to access controllers.
 - Two rotating axles with Digicon mechanism and control.
 - Treatment and finishing hat allow its installation outdoors.
 - Last arm rubberized with user protection against impact.
- Internal lighting.

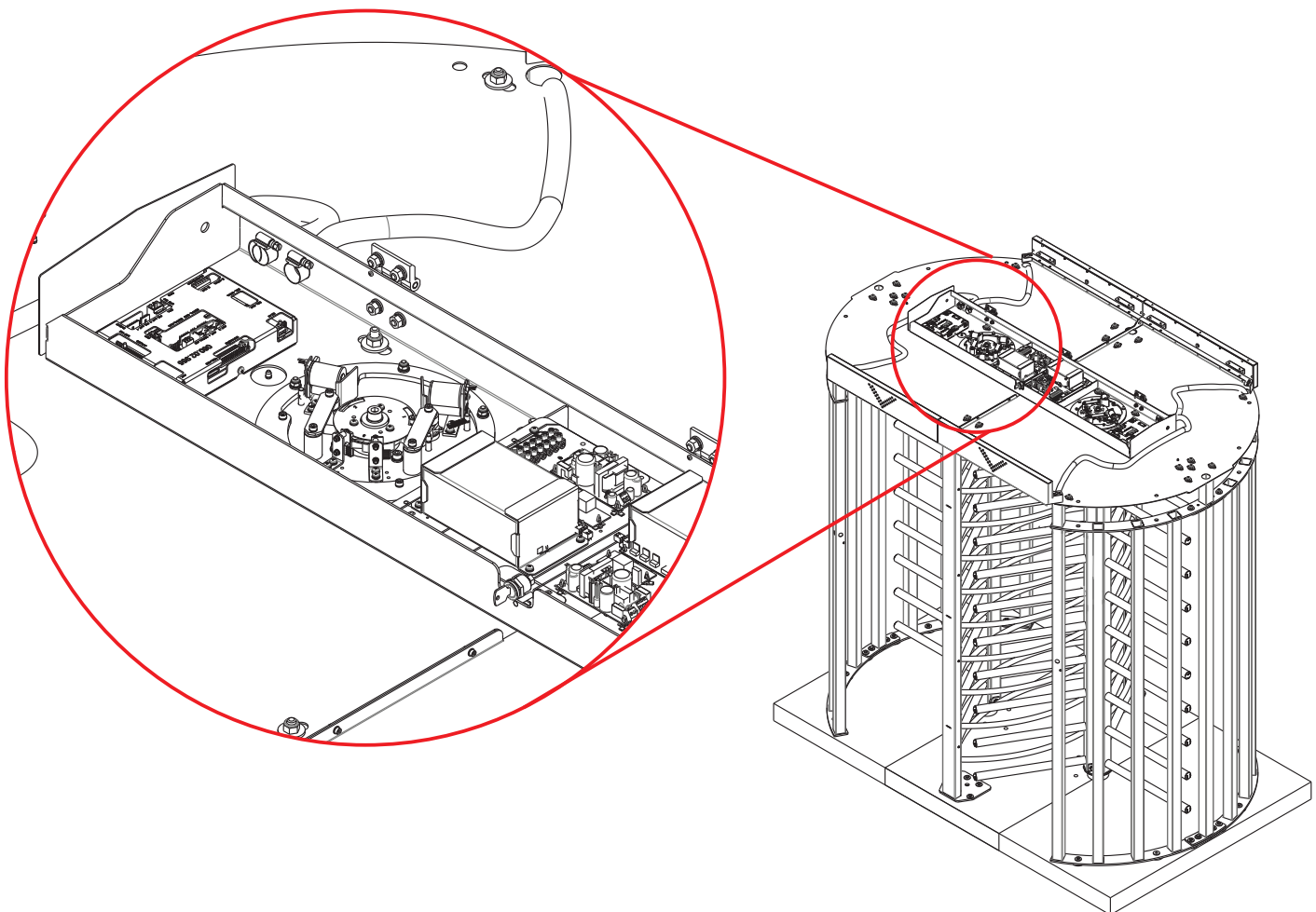


5. Turnstile Duo operation

In the basic mechanism, Turnstile Duo has bidirectional motorized turning with two 12 V electromagnets for activating the locks and two optic sensors that can provide the signal for activating the electromagnets and to the return of passage.

The electronic model includes a microprocessor control board (optional), where a signal enabling passage is sent through one of the inputs, depending on the passage direction. If this signal is recognized, the equipment will allow the turning of the arm of Duo. After half of the turning is complete (60 degrees), a 400 milliseconds returning signal will be sent, informing the passage direction. After the signal, the arm cannot be returned to the previous position.

Depending on the Duo model and configuration, if the passage is forced without the enabling signal, an electromagnet will be activated to prevent turn. In addition, the equipment can emit a signal for a sound alarm and/or the exhibition of a red X on the upper panel display (models with pictogram). In this case, a return signal will be sent, indicating that the turnstile was forced, informing the direction of turn.



6. Installing Duo

6.1 Prepare the Turnstile assembly

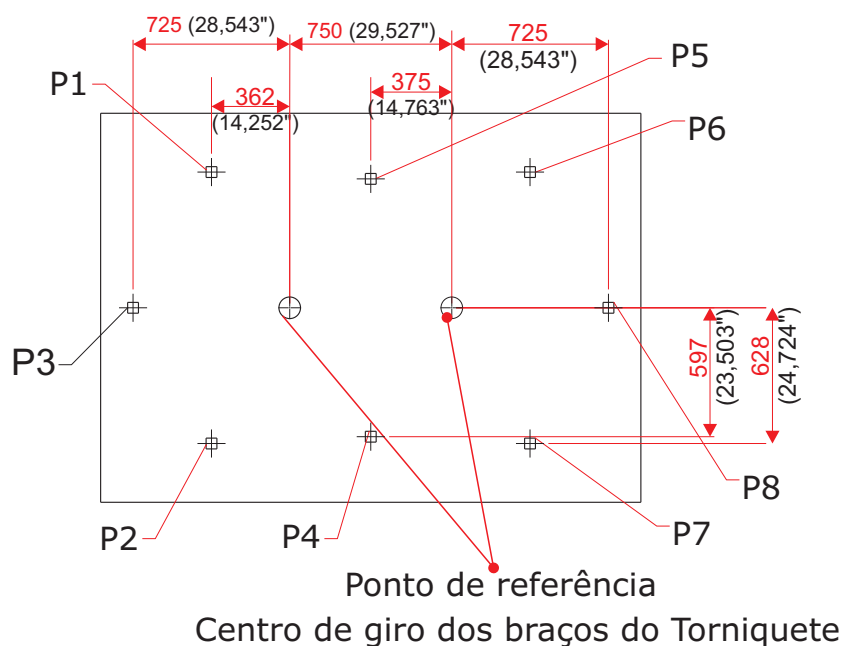
The floor where the turnstile will be fixed must meet the following specifications:

- Dimensions: Direction of flow 2.4m x columns width 1.4m x concrete height 0.1 m;
- Necessary height: 2.4 meters;
- Level the floor for better product performance;
- Floor specification (FCK15 M.P.A. concrete or equivalent);
- Adequate area for assembling the turnstile: 2.4m x 1.4m x 2.6m.



INFORMAÇÃO: Illustrative image (measures specified in milimeters and inches.)

Power point input and network cable can be on the floor, preferably at point 3 or overhead pipes.



Obs.: The dimensions of the concrete block and power inputs are only a suggestion. The client can choose smaller bases (footing) at the fixing points (determined by template).

List of tools for assembling the Turnstile:

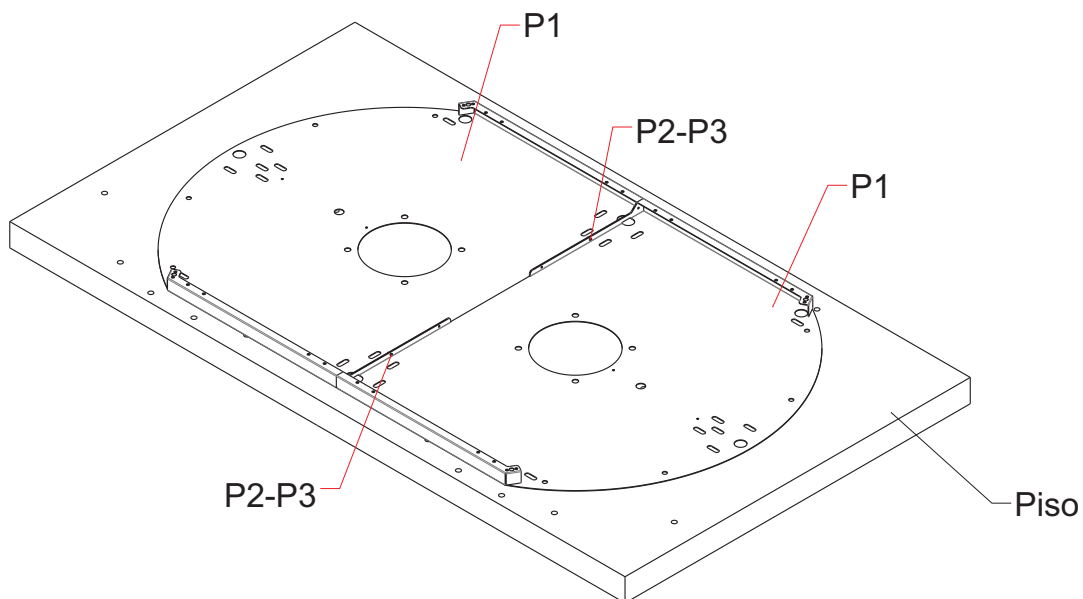
- 1 socket wrench with socket of 14 and 17mm
- 1 combination wrench 17
- 1 socket wrench 10 with extension
- 1 n.3 Allen wrench
- 1 n. 5 Allen wrench
- 1 medium-sized Philips screwdriver
- 1 medium-sized screwdriver
- 1 hard plastic hammer
- 1 plum-line or water level

6.2 Drilling device

- a. It will be necessary to add cardboard or bubble wrap under the device so not to damage the roof painting when using the drilling demarcations;
- b. Screw the device (P1) to the turnstile's roof (P1);
- c. Position the assembled parts in the area chosen for installation, observing the flow of entrance and exit;
- d. Observe the desired side for the opening (lock side) of the central support for maintenance;
- e. Place the roof (P1) and fix tem with screw (P2) and nut (P3)
- f. The pre-hole must be done with an Ø6mm drill, so there are no damages to the device's holes;
- g. Remove the device and drill again all the holes with an Ø14mm drill.



ATTENTION: *The place of installation and the direction of entrance and exit must be defined alongside the responsible for the place.*



Quantity of parts used in this stage:

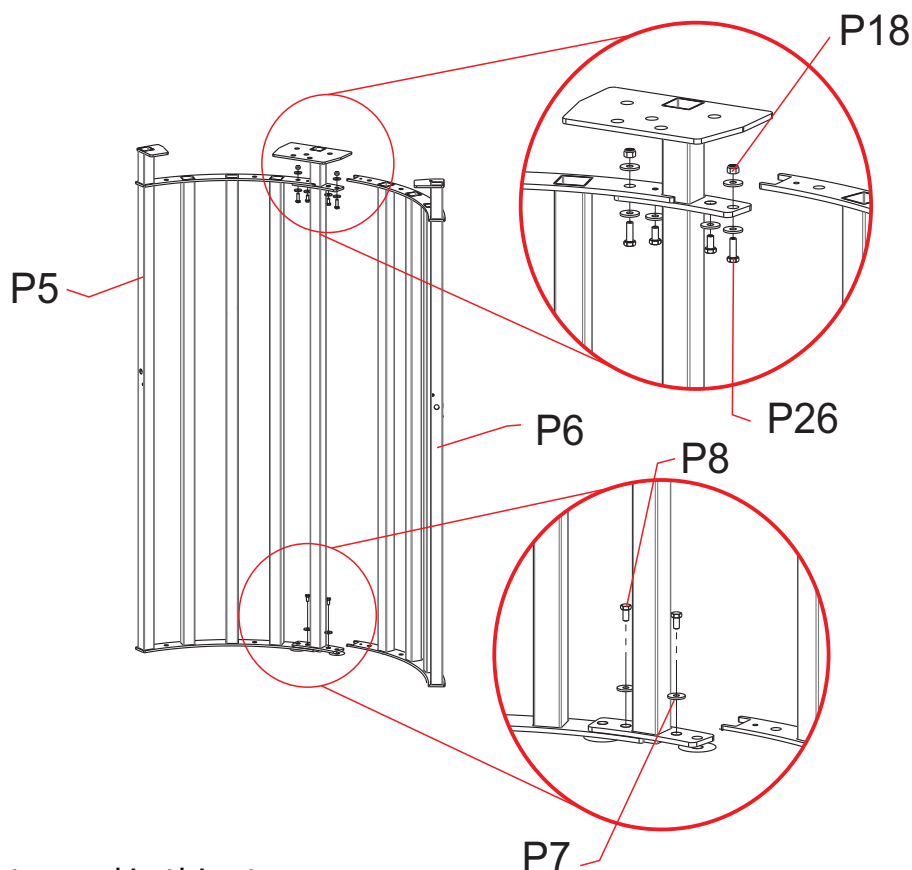
- P1 = 2x Roof
- P2 = 2x Allen screw M4x12
- P4 = 2x Nut M4

Obs.: After all demarcations, disassemble the device to use the part later (P1).

