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Coin Hoppers

Coin Validator

Coin Accelerator

Shutter

Coin Recyclers

Coin Cashbox

Fig. 47

8.1 Coin acceptor (Shutter + Coin accelerator)

User inserts the coin into the coin entry slot of the shutter.

This device has an extra level of security and deterrent to vandalism by preventing the acceptance of "foreign bodies". The coin entry slot remains blocked to all non-metallic objects and also to any metal items of a lower mass than the requisite coin. Only when a coin is in close proximity to the slot does the sensor then emit a signal, and the machine controller activates the magnet opening the slot.

Once the shutter is open the coins are sent to the **coin accelerator that provides to carry coins to the coin entry of the coin validator**.

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Fig. 48

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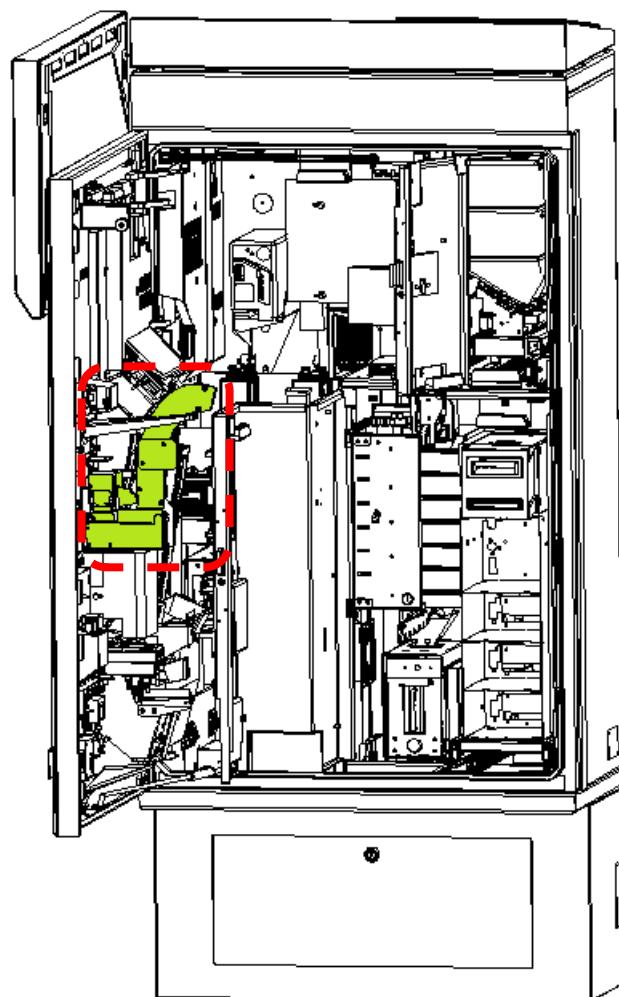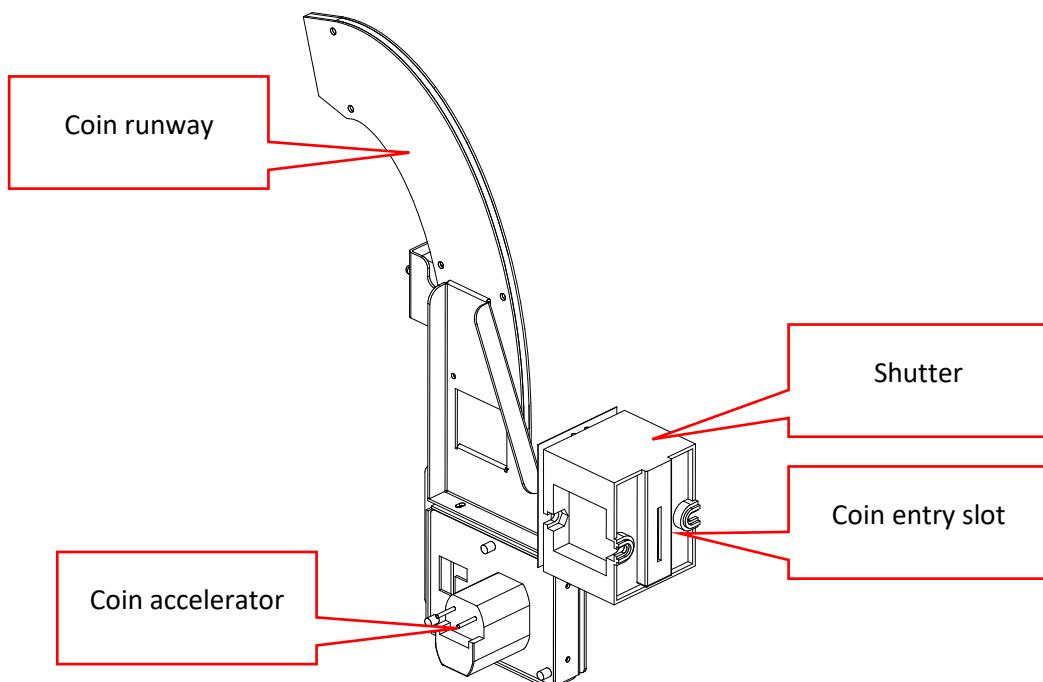
Fig. 49

