

ASSEMBLY MANUAL

Full Height Turnstiles TX LITE

FHT

Version 1.0

Rio Grande do Sul

2005

INDEX

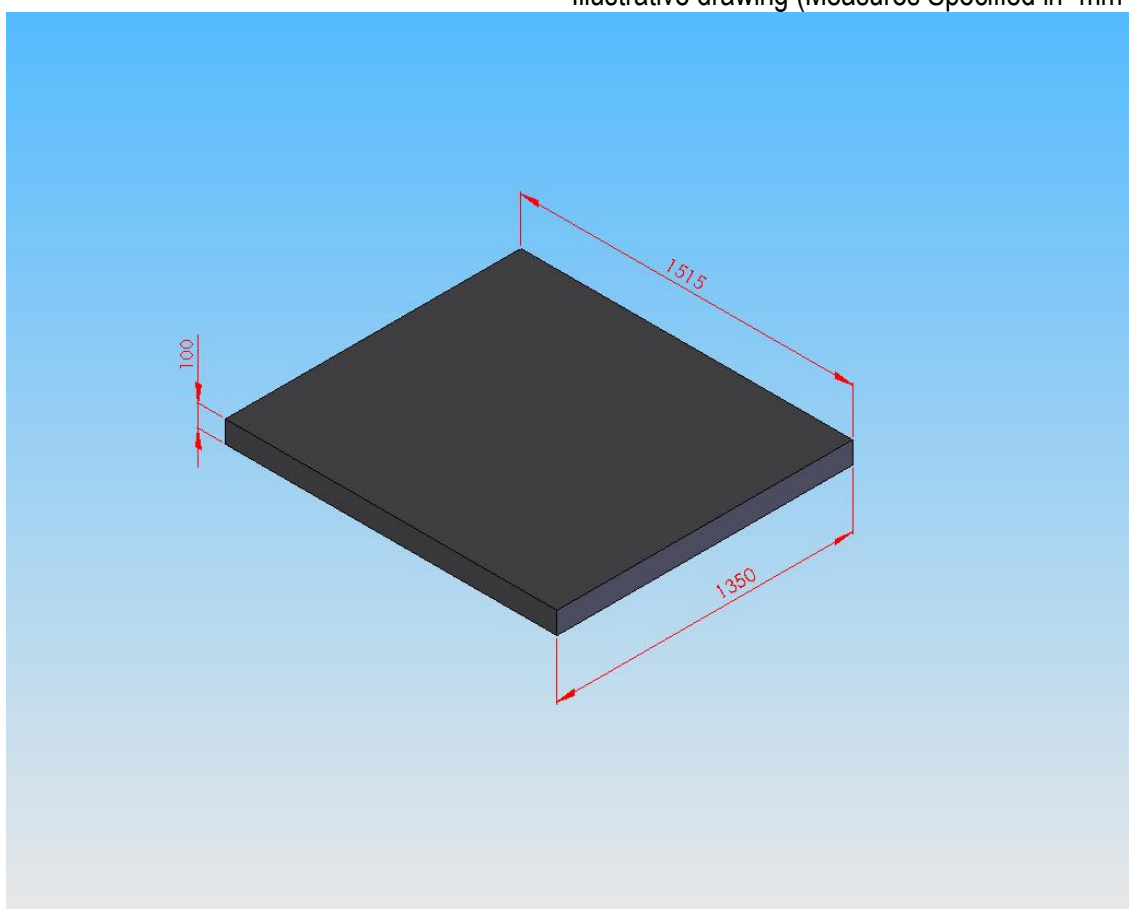
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1º Step: Ground Preparation.

The site chosen for the installation should have the following characteristics:

- Dimensions: 151,5cm x 135cm x 10cm
- Level the floor for better product performance.
- Floor Specification (FCK15 M.P.A. concrete or equivalent).

Illustrative drawing (Measures Specified in "mm")



Obs.: The concrete block dimension is a suggestion. The client can choose for smaller bases (brackets) in the fixation points (predefined by the gauge).

2º Step: Floor perforation device.

1º It will be necessary to put a “saco bolha” underneath the device to avoid scratches. (Pos. 2)

2º Screw the device on the Full Height Turnstile top cover. (Pos. 1)

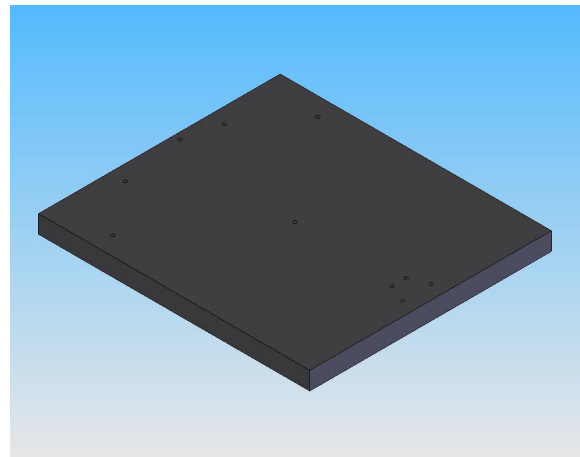
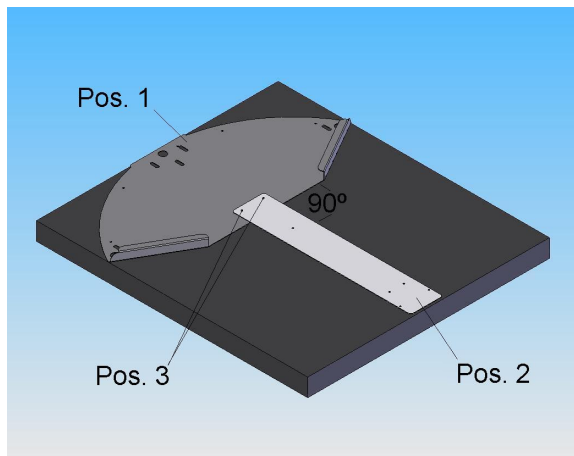
3º Positioned the device in the area chosen for installation.

4º Pay attention to the opening desired side of the central support for maintenance. Verify this info on the picture of the Full Height Turnstile mounted at the end of this manual.