6.3 Assembly of sides with rods or glass sides

Sides with rods:

- Fit the sides (P5) and (P6) so to form an arch;
- Screw the sides using washer (P7) and screw (P8); repeat on the four fixing points (two on the upper part, two on the lower part);
- Place the screw (P26) with washers (P7) on both sides and on the nuts (P18) to finish the holes on the arch's upper part.



Quantity of parts used in this stage:

- P5 = 1x - 5 side rods
- P6 = 1x - 4 side rods
- P7 = 8x - Washer D=30,5 x 10,5 x 3mm
- P8 = 4x - Hexagon head screw M10 x 20
- P18 = 2x - Nut M10
- P26 = 2x - Hexagon head screw M10 x 30

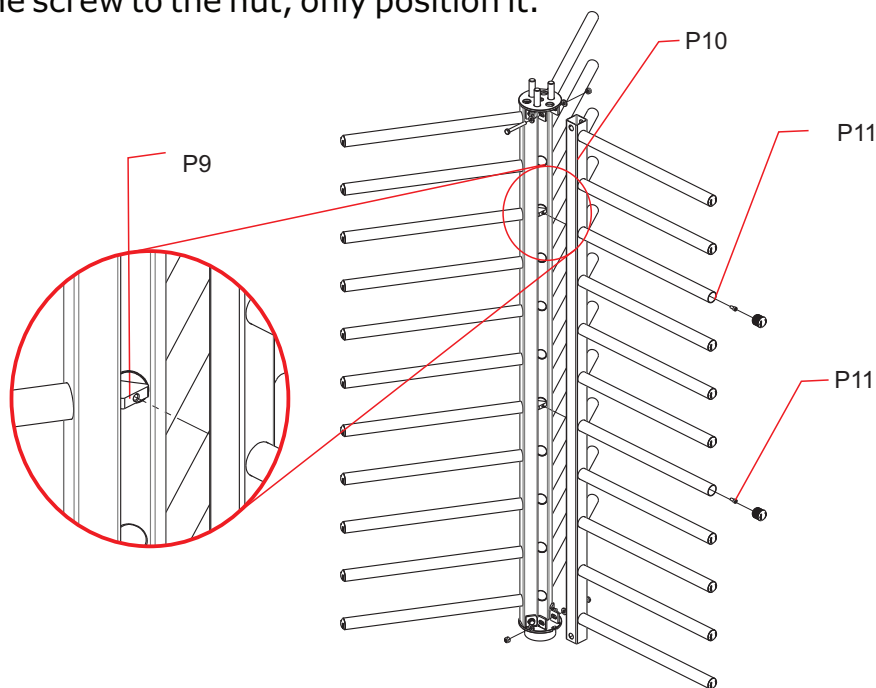
This assembly will result in the set (P23) – Assembling the arch's sides



INFORMATION: *Make this assembly twice, since the turnstile is double.*

6.4 Assembling central arms

- a.** Fix the inner triangle (P9) to one of the arms (P10) using the screw and the spring washer (P11); repeat it for the arm's two fixing points (P10). Fixing this part is done internally in the arms that have no buffer. Do not fasten the screw, simply position it.
- b.** Place the second arm (P10), fixing it to the inner triangle (P9) using the screw and the spring washer (P11). Repeat it for the arm's two fixing points (P10). Fixing this part is done internally in the arms that have no buffer. Do not fasten the screw, simply position it.
- c.** Place the third arm (P10), fixing it to the inner triangle (P9) using the screw and the spring washer (P11). Repeat it for the arm's two fixing points (P10). Fixing this part is done internally in the arms that have no buffer. Do not fasten the screw, simply position it.
- d.** Fit the lower base set (P14) to the lower part of the assembled arms (P10); place the washers (P17) 2x, screw (P16) 1x, and nut (P18) 1x in each of the holes 3x. Do not fasten the screw to the nut, only position it.
- e.** Fit the upper base set (P15) to the upper part of the assembled arms (P10); place the washers (P17) 2x, screw (P16) 1x, and nut (P18) 1x in each of the holes 3x. Do not fasten the screw to the nut, only position it.

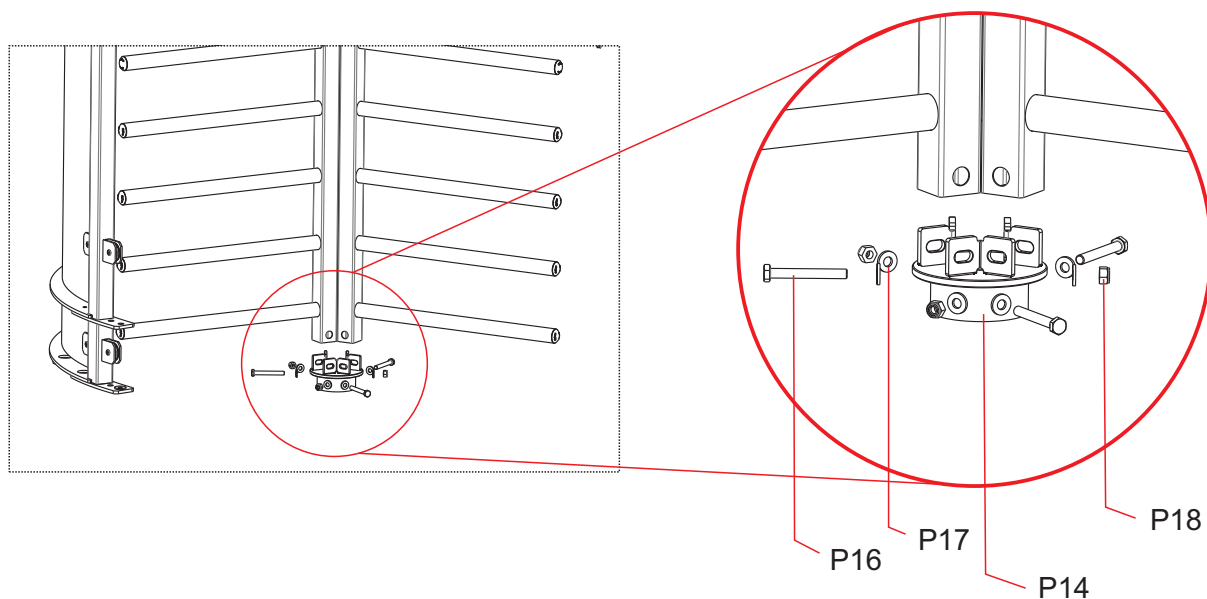


INFORMATION:

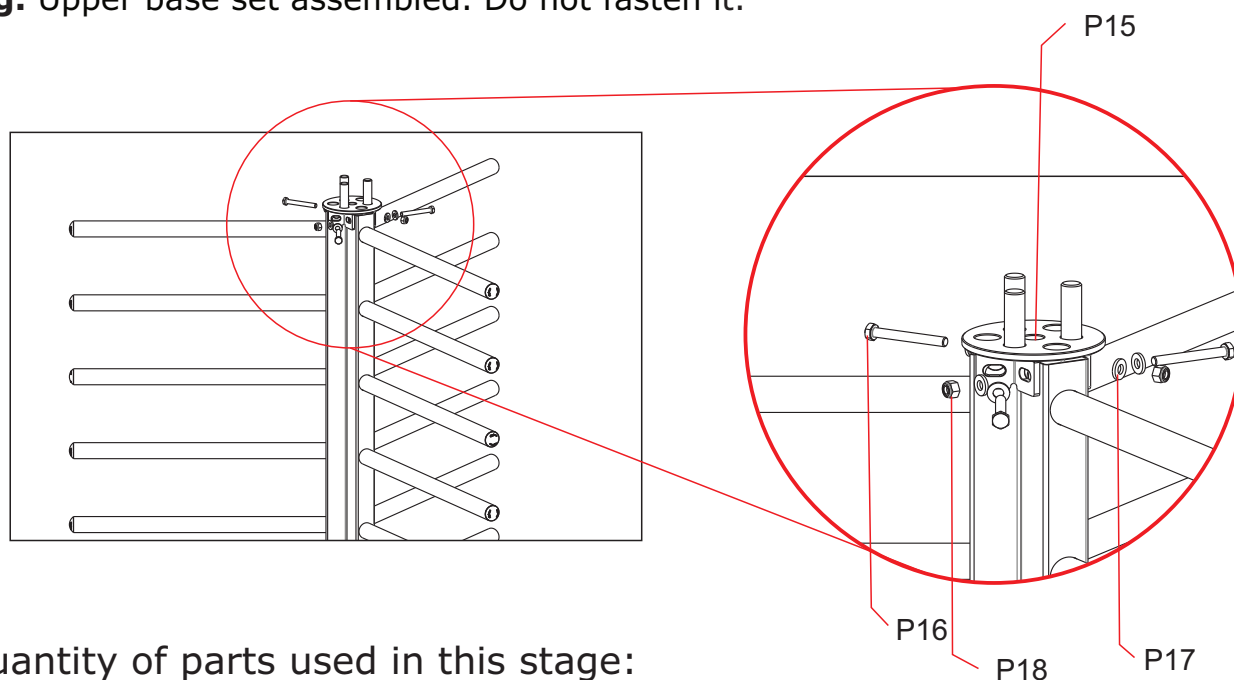
The position of the tube without buffer can alter according to the turnstile model.

Perform this assembly twice because the Turnstile is double.

f. Base set assembled. Do not fasten it.



g. Upper base set assembled. Do not fasten it.

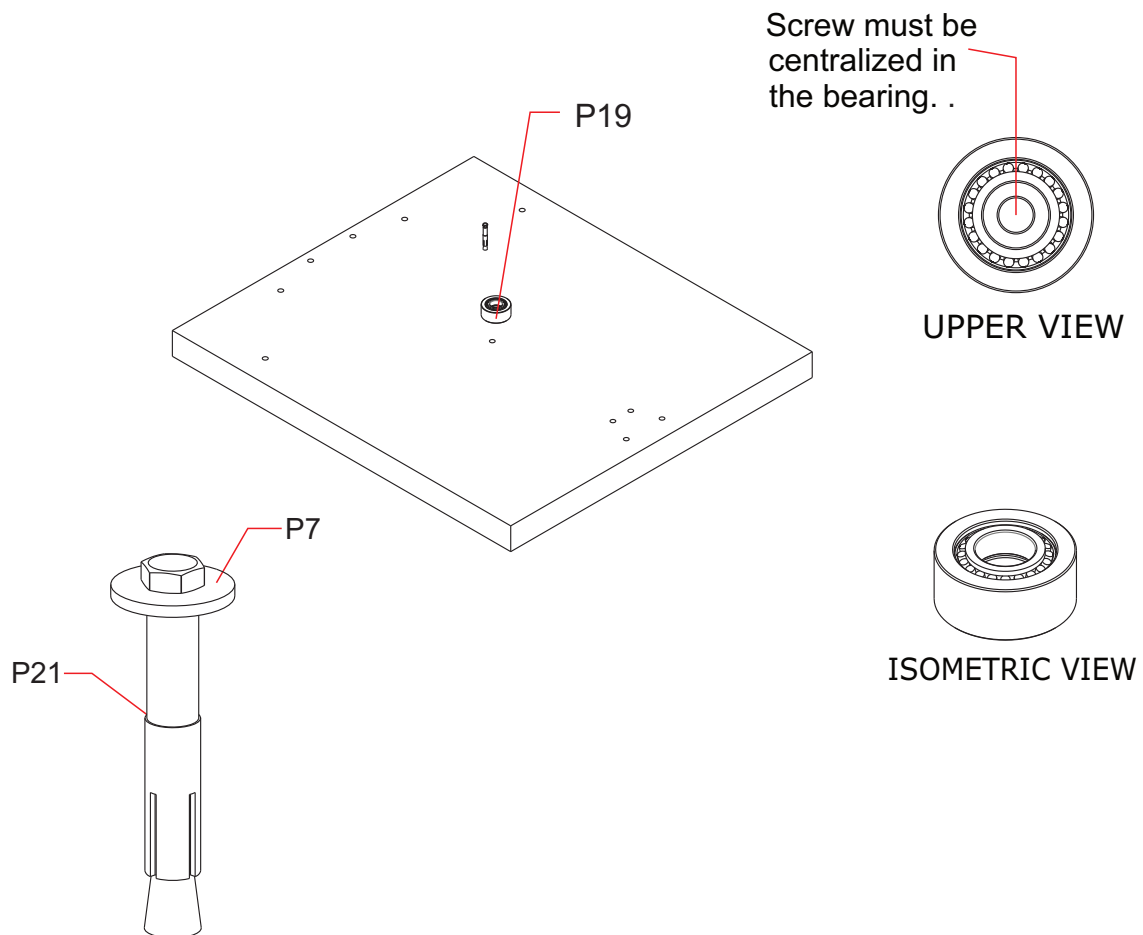


Quantity of parts used in this stage:

- P9 = 2x - Triangle
- P10 = 3x - Central arm
- P11 = 6x - Allen screw M8 x 10
- P14 = 1x - Lower base
- P15 = 1x - Upper base
- P16 = 6x - Hexagonal head screw M10 x 80
- P17 = 12x - Washer D=22 x 10,5 x 3mm
- P18 = 6x - Nut M10

6.5 Fixing the bearing support

- a. Replace the fastener's washer (P21) for the washer (P7);
- b. Use the fastener (21); does not accompany the product;
- c. Place silicone rubber under the bearing; then fix the bearing support (P19) to the central hole, as shown in the image.