On the coin accelerator power supply switch is installed a protection cover as shown in the figure below:
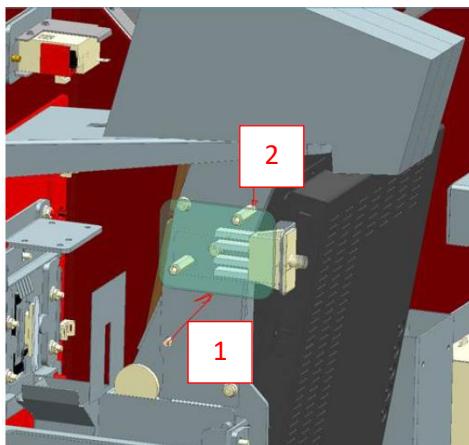
Fig. 50

1. Protection cover
2. Spacer screw

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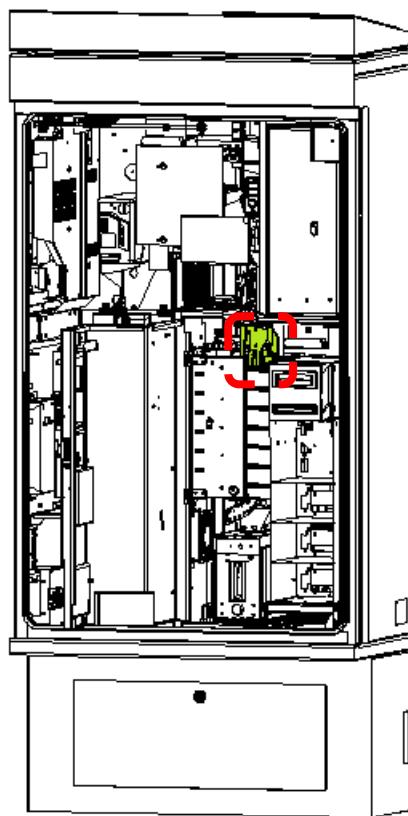
8.2 Coin validator

Fig. 51

The coin validator has an automatic reject lever, that permits to clear any coins that might have got stuck inside and returns the coins to the customer. The coin validation system takes in input the coins inserted by the customer and defines if they have to be accepted or rejected; the rejected coins are conveyed to the coin exit slot. The coin validator sorts coins according to value or by exit slot (towards the customer, to cashbox, etc).

Fig. 52

SIGMA

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8.3 Coin recycler (coin dispenser with recycling)

