

digicon

PRODUCT MANUAL

catrax
fit



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The CATRAX Fit features two operating mechanisms. The basic model (with no control board) employs a bidirectional rotation system with two 12 V electromagnets that activate the locks and two optical sensors that provide the electromagnets with information on turn completion and direction of turn.

Depending on the turnstile's configuration and model, forcing the arm in the absence of an "enable turn" signal will activate an electromagnet that locks the arm. In this case, the equipment may also emit an audible alarm and/or display (see separate manual) a red X on the upper panel display (models with pictogram indicators). A return signal will then be sent, indicating that the turnstile was forced and informing the direction of turn.

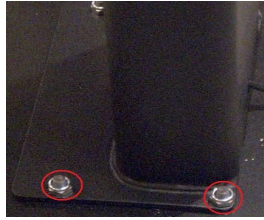
1.1 PREPARING THE INSTALLATION SITE

1. The site chosen for installation is adequate – keep in mind that the turnstile must be installed indoors.

- ## 1.2 INSTALLING THE COLUMN

-
- Technical drawing of the top view of a rectangular floor plate. The overall dimensions are 250 mm in width and 165 mm in height. The width is divided into a 105 mm section on the left and a 40 mm section on the right. The height is divided into a 35 mm section on the left and a 130 mm section on the right (30 mm + 100 mm). There are four circular floor holes, each with a diameter of $\varnothing 12,5 (4X)$, located at the corners. A central rectangular area is defined by a dashed line, with a blue dot indicating the 'CABLE EXIT' location. The drawing includes various internal dimensions and offsets for the floor holes and the central area.

Dimensions in mm.



NOTE

Electrical and communication cables must pass through the cable exit. Check cut-out dimensions to make sure all cables will fit.

2. Clean the holes, removing drilling residues.
3. Place the four anchor bolts in the holes, leaving approximately 25 mm of the anchor bolt out of the hole.

NOTE

Recommended bolts: Tecmart AF38110, 3/8x4".

4. Position the column and fasten it onto the floor with the four bolts that come with the anchor bolts. Use a 3/4" socket wrench or spanner.

1.3 MOUNTING OF ARMS

After installing the column, you may proceed with mounting the. The instructions for assembly appear in the figure below.



NOTE

Use a #5 Allen wrench to mount the CATRAX Fit.

2 INSTALLATION / ASSEMBLY OF OPTIONAL PRODUCTS

2.1 PICTOGRAM KIT

The pictogram kit provides visual indication of the direction of turn (green arrows) and turn locking (red X). The pictograms are created using high-intensity LEDs.



For information on assembling the pictogram kit and on the items that come with the kit see the figure referring to the rear cover on page 4.

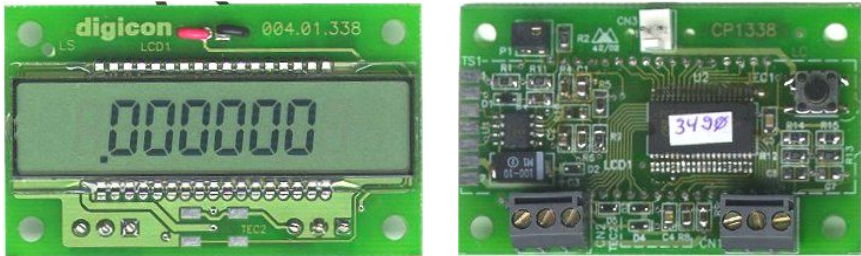
2.2 ELECTRONIC COUNTING KIT

The electronic pulse or rotation counting kit is digital, has six digits and has been developed for access control applications that employ Catrax Fit and Catrax Master turnstiles, and can also

be employed in other projects that require this type of device. The counter is located in the same place (side slot) as the mechanical counter.

The electronic counter offers two sensor inputs allowing it to be configured for sequential sensing, making it possible to detect turnstile rotations in a given direction. The device is also capable of counting single pulses (in common with other counters available on the market).

The Digicon electronic counter is operated by means of a single button that gives access to all of its functions. Optionally, an additional, key-operated button can be installed on the front panel.