Quantity of parts used in this stage:

- P7 = 1x - Washer D= 30,5 x 10,5 x 9mm
- P19 = 1x - Bering
- P21 = 1x - Fastener



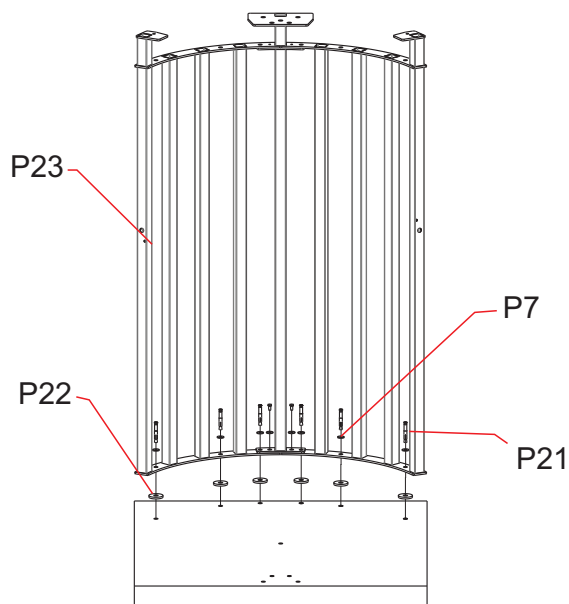
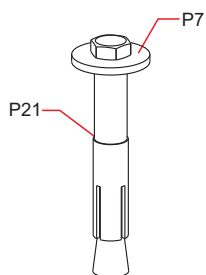
INFORMATION:

- *Add more Molykote grease to the bearing since the grease sent is for transport only.*
- *Repeat the operation above in the both rotating centers.*

6.6 Fixing the sides

Fixing the sides with rods:

- a. Set the coincident flanges (P22) in the holes of the floor;
- b. Align the assembly of the sides with grid (P23) over the flanges, coinciding with the holes;
- c. Replace the fastener's washer (P21) by the washer (P7);
- d. Place the fasteners (P21) in all fixing points;
- e. Level the rod and wedge the base with washers, if correction is necessary;
- f. Fasten all the screws.



Quantity of parts used in this stage:

- P7 = 6x - Washer D=30,5 x 10,5 x 3mm
- P21 = 6x - Fastener
- P22 = 6x - Flange
- P23 = 1x (Assembly obtained in step 3) - Assembly of arch's sides



INFORMATION: Perform this assembly twice because the turnstile is double.

6.7 Fixing the stationery arms

- a.** Position the arches (P50) and (P51) with the support (P49)
- b.** Fix them using the screws (P53), aligning the faces of the arches (P50) and (P51)
- c.** Fasten all the screws (P53)
- d.** Position the stationery arms (P52) on both sides
- e.** Fasten the screws in place (P53)

Quantity of parts used in this stage:

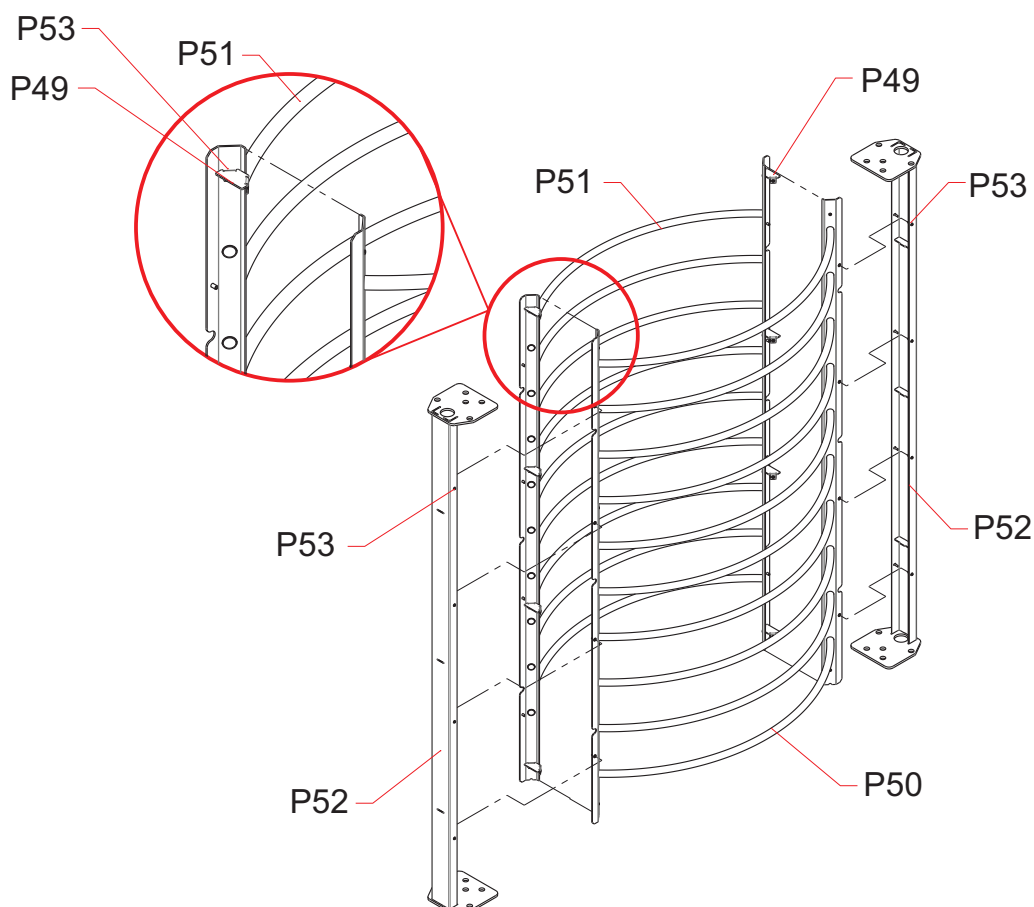
P49 = 8x - Support

P50 = 1x - Arch 1

P51 = 1x - Arch 2

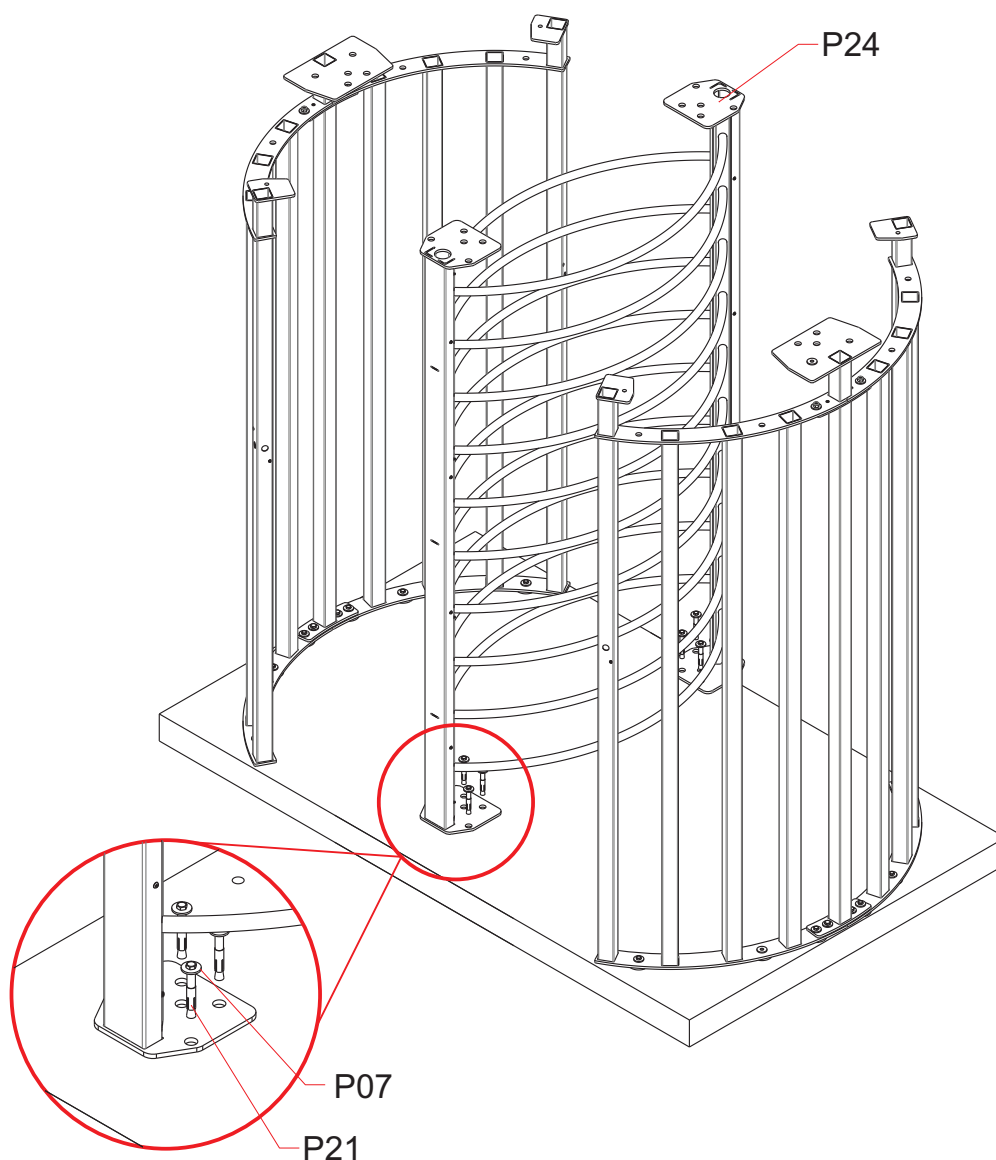
P52 = 2x - Stationery arm

P53 = 32x - Screw M5x20



6.8 Fixing the stationery arm

- Set the stationery arm (P24) over the flanges and coinciding holes;
- Replace the fastener's washer (P21) by the washer (P7);
- Place the fasteners (P21) in all fixing points;
- Fasten all the screws;
- Level the column and wedge it with washers, if necessary;
- Check if the arms are perpendicular to the floor's point of reference.