The coin dispenser is equipped with a 6-way separator to convey the coins inserted by customer: the customer inserts the coins into coin entry slot of the shutter and the coins are conveyed to the coin entry of the **coin validator**.
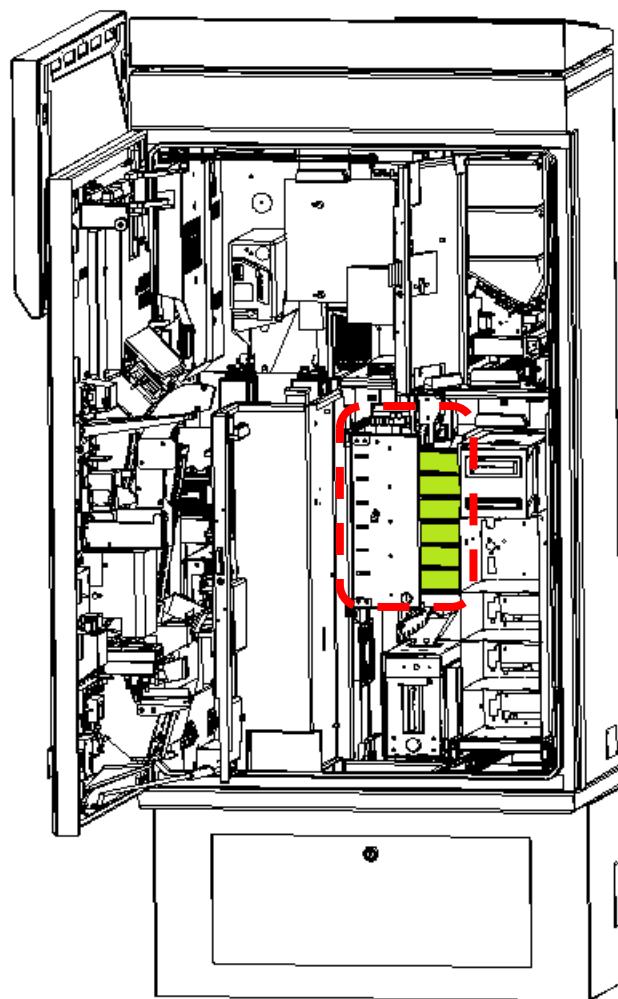

Fig. 53

The coin selector has an automatic reject lever, that permits to clear any coins that might have got stuck inside and return the coins to the customer. The coin validation system takes in input the coins inserted by the customer and defines if they have to be accepted or rejected; the rejected coins are conveyed to the coin exit slot. The coin selector sorts the coins according to value or by exit slot (towards the customer, to cashbox, etc.).

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Fig. 54

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Code: 74000087801   Classificazione: **INTERNAL USE**
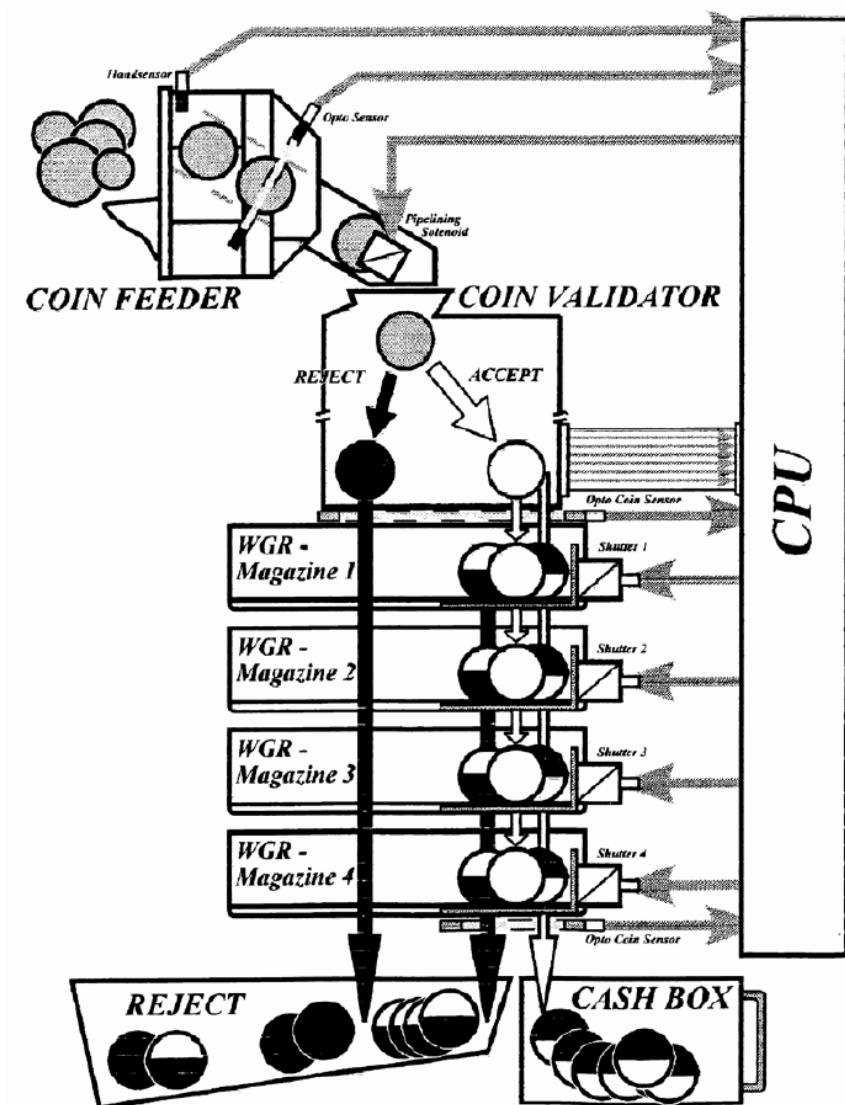
8.3.1   Removing jams