5º The perforation device should be positioned at 90º in relation to the FHT roof and fix it (Pos.2) with the below related screw. (Pos. 3)

6º The daily pay-puncture have to be maid with a Ø6mm drill, in order to avoid damages on the device holes.

7º Reperforate all punctures with a Ø15mm drill.



Pos. 1 – FHT Roof (Obs.: Paint) 060.23.560

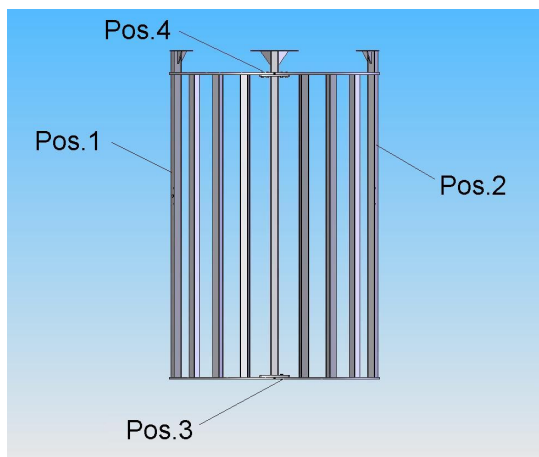
Pos. 2 – Device that goes with the product.

Components: (Pos. 3)

Screw: 025.28.004 Quant: 2

Nut: 029.004 Quant: 2

3° Step: Laterals Assembly.



1° Fit in the laterals in order to create an arc.

2° Screw the laterals.

Components:

Pos. 1 – FHT Lateral 5 Rods

070.11.107 Quant: 1

Pos. 2 - FHT Lateral 4 Rods

070.11.108 Quant: 1

Pos. 3 - Screw: 025.28.012 Quant: 1

Pos. 3 – Flat Washer: 030.31.001 Quant: 1

Pos. 4 - Screw: 025.28.002 Quant: 4

Pos. 4 - Flat Washer: 030.31.007 Quant: 4

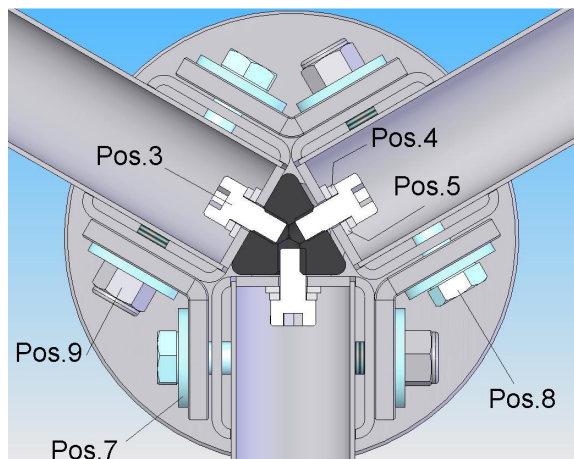
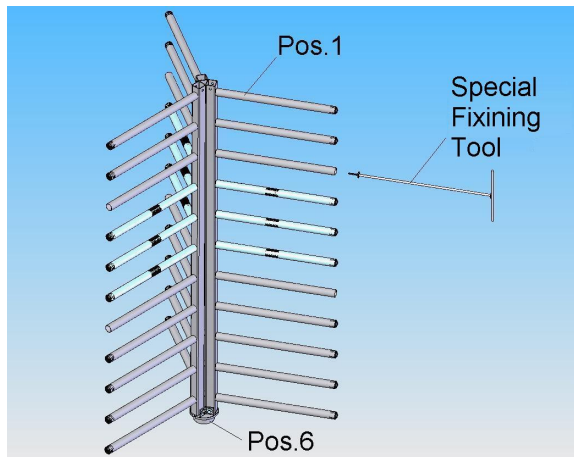
4° Step: Special tools for assembly.

The FHT central arm assembly needs a special tool (070.11.137 Central arms fixing tool) for fixing the arms. (Delivered along with the product)

Illustrative drawing



5° Step: Central arms assembly



Arms internal assembly picture.

1° Fix the 3 arms using the internal fixer.

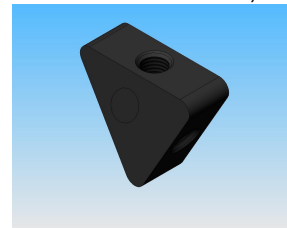
2° Fix the arms internally by screwing on the screws positioned inside the arms without the black drain plugs. Use the special fixing tool (070.11.137).

3° Fix the central column base Pos. 6.

4° Insert the drain plugs.

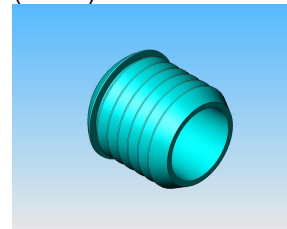
Components:

Pos.1 - 070.11.136;	Quant: 3
Pos.2 - 060.84.004;	Quant: 2
Pos.3 - 024.056;	Quant: 6
Pos.4 - 030.30.001;	Quant: 6
Pos.5 - 031.005;	Quant: 6
Pos.6 - 070.10.987;	Quant: 1
Pos.7 - 060.81.001;	Quant: 6
Pos.8 - 025.28.018;	Quant: 3
Pos.9 - 029.01.022;	Quant: 3
Pos.10 - 060.23.028;	Quant: 6



Internal Fixer

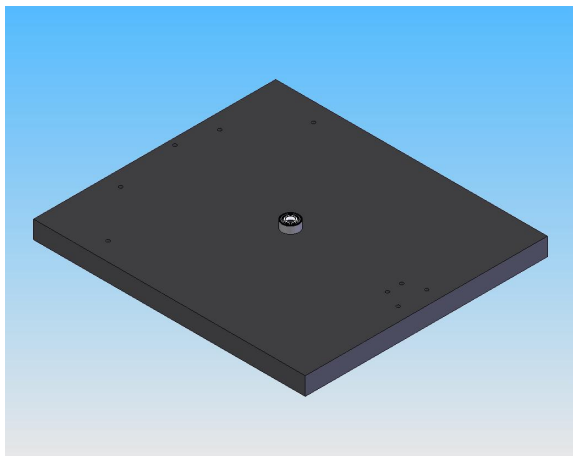
(Pos.2)



Drain Plug

(Pos. 10)

6° Step: Central roller bearing setting



1° Substitute the anchor bolt washer for the washer "060.81.001".