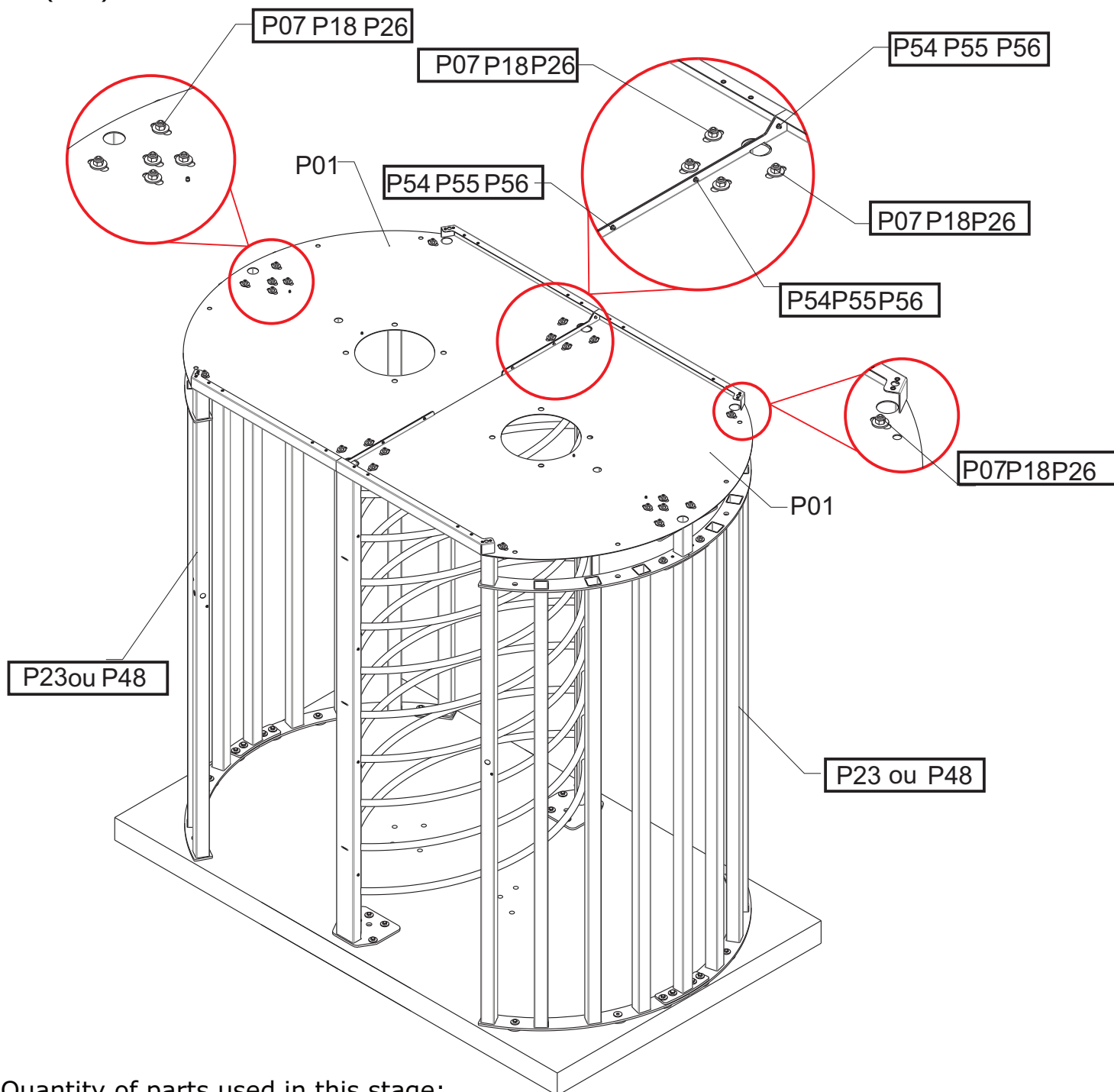


Quantity of parts used in this stage:

- P7 = 4x - Washer D=30,5 x 10,5 x 3mm
- P21 = 4x - fastener
- P22 = 4x - Flange
- P24 = 1x - Stationery arm

6.9 Fixing the roof

- Place the roofs (P1) over the sides (P23 or P48);
- Screw them in place, using in each fixation 2 washers (P7), screw (P26), and nut (P18). Place the screw from the bottom upwards.
- Screw the roofs between themselves using 2 washers (P54) to fix them, screw (P55), and nut (P56).

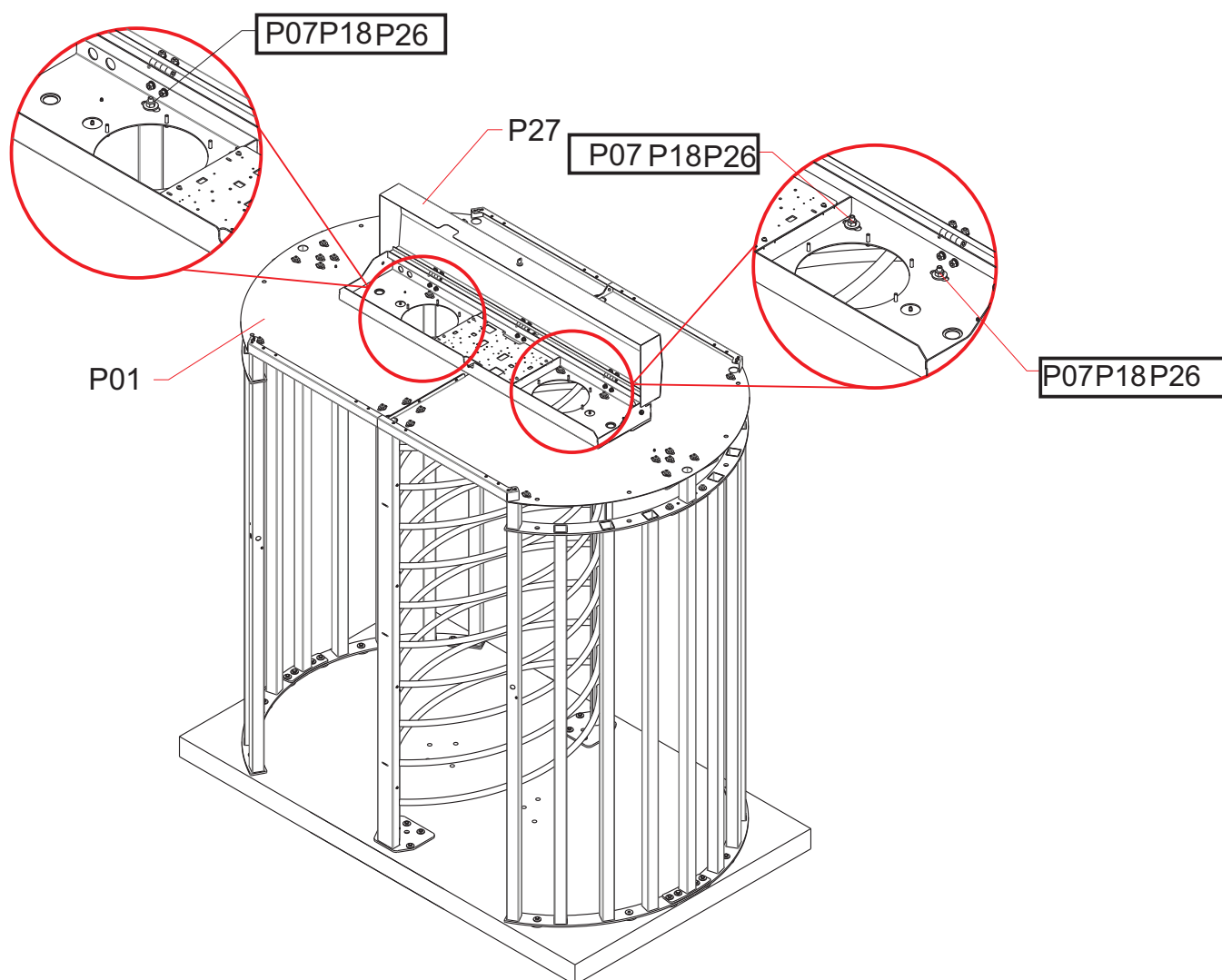


Quantity of parts used in this stage:

- P1 = 1x - Roof
- P7 = 4x - Washer D=30,5 x 10,5 x 3mm
- P18 = 2x - nut M10
- P26 = 2x - Hexagonal head screw M10 x 30
- P23 = Side assemble with rods
- P48 = Side assemble for glass
- P54 = 12x - washer M4
- P55 = 6x Allen screw M4x12
- P56 = 6x nut M4

6.10 Fixing the coverage

- a.** Check the height from the floor to the upper part of the roof (P1) – 2.1 meters with tolerance of 5mm;
- b.** Place the turnstile coverage (P27) over the roof (P1) and the stationery arm (P24);
- c.** In each fixation, use 2 washers (P7), screw (P26), and nut (P18). Obs.: place the screw from the bottom upwards. Do not fasten it.
- d.** After aligning, fasten the screws in all the fixing points of the turnstile coverage (P27).

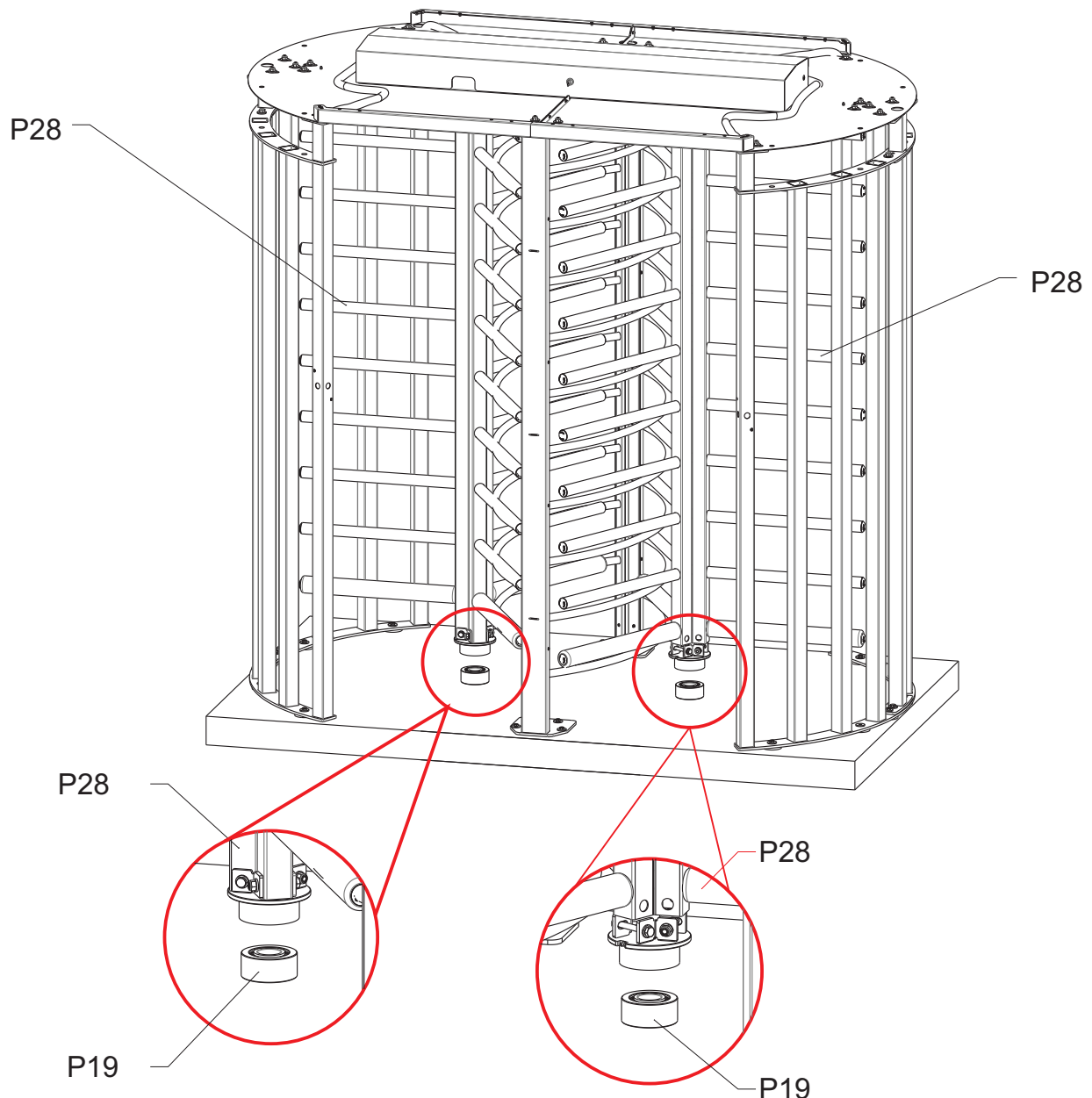


Quantity of parts used in this stage:

- P7 = 16x - Washer D = 30,5 x 10,5 x 3mm
- P18 = 8x - Nut M10
- P26 = 8x - Hexagonal head screw M10 x 30
- P27 = 1x - Coverage

6.11 Fitting of central pivoting arm

- a. Grease the bearing support (P19). (We recommend Molykote BR-2 Plus grease;
- b. Fit the central arms assembly (P28) in the bearing support (P19). In this stage, the assembler or mechanic cannot drop the central arms assembly, so we suggest an auxiliary assembler or to tie the central arm to the structure;
- c. Align one of the line of arms to the stationery arms, as shown in the image.