To access the dispenser and remove the cassette you must use the lever placed on the lid, as shown in the figure:

Lever
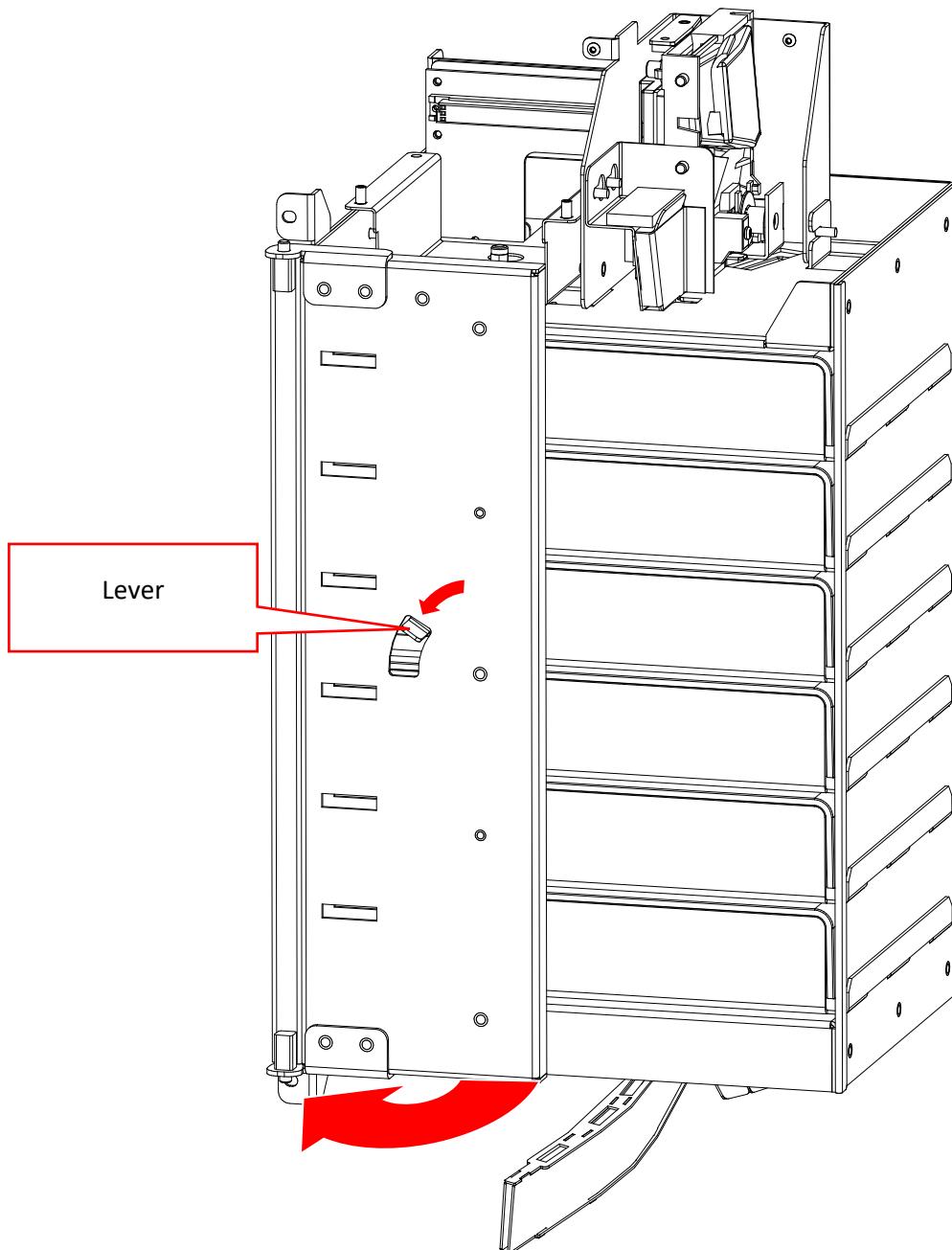
Fig. 55

You can pull out each cassette and remove coins jammed.