2° Use anchor bolt specification (anchor bolt with Screw C38312 3,1-2 3-8). It does not accompanies the product.

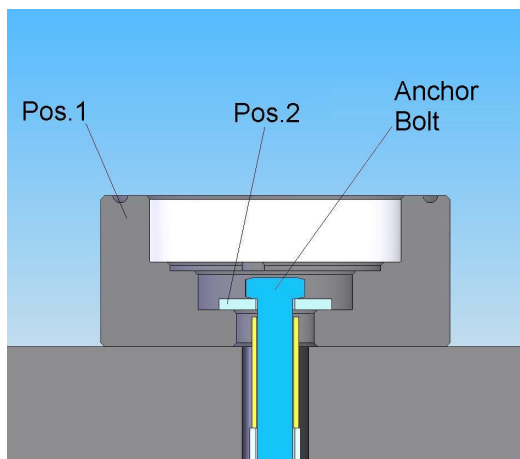
3° Fix the roller bearing in the central hole as shown in the figure.

Components:

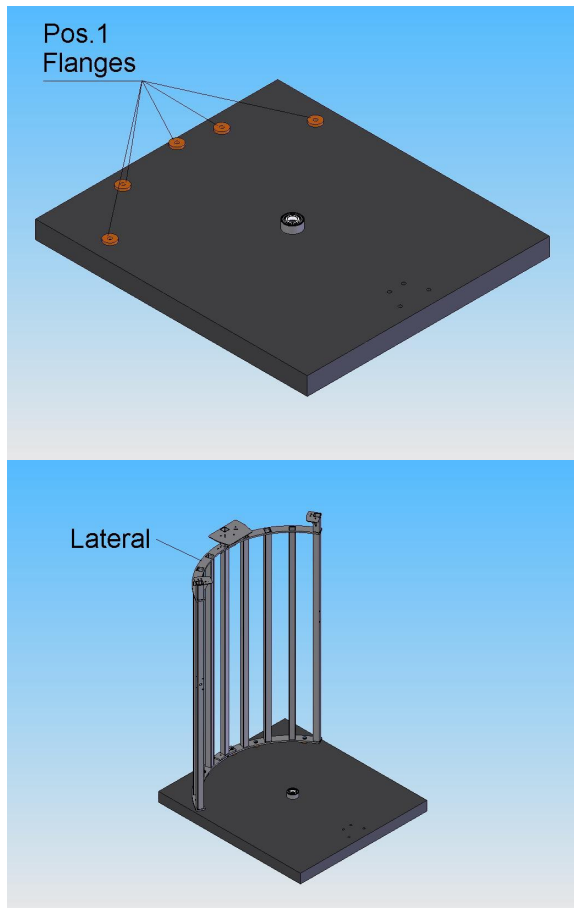
Pos.1 - 070.10.993; Quant: 1

Pos.2 - 060.81.001; Quant: 1

anchor bolt. Quant. 1



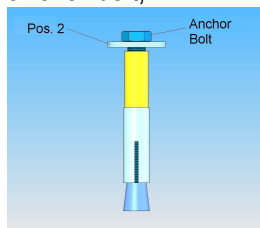
7° Step: Laterals setting



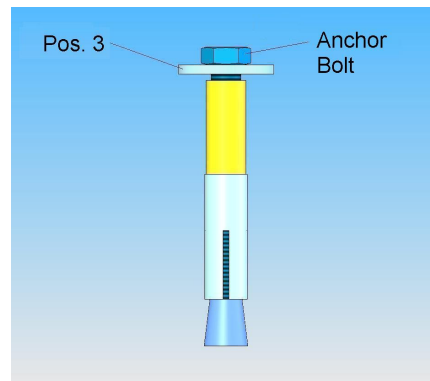
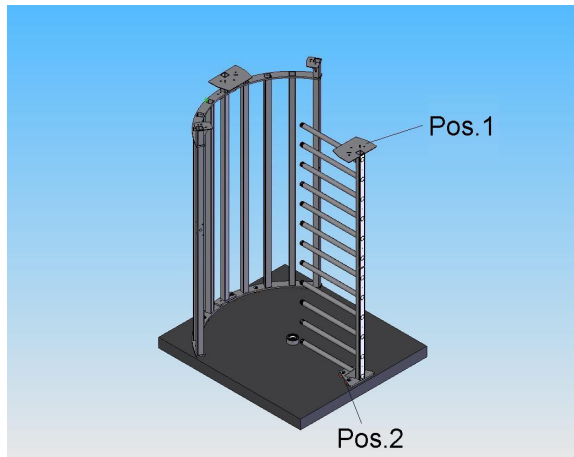
- 1° Place the flanges coincidently to the holes on the ground.
- 2° Put the power supply cable inside one of the pipes (central one or any one on the sides).
- 3° Align the laterals over the, coincident flanges to the holes.
- 4° Put the "060.81.001" washers on the anchor bolts.
- 5° Put the anchor bolt for final setting fixation.
- 6° Screw on all screws.

Components:

Pos.1 - 060.73.099;	Quant: 5
Pos.2 - 060.81.001;	Quant: 5
anchor bolt;	Quant: 5



8° Step: Fixed arm setting

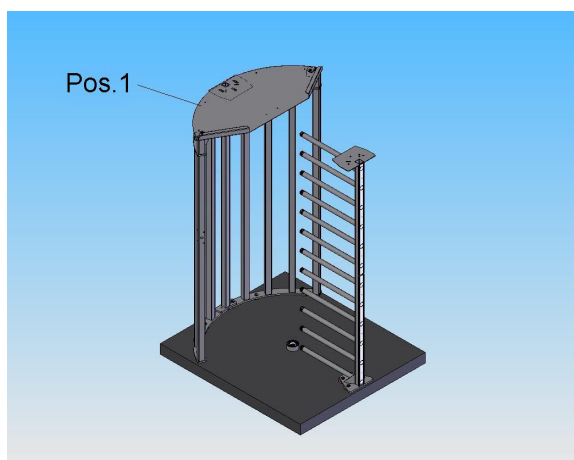


- 1° Put the flanges coincidently to the holes on the floor.
- 2° Put the fixed arm on the flanges and the coincident holes on the floor.
- 3° Put the "060.81.001" washer in the anchor bolt.
- 4° Put the anchor bolt for setting.
- 5° Screw on all screws.