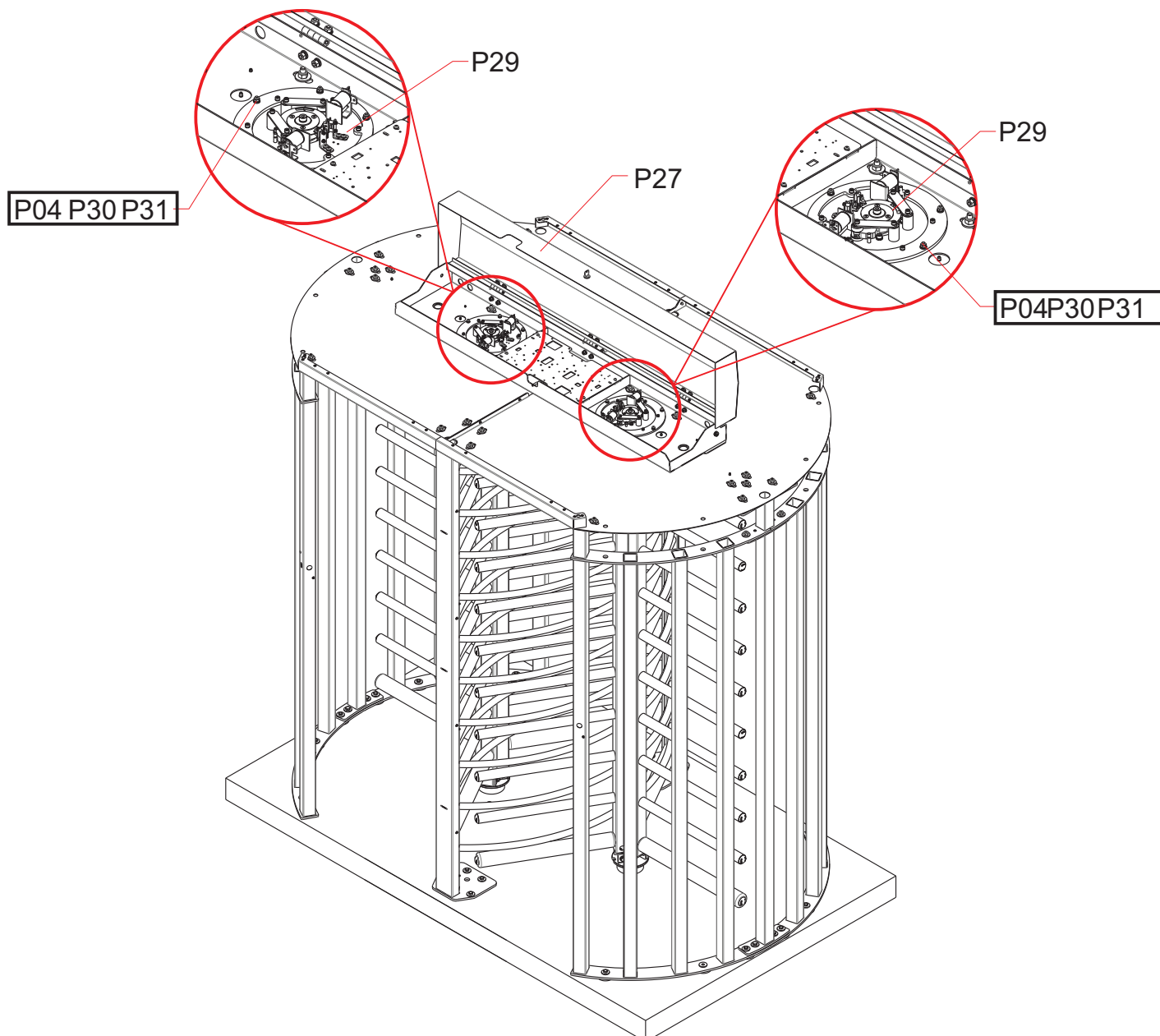


Quantity of parts used in this stage:

- P28 = 2 sets (Assembly obtained in the 4th step of this Manual) – Central arm

6.12 Fitting of locking system

- a. Fit the locking system (P29) in the pivoting arm assembly (P28), maintaining the arms' alignment, as seen in the 10th step; fit it in the coverage (P27);
- b. Fit the locking system (P29) with washer (P30), spring washer (P31), and nut (P32). 6 fixings;
- c. After the locking system (P29) is fixed (and only then), rotate the pivoting arm several times to settle the bearing supports and fasten all the screws in the pivoting arm assembly (P28).

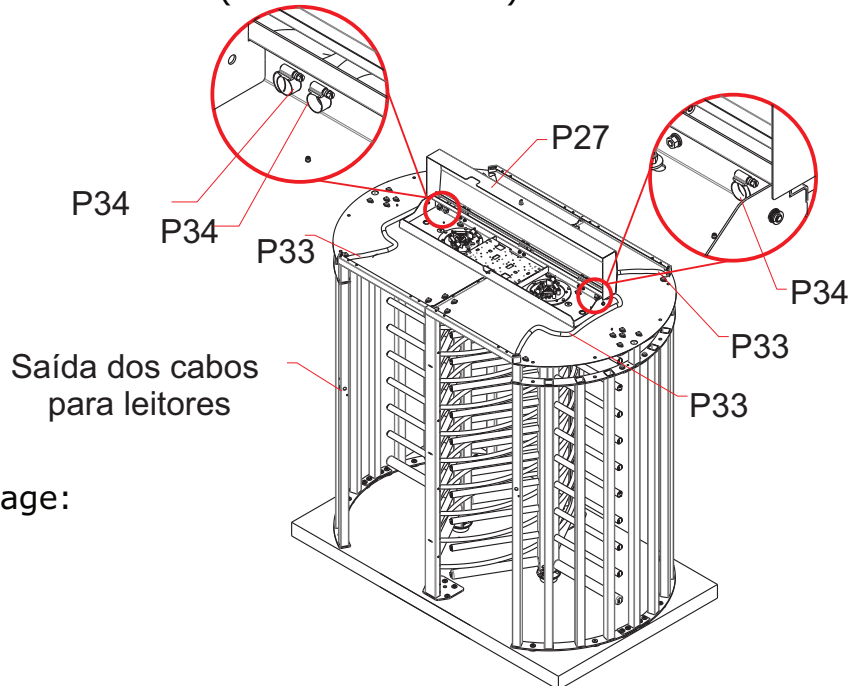


Quantity of parts used in this stage:

- P29 = 2x – Locking system
- P30 = 12x – Flat washer D6
- P31 = 12x – Spring washer D6
- P4 = 12x - Nut M6

6.13 Cable passage

- a. Pass the power and network cables through a hose (P33);
- b. Put one of the hose's ends (P33) inside the coverage (P27) and the other end inside the side structure (P23 or P48);
- c. Inside the coverage (P27), place the clamp (P34) on the hose's end (P33) to avoid it being torn;
- d. Repeat the procedure above on both sides (entrance and exit) of the turnstile.

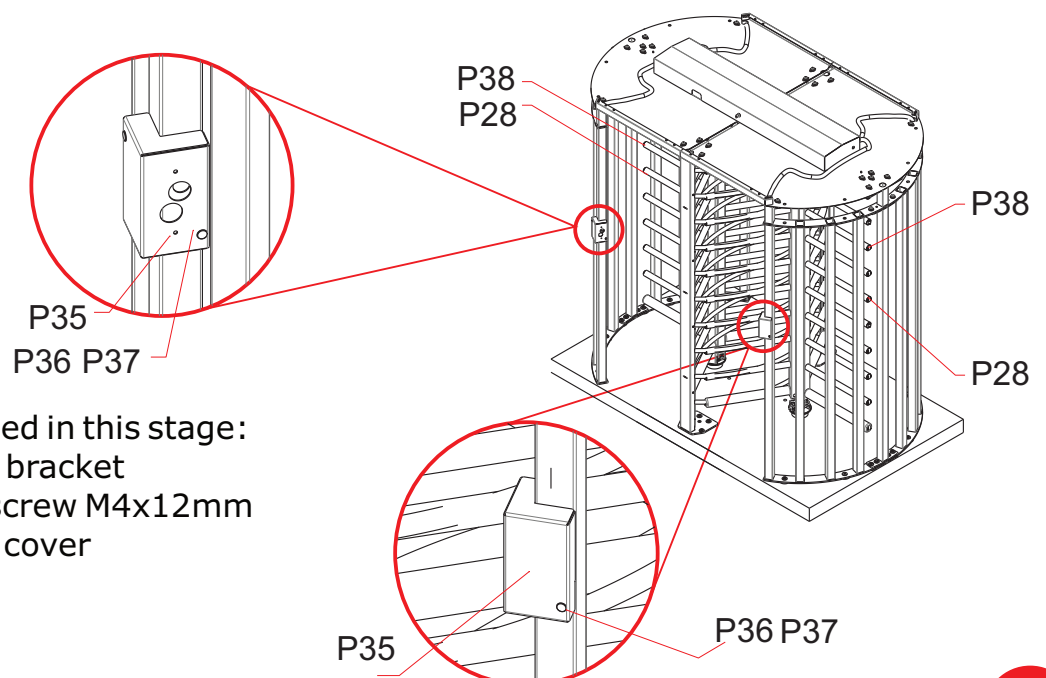


Quantity of parts used in this stage:

- P33 = 4x - Hose
- P34 = 4x - Clamp

6.14 Assembling the card reader bracket

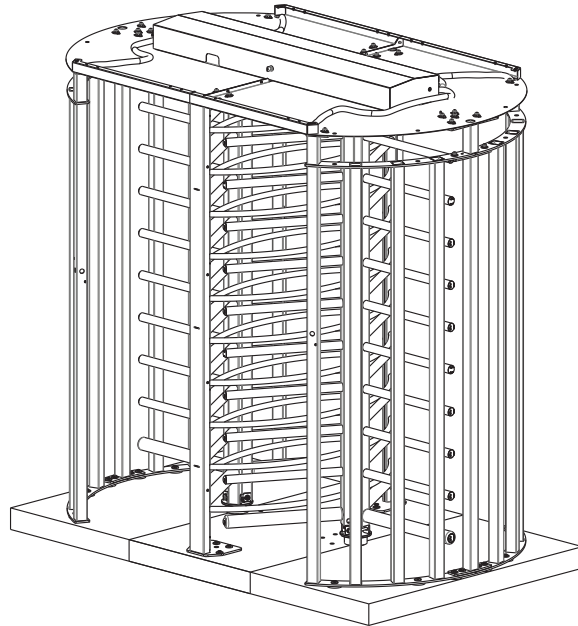
- a. Fix the card reader bracket (P35) with a screw (P36); repeat on both sides;
- b. Place the cowl cover (P37) in all holes, 4x in each bracket;
- c. Place the arms cover (P38) in the arms assembly (P28).



Quantity of parts used in this stage:

- P35= 4x - Reader bracket
- P36= 8 x - Allen screw M4x12mm
- P37= 16 x - Cowl cover

6.15 Turnstile assembled



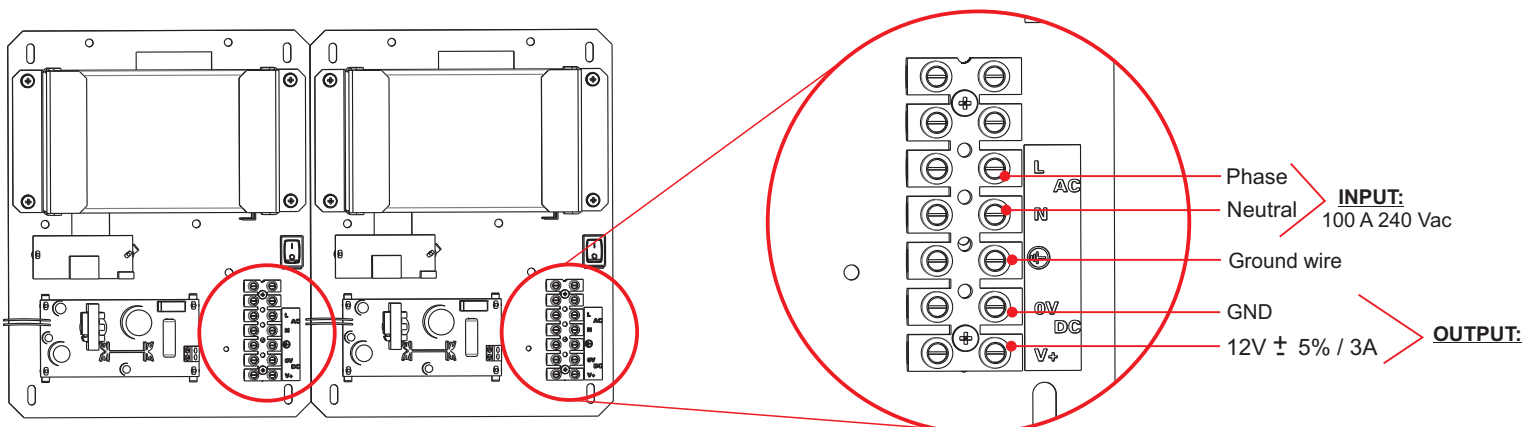
Turnstile with Grid (gray, blue, and stainless steel)

7. Optional Items

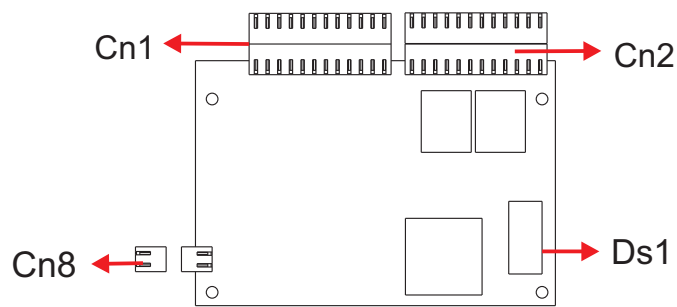
7.1 Power supply

This power supply kit was especially designed for the line Turnstiles. Among the main advantages of this optional item, is its adaptation capability to the voltage variations often found in installation sites – the input voltage can vary between 100 and 240 Vac. The version with battery (no-break) is responsible for the supply maintenance of Duo, even without power. The no-break has a 12Vdc/9A battery, allowing autonomy of up to 4 hours (in case power failure).