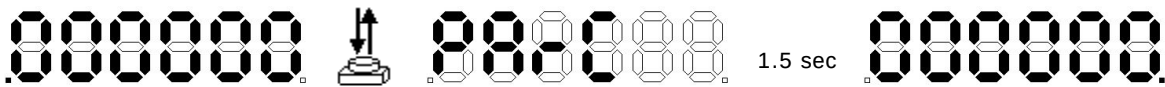
Available connections to the counter's circuit board are shown below.

Signal	Name/Description
CN1	
1	Ground
2	Sensor 1 input
3	Sensor 2 input
CN2	
1	External 5V power supply (battery eliminator)
2	Ground
3	Input for key switch to activate front panel button
CN3	
1	Ground
2	3V battery power supply (two 1.5V AA batteries)

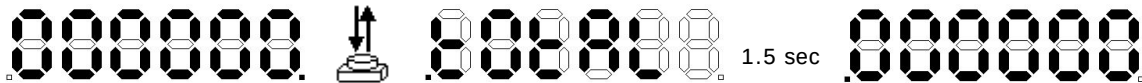
The device also offers two independent incremental count readouts, one of which indicates total count and the other partial count; only the second of these can be reset to zero during normal operation.

Pressing the control button for a short period switches the counting kit display between total and partial readouts. The readout being displayed is indicated by totAL or PARc on the screen and also by a dot in the bottom right corner for the partial readout and in the bottom left corner for the total.

View of the partial counter:

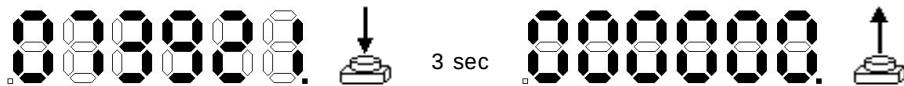


View of the total counter:



Resetting the partial readout to zero:

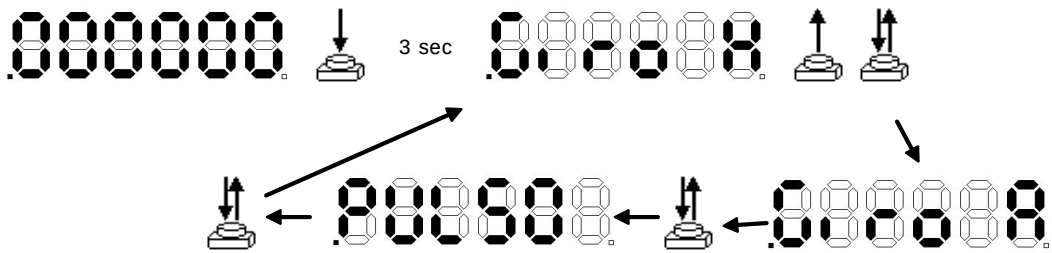
In order to reset the partial counter, the display must be in partial mode. Press and hold the function button for approximately 3 seconds (or until all digits display zero).



Configuration of operating mode:

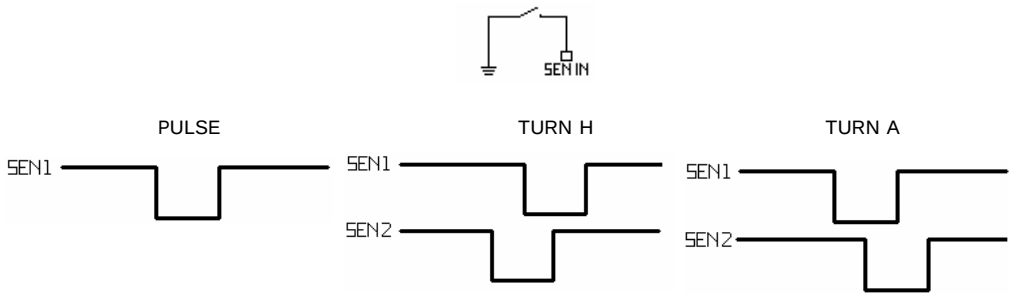
The counter can be configured to count pulses on clockwise or counterclockwise rotations ("clockwise" and "counterclockwise" are used merely for the purpose of differentiating between

the two rotation directions). The counter display must be in total mode for configuration. The procedure is shown below.