Components:

Pos.1 - 070.11.114; Quant: 1
 Pos.2 - 060.73.099; Quant: 4
 Pos.3 - 060.81.001; Quant: 4
 anchor bolt; Quant: 4

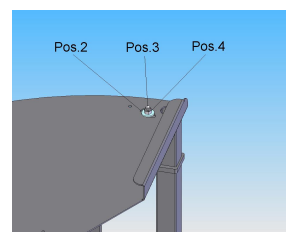
9° Step: Sealing setting.



Pos.3 - 025.28.012; Quant: 2
 Pos.4 - 029.01.022; Quant: 2

- 1° Put the sealing over the laterals (Pos. 1).

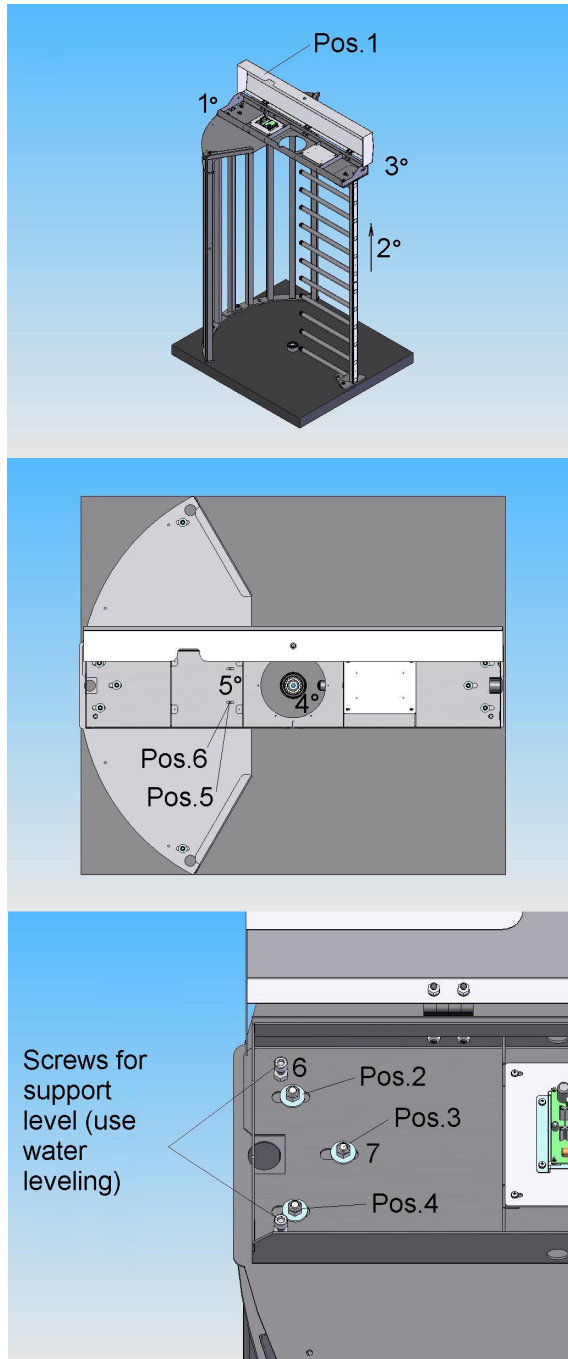
- 2° Screw on only the sealing sides as figure below:



Components:

Pos.1 - 060.23.560; Quant: 1
 Pos.2 - 060.81.001; Quant: 4

10° Step: Coverture alignment and setting.



1° Put the central support on the top of the ceiling and fixed arm (Pos. 1).

2° Put the screw from the lower side to the upper side with washers in both sides.

3° Put the nuts with poliamid with out screwing on completely.

4° Align the central circuit along with the roller base.

5° Put the sealing fixing screw with the support.

6° Level the central support, regulating by screwing on the four support extremities.

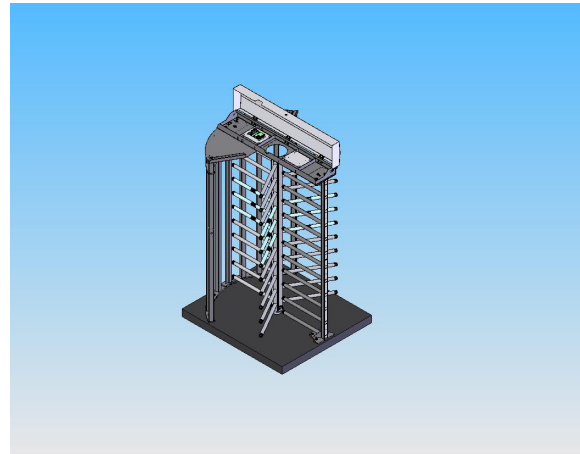
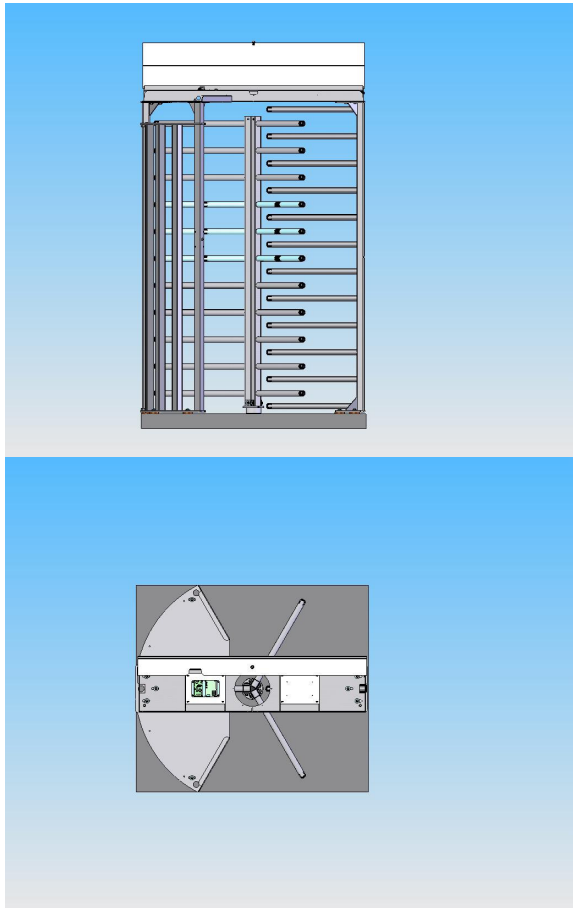
7° Finish screwing on the central support setting nuts.