The supply's specific technical features, protections and dimensions were carefully tested and approved in hostile temperature and environmental conditions, which ensures the adequate power supply to the equipment's performance.



7.2 Control board



Turnstile Duo's control board was designed to meet most technologies of access control terminals in the market. The controller have mechanical features and layout perfectly suited for the Turnstile Duo's needs and it is one of the best options for the equipment's operation.

The following images show the control board with its straps, connectors, and dipswitch, as well as the location of the power supply and the control board.

The table below describes the functions of the control board's connectors:

<u>Signal</u>	<u>Name/Description</u>
CN1	INPUTS
1	+Vext1 (enables turn through voltage)
2	HAB1 (enables turn through dry contact – from right to left)
3	GND
4	Vext2 (enables turn through voltage)
5	HAB2 (enables turn through dry contact – from left to right)
6	GND
7	+12Vdc (available to auxiliary – maximum 500 mA)
8	CLOCK1 (input for reader from left to right)
9	DATA1 (input for reader from left to right)
10	CLOCK2 (input for reader from right to left)
11	DATA2 (input for reader from right to left)
12	GND
13	PROG1 (programs direction)
14	PROG2 (programs direction)
15	PIC1 (controls frontal pictogram 1)
16	PIC2 (controls frontal pictogram 2)
CN2	OUTPUTS
1	NO or NC Contact (HAB1 return)
2	Contact C (HAB1 return)
3	NO or NC Contact (HAB2 return)
4	Contact C (HAB2 return)
5	Output for indicative X (open collector NPN – maximum 500 mA) orange wire
6	Output for arrow > (open collector NPN – maximum 500 mA) blue wire
7	Output for arrow < (open collector NPN – maximum 500 mA) green wire
8	+12Vdc (indicative arrows' power) red wire
9	GND (indicative arrows' power) black wire
10	+ solenoid of badge collector box
11	- solenoid of badge collector box
12	Sound signal (open collector – NPN)
CN3	SERIAL RS-485
1	DATE -
2	DATE +
3	GND
CN4	SIDE PICTOGRAM 2
1	+12Vdc (indicative arrows' power)
2	Output for indicative X (open collector NPN – maximum 500 mA)
3	Output for arrow > (open collector NPN – maximum 500 mA)
4	GND (indicative arrows' power)
CN5	SIDE PICTOGRAM 1
1	+12Vdc (indicative arrows' power)
2	Output for indicative red arrow (open collector NPN – maximum 500 mA)
3	Output for green arrow (open collector NPN – maximum 500 mA)
4	GND (indicative arrows' supply)
CN6	INPUT/OUTPUTS
1	input or output 1 – configure at S4 (IN or OUT)
2	input or output 2 - configure at S5 (IN or OUT)
3	GND
4	+12Vdc
CN7	SERIAL RS-232
2	TX
3	RX
5	GND
CN8	POWER – POWER INPUT
1	+12Vdc power input
2	GND power input
CN9	BOX SENSOR
1	LED anode
2	box signal
3	GND
4	GND
CN10	ELECTROMAGNETS
1	+ electromagnet 1
2	- electromagnet 1
3	+ electromagnet 2
4	- electromagnet 2
CN11	OPTICAL SENSORS
1	sensor 1 signal
2	LED 1 anode
3	sensor 2 signal
4	GND
5	LED2 anode



INFORMATION:

- Side pictogram 1 and 2 refer to the devices located on top of the equipment.
- The cables of the optical sensors (CN11) and the electromagnets (CN10) are provided alongside Duo.
- The cable of the box sensor (CN9) is provided alongside the collecting box kit (optional).

Particularly about the CN11 connector, pins 13 and 14: Turnstile Duo can be configured as follows to determine direction passage:

Passage direction	PROG1 (pin 13)	PROG2 (pin 14)
Free in both directions	Open	Open
Controlled from left to right	GND	Open
Controlled right to left	Open	GND
Controlled on both sides	GND	GND

Pins 15 and 16, which control the side pictograms, must be configured thusly:

PIC1 (pin 15)	PIC2 (pin 16)	Pictogram 1	Pictogram 2
Open	Open	Green arrow	Green arrow
Open	GND	Green arrow	Red arrow
GND	Open	Red arrow	Green arrow
GND	GND	Red arrow	Red arrow

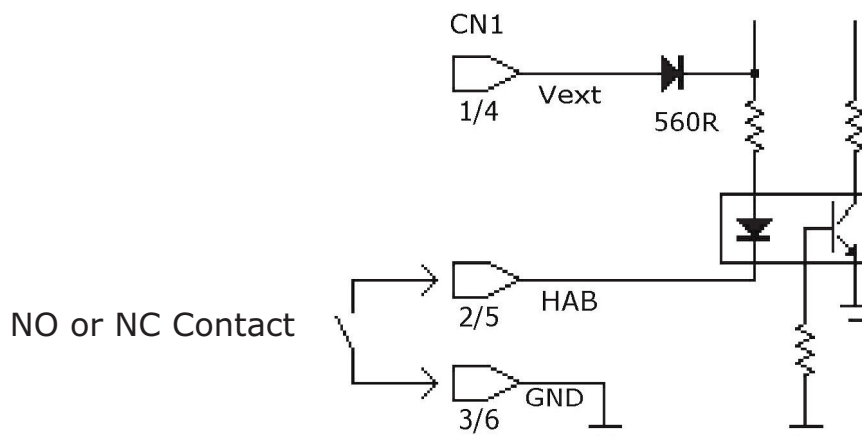


INFORMATION: PIC1 and PIC2 refer to the pictograms located on each side of the equipment.

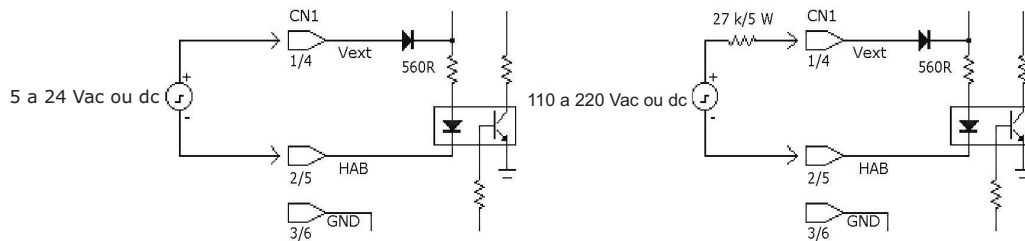
The following sections concern important aspects of the control board configuration and connections of Duo.

7.2.1 Inputs

The input signals or passage clearance (HAB1 and HAB2) can be originated by a relay contact, pushbutton contact, tension from 5 to 24 Vac/dc, from 110 to 220 Vac/dc. To enable passage through relay contact or pushbutton, make the connection as shown below:



Enabling passage through tension pulse is shown in the image below. It is necessary to observe the polarity of the Vdc voltages and to use an external resistor for high voltages (110V and 220V).



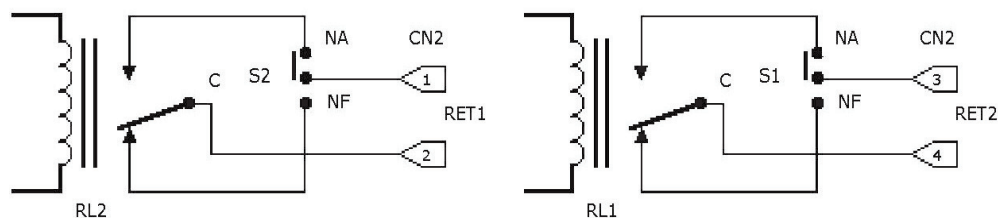
The control board also has inputs for optical sensors (CN11) that monitor rotation without mechanical wear, and two opto-isolated inputs to clear the Turnstile Duo if required.

7.2.2 Outputs

Turnstile Duo's board has outputs for return signals, electromagnets, pictogram, collecting box, and sound alarm.

• Return signals

Return signals indicate the moment and direction of passage and are originated at the relay – normally open contact (NO) or normally closed contact (NC). Connect the outputs according to the image below:



• Electromagnets

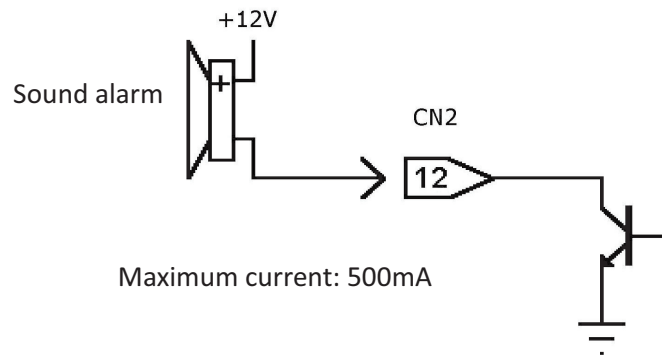
Electromagnets are activated for blocking the turnstile. Opposite to the traditional solenoids, electromagnets do not cause abrasion between the coil and the locking device, avoiding malfunctions. Moreover, the activation is done through a transistor, and not a relay, avoiding the electromagnet to be blown due to the “contact welding” (there is no mechanical wear).

• Sound alarm

The sound alarm output is activated by a NPN transistor (maximum 500 mA) every time that Turnstile Duo:

- Receives a clearance signal (two short rings)
- Is not cleared and is forced during 1 second (1-second rings)
- Is stuck mid-turn for over 2 seconds (1-second rings)

Connect the outputs according to the following image:



7.3 Configuration of control board – Switch Ds1

The switch (or dipswitch) DS1 allows programming the following actions:

- passage direction
- Maximum time for turns
- NO inputs (relay or pushbutton contact normally open and without input voltage), enabling passage in face of these signals; or NC inputs (relay or pushbutton contact usually closed and with input voltage), enabling passage in the absence of these signals.
- enabling of a signal for a sound alarm if the access control remains at mid turn for more than 5 seconds.

To program DS1, put each pin in the desired position, according to the table below.

	01	02	03	04	05	06	07	08
Cleared in both directions	-	-	-	OFF	OFF	-	-	-
Blocked from left to right	-	-	-	ON	OFF	-	-	-
Blocked form right to left	-	-	-	OFF	ON	-	-	-
Blocked in both directions	-	-	-	ON	ON	-	-	-
NO inputs	-	ON	-	-	-	-	-	-
NC inputs	-	OFF	-	-	-	-	-	-
Enables sound signal	ON	-	-	-	-	-	-	-
Disables sound signal	OFF	-	-	-	-	-	-	-
Enables sound signal in mid-turn	-	-	-	-	-	ON	-	-
Disables sound signal in mid-turn	-	-	-	-	-	OFF	-	-
Wait until first turn	-	-	-	-	-	-	ON	ON
Wait for 5 seconds	-	-	-	-	-	-	OFF	ON
Wait for 10 seconds	-	-	-	-	-	-	ON	OFF
Wait for 15 seconds	-	-	-	-	-	-	OFF	OFF
Habilitation per border*	-	-	OFF	-	-	-	-	-
Habilitation per level**	-	-	ON	-	-	-	-	-

* "Habilitation per border" means that will be enabled by a pulse at the entry border (NC inputs) or exit border (NO inputs).