Sensors:

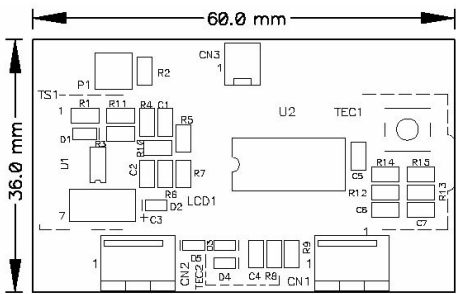
The sensors should short the sensor input to the counter's ground (keys, optical sensors, buttons, relays, etc.).



Power supply specifications:

Power supply	2 AA batteries (3V) 5V (battery eliminator)
Battery life	1.5 years or more than 3,000,000 cycles (alkaline batteries, with sensors and buttons open)
Number of digits	6
Data retention period	1 min 30 sec (to allow batteries to be changed without losing count)
Size of display digits	8 x 4 mm (height x width)

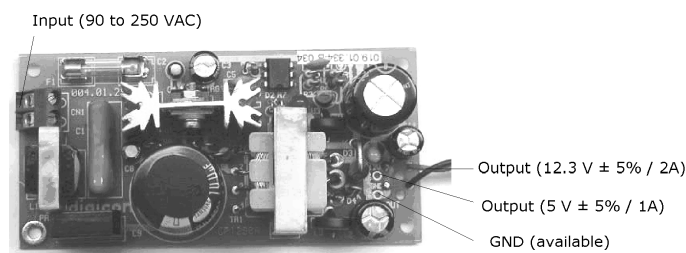
External dimensions:



2.3 POWER SUPPLY

This power supply unit was especially projected for the CATRAX Fit. One of the main advantages of this optional item is its input voltage range – between 90 and 250 VAC – and therefore its capability to adapt to the voltage variations that are 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.



NOTE

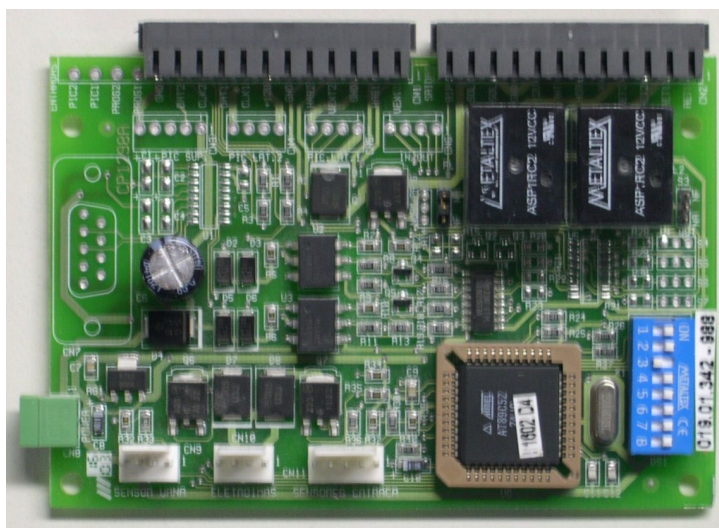
The power supply unit can be fastened to the mounting rack provided with the CATRAX Fit.

CAUTION

The power supply unit does not have a dedicated ground connection. Use the mounting rack fastening screw on the turnstile body for grounding.

2.4 CONTROL BOARD

The CATRAX Fit control board was designed to meet the needs of most of the current access control technologies.



The table below describes the functions of controller board connectors.

Signal	Name/Description
CN1	INPUTS
1	+Vext1 (enable turn by tension)
2	HAB1 (right to left direction)
3	GND
4	Vext2 (to enable turn by tension)
5	HAB2 (left to right direction)
6	GND
7	+12VDC (available for auxiliary – maximum of 500 mA)
8	CLOCK1 (input for reader – left to right direction)
9	DATA1 (input for reader – left to right direction)
10	CLOCK2 (input for reader – right to left direction)
11	DATA2 (input for reader – right to left direction)
12	GND
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

Signal	Name /Description
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	POWER – Power input
1	+12VDC power input
2	GND power input
3	GND
CN4	CARD CHUTE SENSOR
1	LED anode
2	Box signal
3	GND
4	GND
CN5	ELECTROMAGNETS
1	+ electromagnet 1
2	- electromagnet 1
3	+ electromagnet 2
4	- electromagnet 2
CN6	OPTICAL SENSORS
1	Sensor signal 1
2	LED1 anode
3	Sensor signal 2
4	GND
5	LED2 anode