Components:

Pos.1 - 080.01.561;	Quant: 1
Pos.2 - 060.81.001;	Quant: 12
Pos.3 - 025.28.012;	Quant: 6
Pos.4 - 029.01.022;	Quant: 6
Pos.5 - 025.28.004;	Quant: 2
Pos.6 - 029.004;	Quant: 2

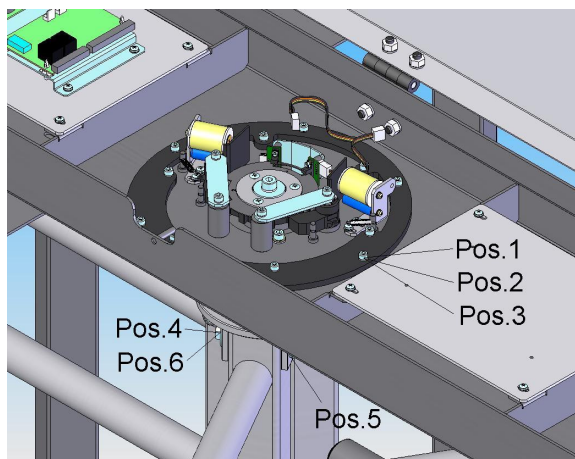
Obs: It is important that the central support is well leveled (Pos. 1). Eventhough the FHT has devices to compensate any assembly mistake this does not warranty a good functioning of the product and the arm turning can get a little heavy.

11° Step: Fitting the central arm



- 1° Spread some grease on the roller base.
(We recommend Grease Molykote BR-2 Plus)
- 2° Fit the arm base on the roller base.
- 3° One of the arm structure has to be aligned with the fixed arms as shown in figure beside.

12° Step: Fitting in the central top cover.



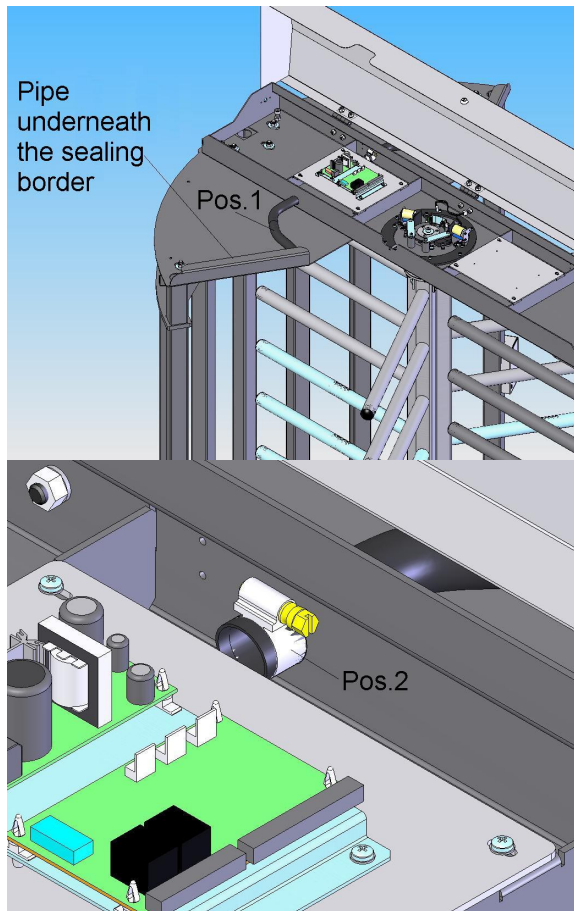
- 1° Fit in the superior base of the central arms along with the central arm. Attention to the flange that will have to meet with the support holes in such a way that one of the central arm is leveled and opposite to the fixed arm.

- 2° Fix superior base on the central arms.

Components:

Pos.1 - 030.31.008;	Quant: 6
Pos.2 - 030.30.009;	Quant: 6
Pos.3 - 025.24.053;	Quant: 6
Pos.4 - 060.81.001;	Quant: 6
Pos.5 - 025.28.018;	Quant: 3
Pos.6 - 029.01.022;	Quant: 3

13° Step: Fitting in pipes for cables.



1° Insert cables and wires across the pipe.

2° Place one of the pipes tip inside the central support and the other tip inside the metalon.

3° Place the pipe underneath the sealing border as shown in figure 1.

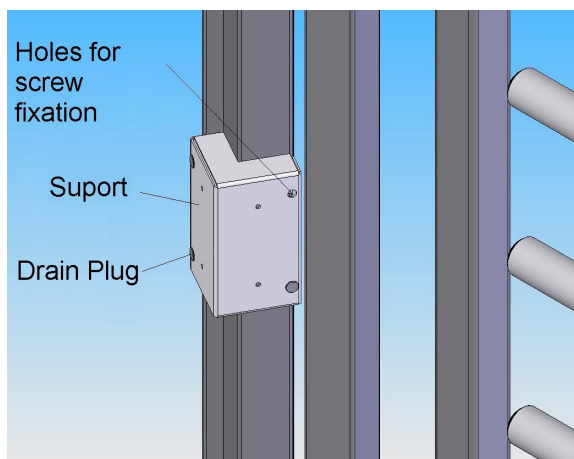
4° Inside the support, put one clamp on the pipe tip to avoid the same to be pulled out.

Components:

Pos.1 - 020.81.011; Quant: 2x1m

Pos.2 - 020.01.080; Quant: 2

14° Step: Card reader support assembly.



1° Place the card reader support on the FHT in such a way that its holes meet with the holes on the FHT arm.

2° Screw on the supports on both FHT entrance/exit sides.

3° Put the drain plugs on the card reader support holes.