** "Habilitation per level" means that will remain free as long as there is an input signal.

7.4. Examples of configurations

1 - To receive a relay pulse (NO contact), clear the turning and wait to turn for 10 seconds:

	1	2	3	4	5	6	7	8
Configuration	-	ON	OFF	ON	ON	-	ON	OFF

2 - To leave the clockwise direction always cleared and, when the HAB2 (anti-clockwise) clearance signal is received, clear passage for undetermined period:

	1	2	3	4	5	6	7	8
Configuration	-	ON	OFF	OFF	ON	-	ON	ON

3 - To clear the turning while the relay has the contact closed and, as soon as the relay contact is open, remove clearance:

	1	2	3	4	5	6	7	8
Configuration	-	ON	ON	ON	ON	-	ON	ON

7.5. Serial communication

Turnstile Duo's control board allows serial configuration of the equipment. The communication protocol used is as follows:

STX	Tamanho(LSB)	Tamanho(MSB)	Comandos	BCC
-----	--------------	--------------	----------	-----

Where:

- STX represents beginning of transmission (0x02)
- Size(LSB) is the byte with the least significant size component
- Size(MSB) is the byte with the most significant size component
- Commands is the information sent to the equipment (one or two bytes);
- BCC is the XOR operation for all bytes sent, from STX to Commands



ATTENTION:

- Size corresponds to the number of bytes sent (total command bytes: 1).
- The protocol communication rate is 115,200 bps.

The following table shows the enabling commands that can be sent to Turnstile Duo:

HEXA	ASCII	FUNCTION
0x48	H	Clears direction from right to left
0x41	A	Clears direction from left to right
0x44	D	Clears both directions
0x43	C	Back to controlling (command used to leave free state)
0x4C	L	Turnstile free (include free direction <0x4C> + <0x48>)
0x53	S	Direction programming (include direction to be programmed <0x53> + <0x48>)

The following table shows the return commands that can be sent by the equipment:

HEXA	ASCII	FUNCTION
0x48	H	free from right to left
0x06	▲	ACK, indicates command OK
0x15	§	NACK, indicates invalid command
0x1A	→	Return command form right to left (RET1)
0x1B	←	Return command from left to right (RET2)

The following table shows some examples of command:

Free from left to right (1 passage):

0x02	0x02	0x00	0x48	0x48
------	------	------	------	------

Configure from left to right as always free:

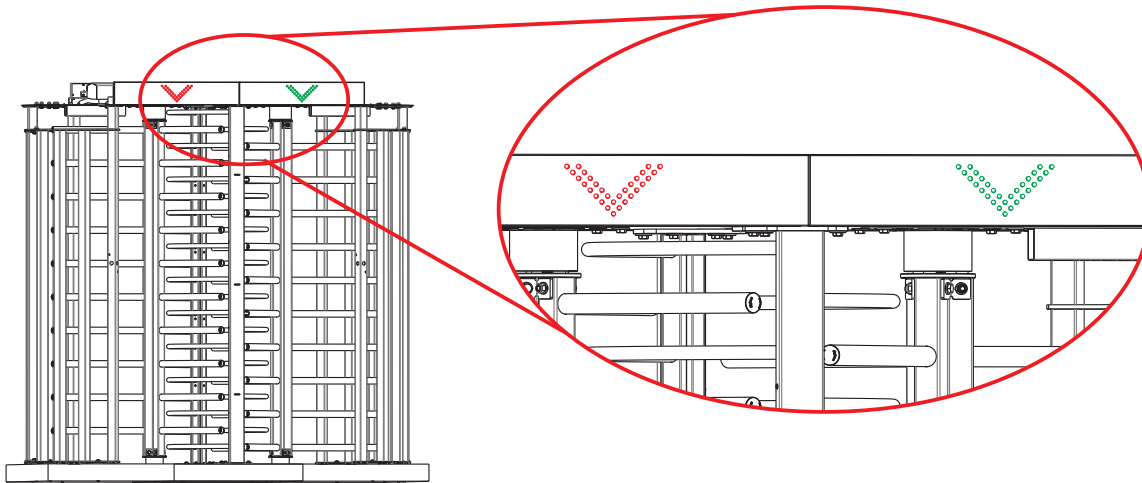
0x02	0x03	0x00	0x4C	0x48	0x05
------	------	------	------	------	------

Return OK command:

0x02	0x02	0x00	0x06	0x06
------	------	------	------	------

7.6 Orientation pictogram kit

The orientation pictogram kit also visually signals passage direction (through green arrows) and its blockage (red arrows), but in the front/side of the Duo.

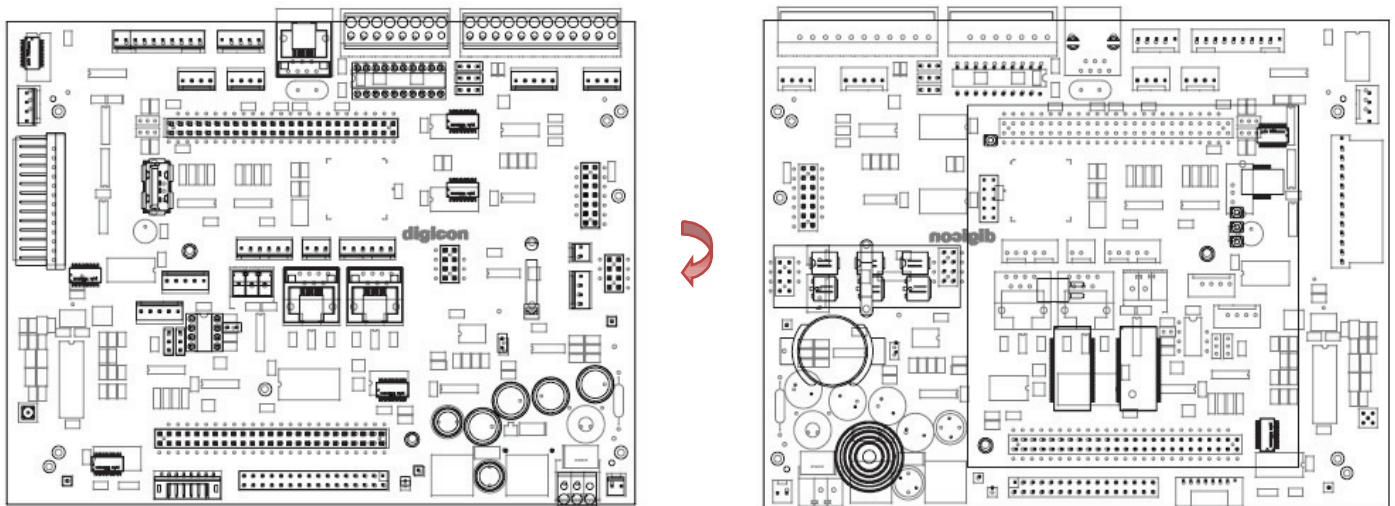


ATTENTION: *The power supply does not have a ground wire. Grounding must be done directly in the turnstile, using the fixing screw of the board's support.*

8. MCA Module

MCA was developed aiming at facilitating and empowering the task of integrating control systems that require processing power, fast manipulation and data transfer, flexibility in the choice of added technologies, and mainly independence from the manufacturer when developing, altering, and updating applications.

Presenting input and output interfaces destined to activating devices of power, sensor readings, contactless card readings, serial communication, and Ethernet, MCA is based on a platform that uses a Motorola Power PC XPC850 processor as engine with Linux operational system.



8.1 Powering up Duo

The MCA module of TDuo has an 10 base T Ethernet connection, used to communicate with the access managing system. As described in this manual, it is necessary to connect Duo to the power network.

In this chapter, we approach the initialization and configuration processes of Duo, necessary to communicate with the managing system.

8.1.1 Initializing Tx1500 Duo

Duo has visual devices (pictograms) that are also used to identify the correct system initialization. During this process, the orientation pictograms remain with the red arrow on.

After initializing the MCA board (about one minute), the orientation pictograms must display a green arrow. In this condition, Duo is ready for use.



ATTENTION: *The items mentioned before concern the Digicon Firmware. If the equipment has another firmware, consult the manufacturer/developer to know about the signals presented during the application's initialization .*

8.1.2 Configuring the Digicon Firmware

To execute the network configuration of Duo, it will be necessary to use the MCA programmer (device with display and keyboard – sold separately).

With the programmer duly installed and connected to the MCA module, turn the equipment on. When the countdown appears, press "ENTER" to access the network configurations of Duo. Use the number keys to enter the desired values and confirm the configurations with the 'ENTER" key. To correct a wrongly entered number, press the key "CANCEL". The parameters required during the configuration are:

a) Identification = number of up to 9 (nine) digits that should represent the unique identification in the network for the device registered in the system.

Identifier:
0 0 0 0 0 0 0 0 0

b) Configuration mode of IP in the fixed network (1) or (2) DHCP.

1 - IP FIXO 2 - DHCP 0

If the choice is fixed:

1. Device IP = IP in the format XXX.XXX.XXX.XXX. Example: if the IP is 10.10.5.120, inform "010.010.005.120";

IP Address 000.000.000.000

2. Subnet mask

Net mask 000.000.000.000

3. Network Gateway

Gateway 000.000.000.000

c) Server IP.

Server IP 000.000.000.000

d) Communication door.

Server door
00000

e) Confirmation of configurations, being (1) OK e (2) Cancel.

1- OK 2- Cancel
0

f) When configurations are finished, the following message will appear:

BLOCKED
21/02/13 14:57 :



INFORMATION: *When the message is BLOCKED, it means that a configuration is missing or a blocking command was sent.*

9. Maintenance:

9.1 Preventive and corrective routine maintenance

Sphere base – Periodicity: every 700,000 cycles
The wear of the spheres' track must be checked

Corrective actions:

1. In case of excessive wear (chipping, perforations, fillings or grooves where the sphere turns) replace the part.
2. If the part presents no wear, clean it and grease it using bearing grease.

Optical sensors – Periodicity: Once a year or more (depending on environmental conditions)

This routine maintenance requires the use of a multimeter. To check for the need of corrective actions, you must measure the CN11 with the controller turned on, according to the instructions:

-In the multimeter, select the Vdc measuring voltage of up to 20Vac. Then, place the black pointer on pin 4 and the red pointer on pin 1 of the CN11. Voltage should be lower than 0.8Vdc (non-obstructed sensors). With the pointers at the same position, force the equipment's arms to both directions (in one of the sides, the voltage should be higher than 4.5Vdc).

-Repeat the same operation, this time placing the black pointer on pin 4 and the red pointer on pin 3 of the CN11. The results should be the same obtained with pins 4 and 1.

-Check the sensors for signs of dust.

Corrective actions:

- 1.If measurements are not according the data above, replace the faulty sensor.
- 2.Clean the sensors using a clean brush.



TIP: If the environment presents excessive dust, execute this maintenance routine more often.

Electromagnets – Periodicity: ever 7000,000 cycles

This routine maintenance requires the use of a multimeter. To check for the need of corrective actions, disconnect the CN10 from the access control board and check the electromagnets' resistance. The value must be between 12.5 and 13.5 ohms between pins 1 and 2 and 3 and 4 of the electromagnet's connector. After measuring, connect CN10 to the board again

Corrective actions:

1. if you spot an incorrect resistance, a short-circuit or open electromagnet, replace it.
2. if the electromagnet is not working, check the board or the voltage
3. if the electromagnet is moving, fasten the base screws.

Electromagnets adjustments (if necessary)

1. Force the lock against the sprocket and the equipment's arm until the lock is completely inside the first teeth (until the arm is locked)
2. then, release the fixing screws and press the electromagnet against the lock's frame, so that its area is completely against the electromagnet
3. refasten the screws

Set of locks – Periodicity: every 700,000 cycles

To check for the need of corrective actions, you must:

- check the lock's correct position
- check the wear of the lock's fitting in the sprocket

Corrective actions

1. if the lock's position is incorrect, check the retaining ring and the spring that tightens the set
2. if the lock's fitting to the sprocket is incorrect, replace the lock or the sprocket
3. if lock's end is worn, replace the lock

Sprocket set – Periodicity: every 700,000 cycles

To check for the need of corrective actions, you must:

- check the wear of the sprocket's teeth
- check the gap between the central axis, the sprocket, and the keyway