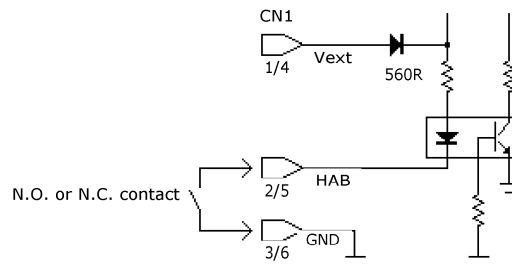
NOTES

- Optical sensor (CN6) and electromagnet (CN5) cables are supplied with the CATRAX Fit.
- The card chute sensor cable (CN4) is supplied with the card collection kit (ordered separately).

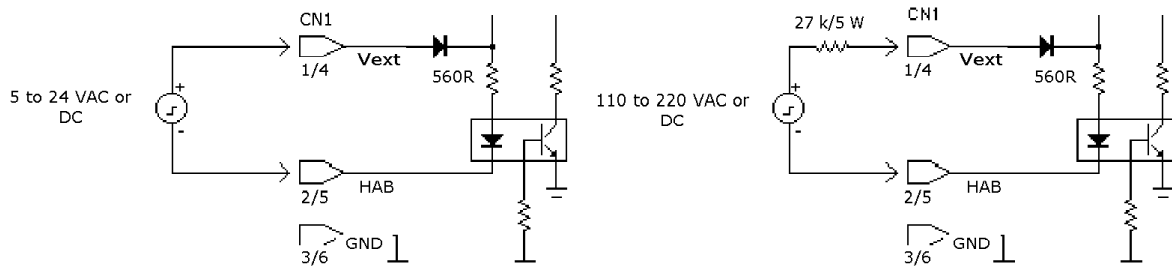
2.4.1 Inputs

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

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



Turn-enabling through tension pulse is shown in the following figure. DC polarity must be observed. For high voltages, use an external resistor (110 to 220 V).



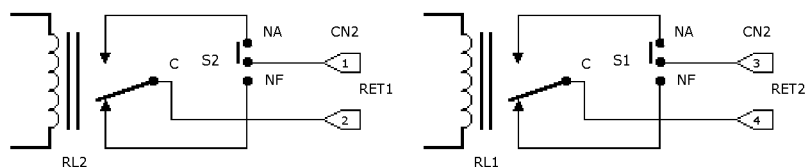
The control board also has inputs for optical sensors (CN6) that monitor turn without mechanical wear, and two optoisolated inputs to release the CATRAX Fit if required.

2.4.2 Outputs

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

2.4.2.1 Return signals

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



2.4.2.2 Electromagnets

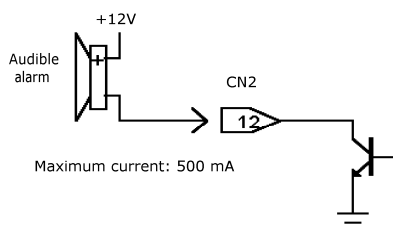
The electromagnets are activated for blocking the turnstile. Unlike traditional solenoids, electromagnets do not cause friction between the spring and the locking device, preventing malfunction. Moreover, they are activated by a transistor rather than by a relay, which prevents burning due to “contacts sticking together” (no mechanical wear).