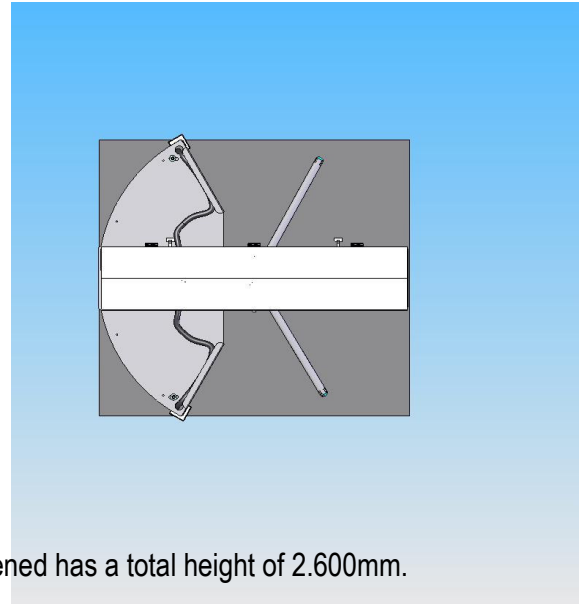
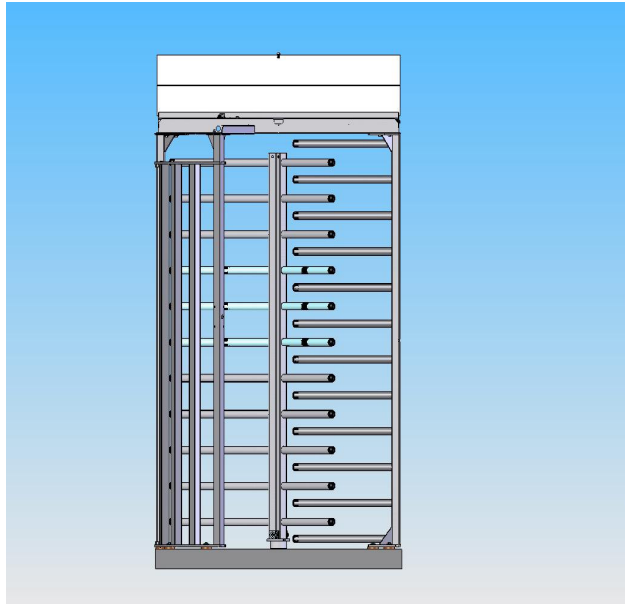
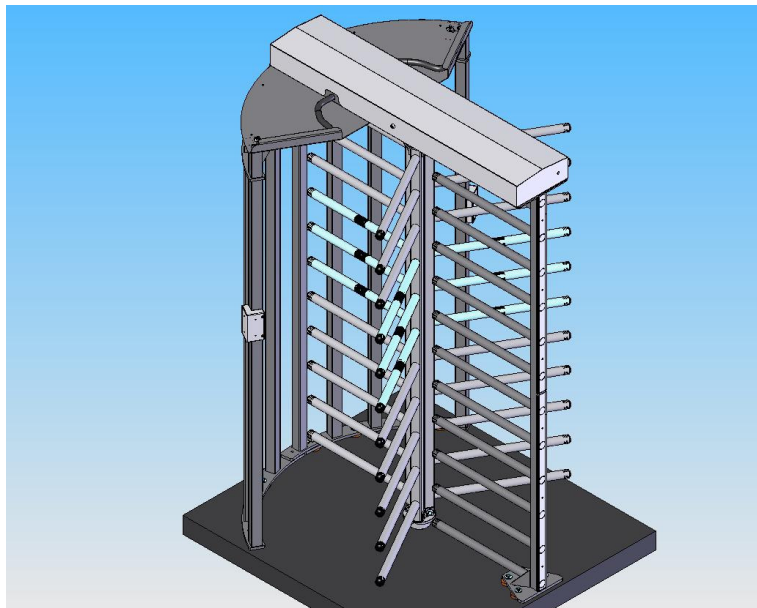
Components:

Pos. 2 - 060.10.953; Quant: 2

Pos. 1 - 024.041; Quant: 8

Pos. 3 - 060.23.379; Quant: 8

Full Height Turnstile Fully Mounted

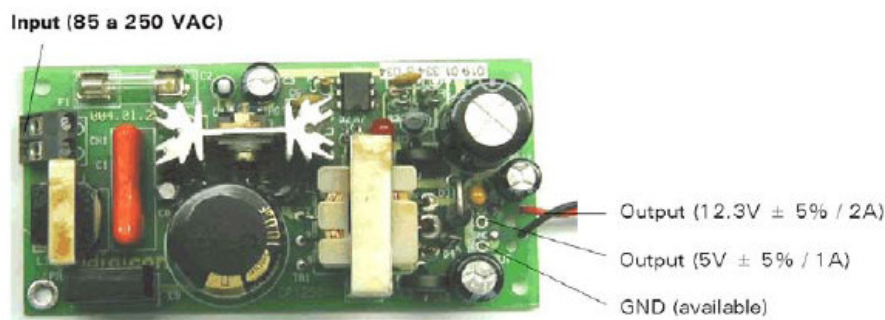


er opened has a total height of 2.600mm.

16 - POWER SUPPLY:

This power supply unit was especially designed for the CATRAX line. One of the main advantages of this optional item is its input voltage range – between 85 and 250 VAC – and therefore its capability to adapt to the voltage variations common in many installation sites.

This reliable power supply unit was carefully tested and developed to work under the most hostile environmental and temperature conditions. The power supply unit is also protected against short circuits and overheating.



17 - CONTROL BOARD:

The CATRAX Master control board was designed to meet the needs of most current access control technologies. Its mechanical characteristics and layout are perfectly suited to the needs of the CATRAX Master, making it one of the best options for operating the equipment.

The following figures show the control board, straps, connectors and dip-switches, as well as the location of both the power supply and control board in the CATRAX Master.

The table below describes the functions of controller board connectors.