Corrective actions

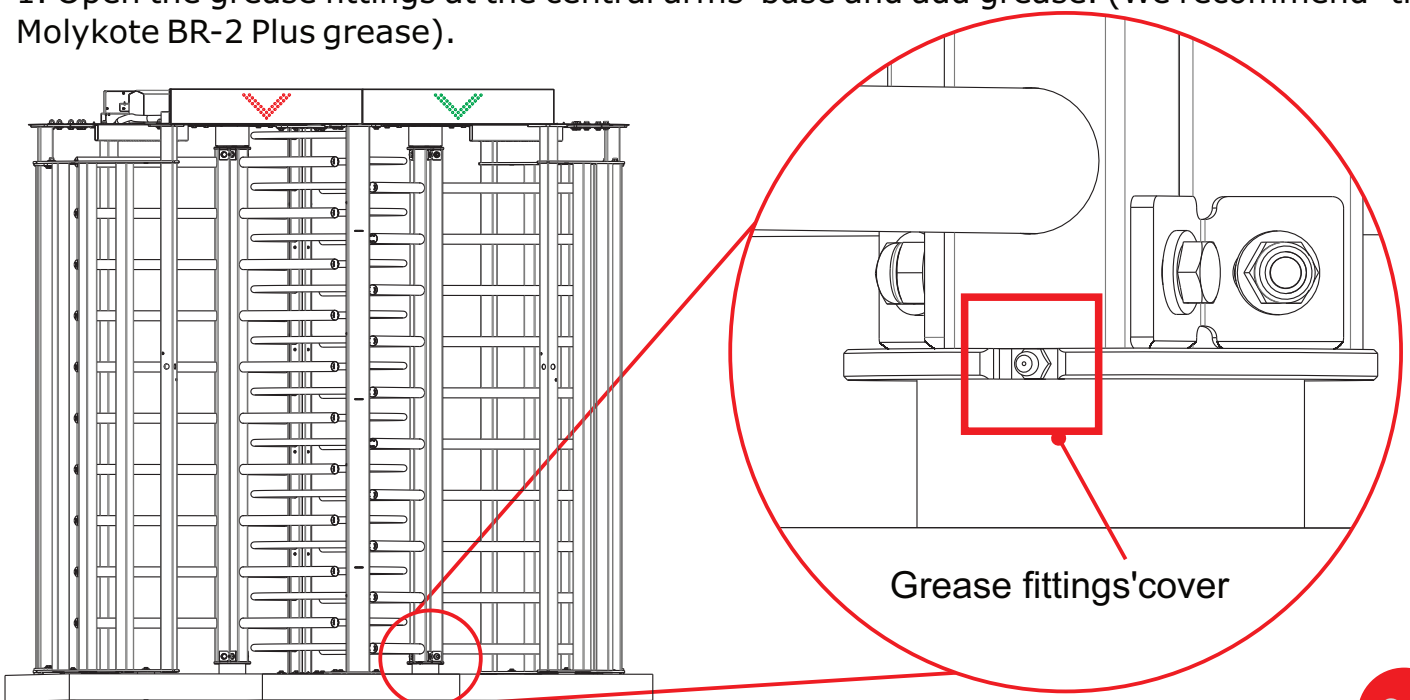
1. if you observe wear on the parts' teeth, replace the parts
2. if you see a gap between the sprocket and the axis/keyway set, replace the sprocket or the keyway (to replace the sprocket, use a pulley puller)

Arms' bearings – Periodicity: every 6 months

This maintenance routine works for lubricating the central arms' bearings. The central arms cannot be heavy for the users.

Preventive actions:

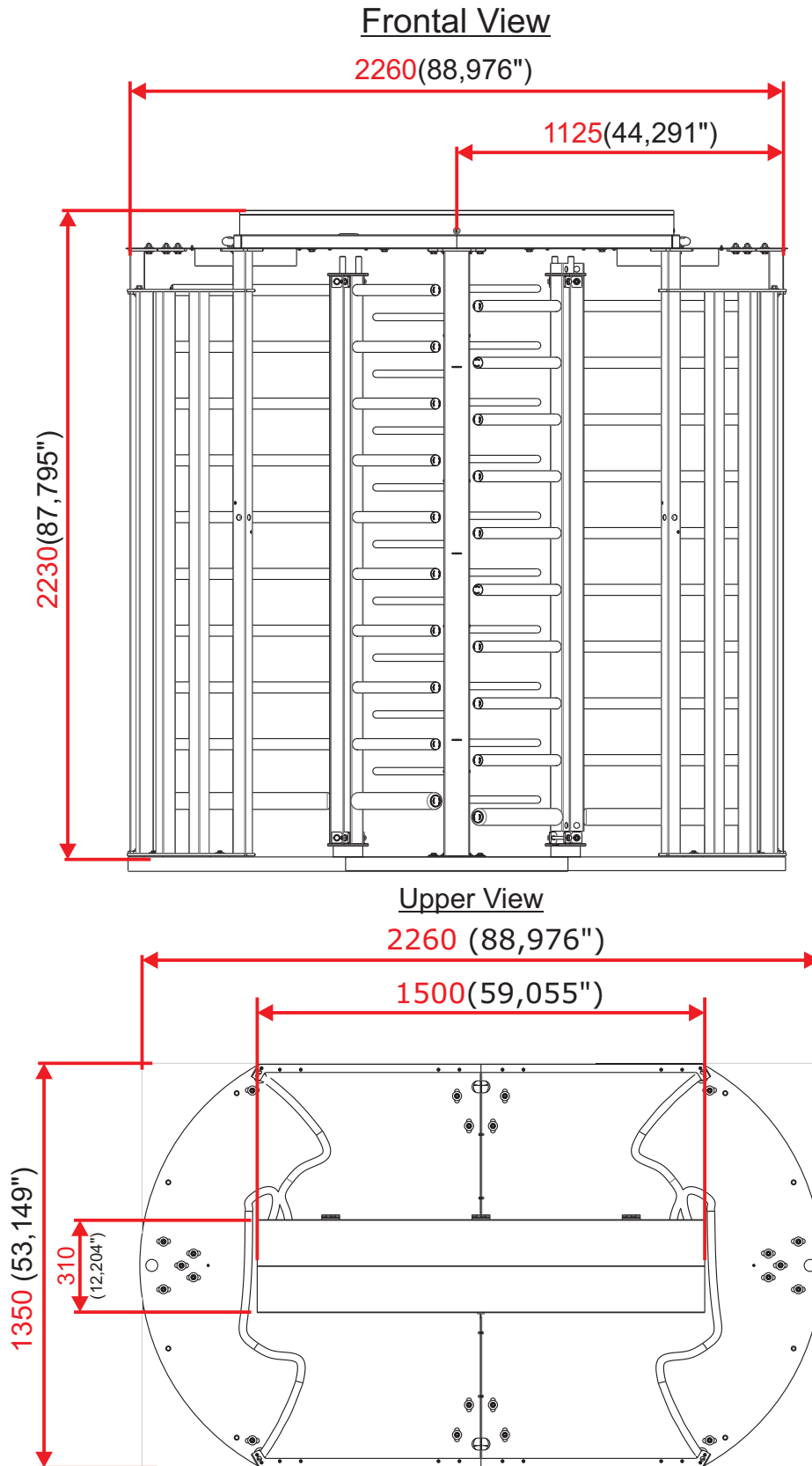
1. Open the grease fittings at the central arms' base and add grease. (We recommend the Molykote BR-2 Plus grease).



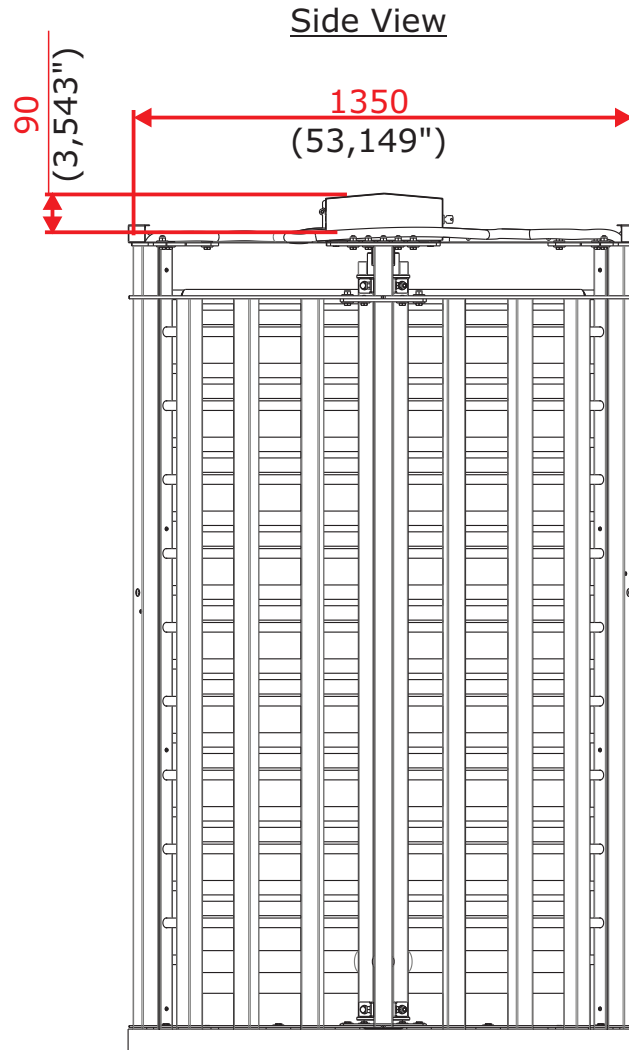
9.2 Defect, causes, and solutions

DEFECT	CAUSES	SOLUTIONS
<ul style="list-style-type: none"> It will not turn on 	<ul style="list-style-type: none"> The power supply's input cable is not connected properly The fuse of the power supply is blown 	<ul style="list-style-type: none"> Check the cables and the fuse (fuse: 3 A)
<ul style="list-style-type: none"> It is locked 	<ul style="list-style-type: none"> Optical sensors obstructed or defective 	<ul style="list-style-type: none"> Perform the preventive routine maintenance on the sensors or forward the equipment to the Technical Assistance
<ul style="list-style-type: none"> It does not activate the electromagnet (turnstile cannot be locked) 	<ul style="list-style-type: none"> The cable is broken or the distance between the electromagnet and the locking device is maladjusted 	<ul style="list-style-type: none"> Adjust the electromagnet or forward the equipment to the Technical Assistance
<ul style="list-style-type: none"> The arm does not remain in the correct position 	<ul style="list-style-type: none"> There is wear, dirt, a broken spring or lack of lubrication in the sphere base 	<ul style="list-style-type: none"> Request a replacement for the faulty part or forward the equipment to the Technical Assistance
<ul style="list-style-type: none"> It does not lock in the first tooth 	<ul style="list-style-type: none"> The distance between the electromagnet and the locking device is maladjusted 	<ul style="list-style-type: none"> Adjust the electromagnet or forward the equipment to the Technical Assistance.

9.3 Dimensions:



INFORMATION: Measures informed in this manual are given in millimeters and inches.



INFORMATION: *All measures presented in the images are in millimeters and inches.*

9.4 Other information

Gross weight	Approx. 590kg (including package)
Distance between arms	120 degrees
Electromagnets' power supply	12 V and 2 A
Sensors' power supply	5 V and 0.5 A
Package	2340mm X 1080mm X 700mm
Power supply	Input: 100 Vac to 240 Vac Output: 12,0 Vac 5% / 3 A Dimensions: 35 x 51 x 105 mm Distance between holes: 43 x 98 mm Hole diameter: 3,5 mm
Consumption	7W (stand-by) 20W (peak/forcing arm)

10. Warranty and technical assistance

Digicon is responsible for the project, skilled labor, and quality of the materials used in the manufacturing of our products, ensuring that the equipment and all parts are free of manufacturing defects or problems. Digicon commits itself to replace or repair, as we choose, any part or equipment presenting manufacturing defects without any costs to the buyer, in our factory in Gravataí or our branch office in São Paulo, in the conditions set below:

1. The buyer is responsible for the costs of shipping (return service) of the product to the factory in Gravataí or the branch office in São Paulo.
2. The warranty period is counted from the date of emission of the bill of sale and encompasses:
 - a) 12 (twelve) months for equipment, accessories, parts, and pieces, including the legal warranty period of 90 (ninety) days.

Legal warranty

The customer has the period of 90 (ninety) days, from the date of emission of the bill of sale, to complain about apparent defects (easily observable in the product), such as the items that constitute the product's exterior and any other area accessible to the user, just like appearance parts and general accessories.

- b) 90 (ninety) days for repairs or technical assistance

3. Warranty shall be granted to the buyer only in the face of the bill of sale (original or copy)

4. Warranty does not apply in the following cases or conditions:

- a) defects and damages caused by accidents, negligence, or reasons of force majeure
- b) defects and damages caused by inappropriate storage or lack of prolonged use
- c) defects and damages caused by improper use of the equipment
- d) defects and damages caused by improper operation or installation of the equipment
- e) vandalism
- f) natural impacts (lightning, flooding, etc.)
- g) defects and damages caused by abnormal temperature conditions, voltage/frequency, or humidity out of the levels specified in the installation and operation manual, once proven
- h) reconditioning, chrome plating, nickel plating, and painting

5. Warranty shall be automatically canceled for equipment that:

- a) suffers modifications, adaptations, or any alterations performed by the client or by third parties without Digicon's written consent
- b) goes through maintenance or repairs by people not authorized by Digicon
- c) suffers alteration of serial number or violation of the identification label
- d) is not paid for in the conditions, amounts, and deadlines described in the bill of sale

6. Digicon is not responsible for eventual losses suffered by the down time of the equipment

7. The repair of a warranted product will be performed inside the Digicon facilities.

digicon

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