2.4.2.3 Audible alarm

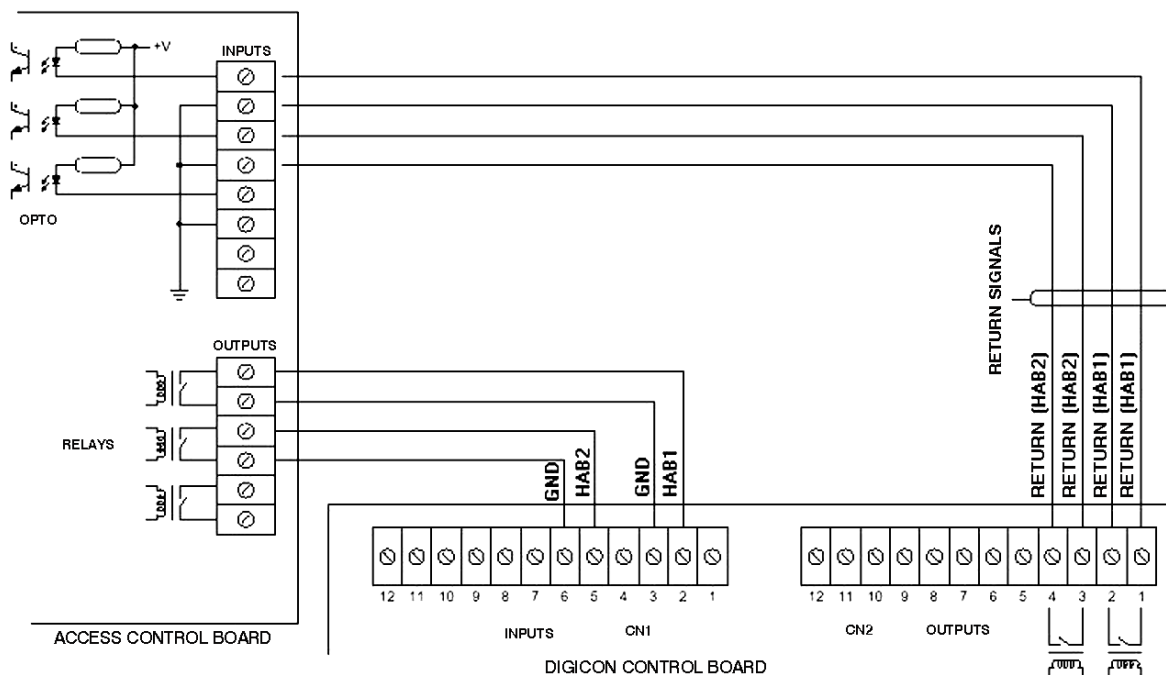
The audible alarm output is activated by an NPN transistor (maximum of 500 mA) whenever the CATRAX Fit:

- receives a release signal (two brief beeps);
- has not been released and is forced for one second (one-second beeps);
- stops in the middle of a turn for more than two seconds (one-second beeps).

Connect the audible alarm according to the figure below.



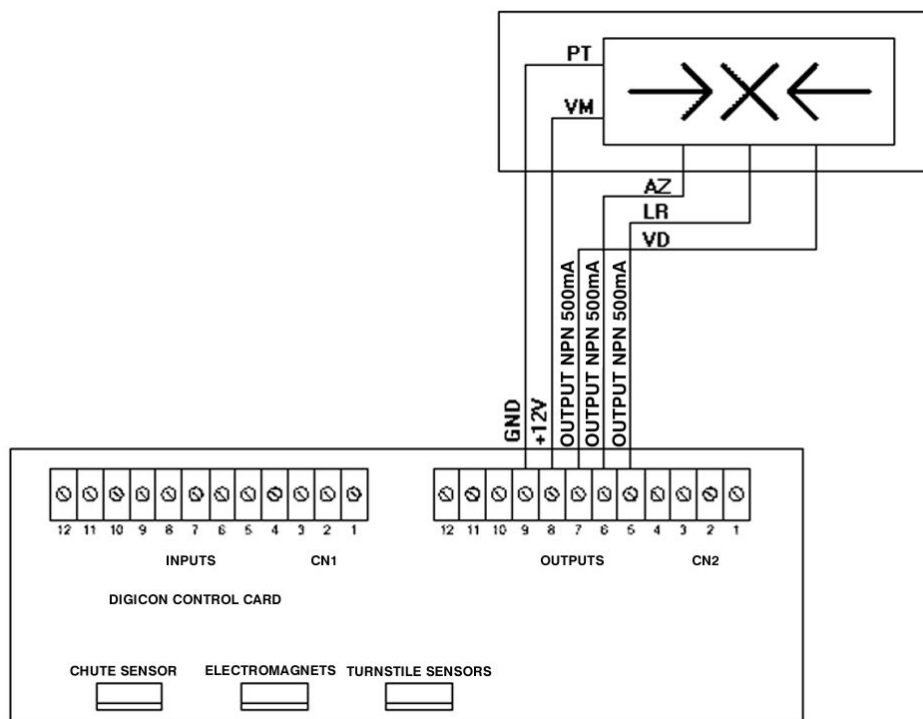
2.4.2.4 Connection diagram



2.4.2.5 Pictogram indicators

Pictogram indicators are activated by NPN transistors (maximum of 500 mA). On activation, a GND signal is sent through the corresponding output.