Signal	Name/Description
CN1	INPUTS
1	+Vext1 (enable turn by voltage)
2	HAB1 (enable turn by direct contact – right to left)
3	GND
4	Vext2 (enable turn by voltage)
5	HAB2 (enable turn by direct contact – left to right)
6	GND
7	+12 VDC (available for auxiliary – maximum of 500 mA)
8	CLOCK1 (input for reader left to right)
9	DATA1 (input for reader left to right)
10	CLOCK2 (input for reader right to left)
11	DATA2 (input for reader right to left)
12	GND
13	PROG1 (program direction)
14	PROG2 (program direction)
15	PIC1 (control front pictogram 1)
16	PIC2 (control front pictogram 2)

CN2	OUTPUTS
1	N.O. or N.C. contact (HAB1 return)
2	C contact (HAB1 return)
3	N.O. or N.C. contact (HAB2 return)
4	C contact (HAB2 return)
5	Output for X (NPN open collector – maximum of 500 mA) – orange wire
6	Output for → (NPN open collector – maximum of 500 mA) – blue wire
7	Output for ← (NPN open collector – maximum of 500 mA) – green wire
8	+12VDC (power for indicator arrows) – red wire
9	GND (power for indicator arrows) – black wire
10	+ badge collector box solenoid
11	- badge collector box solenoid
12	Audible signal (open collector - NPN)
CN3	UPPER PICTOGRAM
1	+12 VDC (power for indicator arrows) – as for CN2[8]
2	Output for X (NPN open collector – maximum of 500 mA) – as for CN2[5]
3	Output for → (NPN open collector – maximum of 500 mA) – as for CN2[6]
4	Output for ← (NPN open collector – maximum of 500 mA) – as for CN2[7]
5	GND (power for indicator arrows) – as for CN2[9]
CN4	SIDE PICTOGRAM 2
1	+12 VDC (power for indicator arrows)
2	Output for X (NPN open collector – maximum of 500 mA)
3	Output for → (NPN open collector – maximum of 500 mA)
4	GND (power for indicator arrows)
CN5	SIDE PICTOGRAM 1
1	+12 VDC (power for indicator arrows)
2	Output for X (NPN open collector – maximum of 500 mA)
3	Output for → (NPN open collector – maximum of 500 mA)
4	GND (power for indicator arrows)
CN6	INPUTS/OUTPUTS
1	Input or output 1 - configure at S4 (IN or OUT)
2	Input or output 2 - configure at S5 (IN or OUT)
3	Input or output 3 - configure at S6 (IN or OUT)
4	Input or output 4 - configure at S7 (IN or OUT)
Signal	Name/Description
CN7	SERIAL RS-232
2	TX
3	RX
5	GND
CN8	POWER – POWER INPUT
1	+12 VDC Power input
2	GND Power input
CN9	CARD STORAGE 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 signal 1
2	LED1 anode
3	Sensor signal 2
4	GND
5	LED2 anode

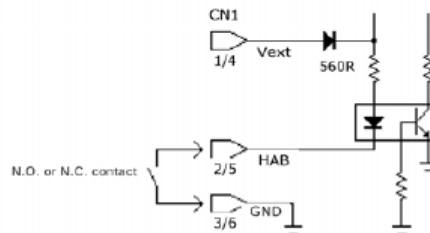
The CATRAX Master can be configured as follows to determine direction of movement, using pins 13 and 14 of the CN1 connector:

Direction of movement	PROG1 (pin 13)	PROG2 (pin 14)
Free in both directions	Open	Open
Blocked left to right only	GND	Open
Blocked right to left only	Open	GND
Blocked in both directions	GND	GND

17.1 - INPUTS

The inputs or turn-enabling signals (HAB1 and HAB2) can be triggered by relay, pushbutton contact, or 5 to 24 VAC/DC or 110 to 220 VAC/DC pulses.

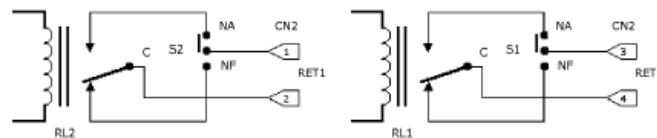
In order to enable turn through relay or pushbutton contact, make the connection as shown in the figure below:



17.2 - OUTPUTS

The CATRAX Master board has outputs for return signals, electromagnets, pictogram indicators, card collection box, and audible alarm.

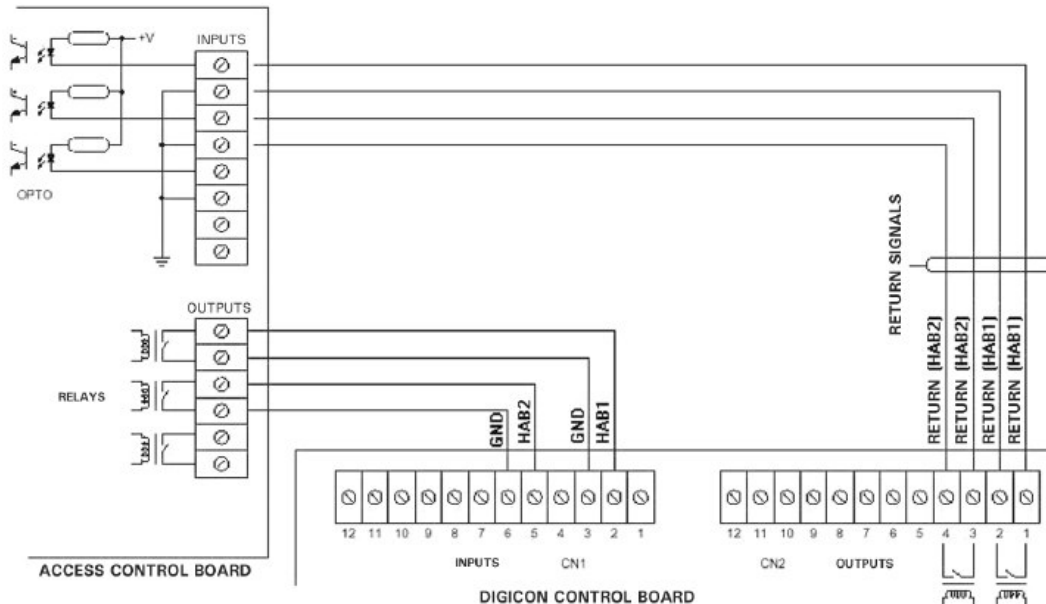
The return signals indicate the moment and the direction of turn and are generated at a relay (normally open, N.O., or normally closed, N.C. contact). Connect the outputs as in the figure below:



17.3 - ELECTROMAGNETS

The electromagnets are activated to block the turnstile. Unlike traditional solenoids, electromagnets cause no friction between the spring and the locking device, thus preventing malfunction. Moreover, they are activated by a transistor rather than by a relay, which prevents burning due to stuck contacts (no mechanical wear).

17.4 - CONNECTION DIAGRAMS



17.5 - DIP SWITCH CONFIGURATION:

Dip-switch DS1 is used to configure the following:

- direction of movement;
- maximum time of passage;
- N.O. inputs (normally open relay or pushbutton pendant switch contacts without input voltage) to enable turn in the presence of these signals, or N.C. inputs (normally closed relay or pushbutton pendant switch contacts with input voltage) to enable turn in the absence of these signals;
- audible alarm signal if the turnstile stops in mid turn for over five seconds.

To program the DS1, place the pins in the positions indicated in the table below.

	01	02	03	04	05	06	07	08
Free in both directions	-	-	-	OFF	OFF	-	-	-
Blocked left to right only	-	-	-	ON	OFF	-	-	-
Blocked right to left only	-	-	-	OFF	ON	-	-	-
Blocked in both directions	-	-	-	ON	ON	-	-	-
N.O. inputs	-	ON	-	-	-	-	-	-
N.C. inputs	-	OFF	-	-	-	-	-	-
Enable audible signal	ON	-	-	-	-	-	-	-
Disable audible signal	OFF	-	-	-	-	-	-	-
Enable audible signal in mid turn	-	-	-	-	-	ON	-	-
Disable audible signal in mid turn	-	-	-	-	-	OFF	-	-
Wait until first turn	-	-	-	-	-	-	ON	ON
Wait 5 seconds	-	-	-	-	-	-	OFF	ON
Wait 10 seconds	-	-	-	-	-	-	ON	OFF
Wait 15 seconds	-	-	-	-	-	-	OFF	OFF
Enable by terminal*	-	-	OFF	-	-	-	-	-
Enable by level**	-	-	ON	-	-	-	-	-

* "Enable by terminal" means that the CATRAX Master will be enabled by a pulse at the entry terminal (N.C. inputs) or exit terminal (N.O. inputs).

** "Enable by level" means that the CATRAX Master will remain free as long as there is an input signal.

17.6 - SAMPLE CONFIGURATIONS

1 – To receive relay pulse (N.O. contact), release turn, and wait 10 seconds for turn:

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

2 – To always allow turn from left to right and to release turn from right to left for an indefinite period on receiving an HAB2 signal:

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

3 – To unlock turnstile when the relay contact is closed and to lock arms as soon as the contact is opened:

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

17.7 - SERIAL CONFIGURATION

The CATRAX Master control board allows serial configuration of the equipment. The communication protocol used is as follows:

STX	Size(LSB)	Size(MSB)	Commands	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 **Comandos**.

NOTES

- **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 the CATRAX Master:

HEX	ASCII	FUNCTION
0x48	H	Turnstile free right to left
0x41	A	Turnstile free left to right
0x44	D	Turnstile free in both directions
0x43	C	Return to control (command used to exit free state)
0x4C	L	Turnstile free (include direction of free motion: <0x4C> + <0x48>)
0x53	S	Direction programming (include direction to be programmed: <0x53> + <0x48>)

The following table shows the return commands sent by the equipment:

HEX	ASCII	FUNCTION
0x48	H	Turnstile free right to left
0x06	▲	ACK, indicates OK command
0x15	§	NACK, indicates invalid command
0x1A	→	Right to left direction return command (RET1)
0x1B	←	Left to right direction return command (RET2)

Some sample commands are as follows:

Free left to right turn (1 passage):

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

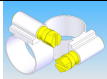
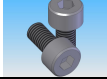
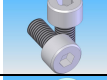
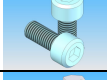
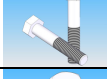
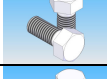
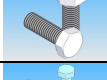
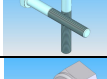
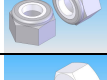
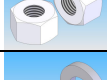
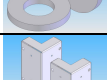
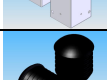
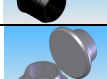
Configure left to right turn always free:

0x02	0x03	0x00	0x4C	0x48	0x05
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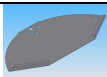
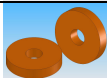
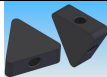
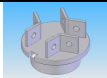
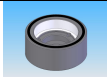
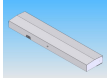
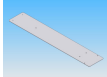
Return OK command:

0x02	0x02	0x00	0x06	0x06
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18 – CHECK LIST

Picture	Code	Description	Quant.	Verf. Digicon	Verf. Client
	020.089	Abraçad. P/D=19-27mm L=14,5	2		
	020.81.011	¾" Flexible Pipe	2x1m		
	024.041	Allen Screw C.C. CIL M4x8 OX PT	8		
	024.056	Allen Screw C.C. CIL M8x16	6		
	025.24.053	Allen Screw C.C. CIL M5x12 Aço Inox	6		
	025.28.002	Hexagonal Screw M8x45	4		
	025.28.004	Hexagonal Screw M5x12	2		
	025.28.012	Hexagonal Screw M10x30	9		
	025.28.018	Hexagonal Screw M10x80 Aço Inox	6		
	029.01.022	Porca Sext. M10 c/ Bucha Poliamida	14		
	029.004	Hexagonal nut. M5 Aço Carbono Bicr.	2		
	030.30.001	Pressure washer D=8mm	6		
	030.30.009	Pressure washer D=5mm Aço Inox	6		
	030.31.001	Flat washer D=10mm Aço Inox	1		
	030.31.008	Flat washer D=5mm Aço Inox	6		
	031.005	Flat washer D=8mm	6		
	060.10.953	Card reader support	2		
	060.23.028	Finish drain plug	6		
	060.23.379	Structure Drain Plup	8		

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	060.23.560	FHT sealing	1		
	060.73.099	FHT inferior flange	9		
	060.81.001	Washer D=30,5x10,5xE=3mm	38		
	060.84.004	Internal fixer	2		
	070.10.987	Central column base set	1		
	080.01.493	Central Mechanism	1		
	070.10.993	Inferior bearing set	1		
	070.11.107	FHT 5 laterals rod set	1		
	070.11.108	FHT 4 laterals rod set	1		
	070.11.114	FHT fixed arm set	1		
	080.01.561	Assembled top cover	1		
	070.11.136	Central column arm	3		
	070.11.137	Central arms fixing tool	1		
	060.95.001	Drilling device	1		