2.4.2.6 Pictogram connection diagram



2.4.3 Control board configuration – Dip Switch 1

DS 1 is used to configure the following:

- direction of turn;
- maximum time of passage;

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

The table below describes the position of the switches.

	01	02	03	04	05	06	07	08
Release both directions	-	-	-	OFF	OFF	-	-	-
Lock left to right direction	-	-	-	ON	OFF	-	-	-
Lock right to left direction	-	-	-	OFF	ON	-	-	-
Lock both directions	-	-	-	ON	ON	-	-	-
N.O. inputs	-	ON	-	-	-	-	-	-
N.C. inputs	-	OFF	-	-	-	-	-	-
Enable return in the beginning of turn	ON	-	-	-	-	-	-	-
Disable return in the beginning of turn	OFF	-	-	-	-	-	-	-
Enable audible signal in mid turn	-	-	-	-	-	ON	-	-
Disable audible signal in mid turn	-	-	-	-	-	OFF	-	-
Wait for first turn	-	-	-	-	-	-	ON	ON
Wait for 5 seconds	-	-	-	-	-	-	OFF	ON
Wait for 10 seconds	-	-	-	-	-	-	ON	OFF
Wait for 15 seconds	-	-	-	-	-	-	OFF	OFF
Enabling by border	-	-	OFF	-	-	-	-	-
Enabling by level	-	-	ON	-	-	-	-	-

The shaded fields indicate the default configuration of the Digicon board.

2.4.4 Configuration examples

1 – To receive relay pulse (normally open 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 in clockwise direction and to indefinitely release turn in counter-clockwise 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

NOTES

- The control board can be fastened to the mounting rack that comes with the CATRAX Fit.

3 MAINTENANCE

3.1 PREVENTIVE AND CORRECTIVE MAINTENANCE PROCEDURES

Sphere base – Frequency: every 700,000 cycles

The aim of this procedure is to check on the wear of sphere tracks.

Corrective actions:

1. If there is excessive wear (shards, perforations, steel filings or grooves where the sphere runs), replace the part.
2. If the part does not present wear signs, clean and grease it using bearing grease.

Optical sensors – Frequency: at least once a year (depending on environmental conditions)

This maintenance procedure requires the use of a multimeter. In order to verify the need for corrective actions, it is necessary to measure [the?] CN6 when the turnstile is powered, according to the instructions below:

- Set the multimeter to measure DC voltage of up to 20 V. Next, clamp the black pointer to pin 4 and the red pointer to pin 1 of CN6. Voltage should be lower than 0.8 V (non-obstructed sensors). With the pointers in the same position, force the equipment arms in both directions (in one of the directions, the voltage measured by the multimeter should be higher than 4.5 V).
- Repeat the operation clamping the black pointer to pin 4 and the red pointer to pin 3. The results should be the same as those obtained with pins 4 and 1.
- Verify if the sensors present signs of dust.

Corrective actions:

1. If the measurements do not match the standards described above, replace the sensor.
2. Clean the sensors using a clean brush.

NOTE

In excessively dusty environments, perform this maintenance cleaning procedure more than once a year.

Electromagnets - Frequency: every 700,000 cycles

This maintenance procedure requires the use of a multimeter. Disconnect the CN3 from the control board and verify the resistance of the electromagnets. The value should be between 12.5 and 13.5 ohms on pins 1, 2, 3, and 4 of the electromagnet connector. Once the measurement is complete, CN3 should be connected to the board again.

Corrective actions:

1. Replace the electromagnet if one of the following conditions is observed: incorrect resistance, electromagnet in short-circuit or open.
2. If the electromagnet is not working, verify the board and the tension.
3. Tighten the bolts on the base if the electromagnet is loose.

Electromagnet adjustment (if necessary):

1. Force the lock against the sprocket and the equipment arm until the lock is totally inside the first tooth (until the arm is locked).
2. Next, release the fastening bolts and press the electromagnet against the lock buffer so that all its area gets in contact with the electromagnet.
3. Tighten the bolts again.

Lock assembly – Frequency: every 700,000 cycles

In order to verify the need for corrective actions, you should:

- Verify the correct lock position.
- Check whether the lock is fitted to the sprocket or whether there is apparent wear.

Corrective actions:

1. If the lock is incorrectly positioned, verify the retention ring and the spring that tensions the assembly.
2. If the lock is not fitted to the sprocket, replace the lock or the sprocket.
3. If there are signs of wear on the lock end, replace the lock.

Sprocket assembly – Frequency: every 700,000 cycles

To verify the need for corrective actions, you should:

- Verify the wear of the sprocket teeth.

- Check the backlash between the central shaft, the sprocket and the cotter pin.

Corrective actions:

1. If you observe any signs of wear on the teeth, replace the sprocket.
2. If you notice excess backlash between the sprocket and the shaft/cotter pin assembly, replace the sprocket or the cotter pin. To change the cotter pin, use a pulley puller.

3.2 TROUBLESHOOTING

Defect	Possible cause	Action
• CATRAX Fit will not turn on	• Power supply cable is not connected properly. • Power supply fuse is burnt.	• Verify wires and fuse (fuse: 3 A).
• CATRAX Fit is locked	• Optical sensors are obstructed or defective.	• Carry out preventive maintenance procedures in the sensors or contact Technical Assistance.
• CATRAX Fit will not activate electromagnet (turnstile cannot be locked)	• The cable is broken or the distance between the electromagnet and the lock device is inadequately adjusted.	• Adjust the electromagnet or deliver the equipment to Technical Assistance.
• The arm will not stay in the correct position.	• The base of the sphere is worn, dirty, not properly lubricated, or the spring is broken.	• Request replacement of defective part or contact Technical Assistance.
• CATRAX Fit will not lock on the first tooth.	• The distance between the electromagnet and the lock device is not well adjusted.	• Adjust the electromagnet or contact Technical Assistance.

4 TECHNICAL CHARACTERISTICS

Dimensions Fully assembled:	
Front cover and plate	
Internal drawer mount	
Packaging	Height: 103 cm Width: 27 cm Depth: 55 cm
Gross weight	23 kg (+ 2 kg of packaging)
Distance between arms	120 degrees
Electromagnet supply voltage	12 V and 2 A
Sensor supply voltage	5 V and 0.5 A
Power supply unit (not included)	Input: 85 V a 250 VAC Output: 12.3 V $\pm$ 5% / 2 A, and 5 V $\pm$ 5% / 1 A Dimensions: 35 x 51 x 105 mm Distance between holes: 43 x 98 mm Diameter of holes: 3.5 mm
Board with display (see separate manual)	Power supply: 6 to 24 VDC / 100 mA

5 WARRANTY AND TECHNICAL ASSISTANCE

Digicon is responsible for the good quality of the project, labor and materials used in the manufacturing of its products, ensuring the equipment and all its parts to be free from defects as well as material or manufacturing imperfections. Digicon commits itself to replace or repair any part or equipment that presents manufacturing defects, under its exclusive criteria, in its Gravataí factory or in its office in São Paulo, without any expense for the buyer, as long as the following conditions are met:

1. Transportation expenses from and to the Gravataí factory or the São Paulo office will be the buyer's responsibility.
2. The warranty starts on the date of purchase, as recorded in the invoice. The warranty covers:
 - a) 12 (twelve) months for replacement of equipment, accessories and parts;
 - b) 90 (ninety) days for repairs and technical assistance.
3. To benefit from the warranty you must present the invoice (original or copy).
4. The warranty is not applicable in the following cases and conditions:
 - a) defects and damage caused by accidents, negligence, or other incidental damage;
 - b) defects and damage caused by inadequate or prolonged storage;
 - c) defects and damage that may be attributed to inadequate use of the equipment;
 - d) defects and damage caused by improper installation and operation.
5. The warranty will be automatically cancelled if:
 - a) the equipment is modified, adapted or altered by the customer or a third party without expressed consent from Digicon;
 - b) the equipment suffers maintenance or repairs executed by personnel without the authorization of Digicon;
 - c) the equipment has its serial number changed or identification tag violated;
 - d) payment is not received for the quantities and within the time frame indicated in the invoice.
6. Digicon will not be responsible for any damage that may occur in case the equipment is inactivated.
7. Repair of the equipment under warranty will be made at Digicon.

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