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Fig. 56

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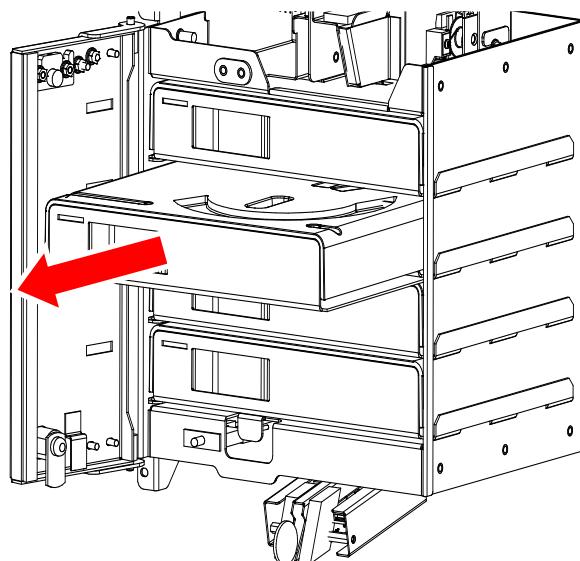
8.4 Manual loading coin dispenser (hoppers without recycling)

The hoppers are positioned inside the upper box. They are installed on a carriage to help the access.

Fig. 57

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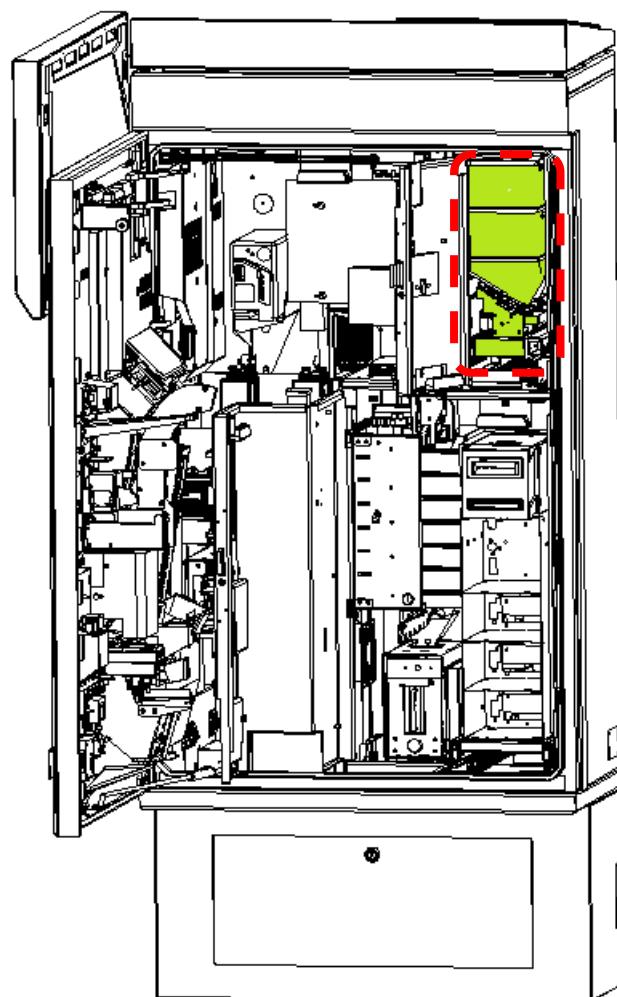
8.4.1   Access to the hoppers

To access to the hoppers, proceed as follows:

1. Open the front-door
2. Open the upper box door
3. Push the lever, positioned on the right of the carriage of the hoppers, as shown in figure
4. Using the handle pull out the carriage

Handle

Fig. 58

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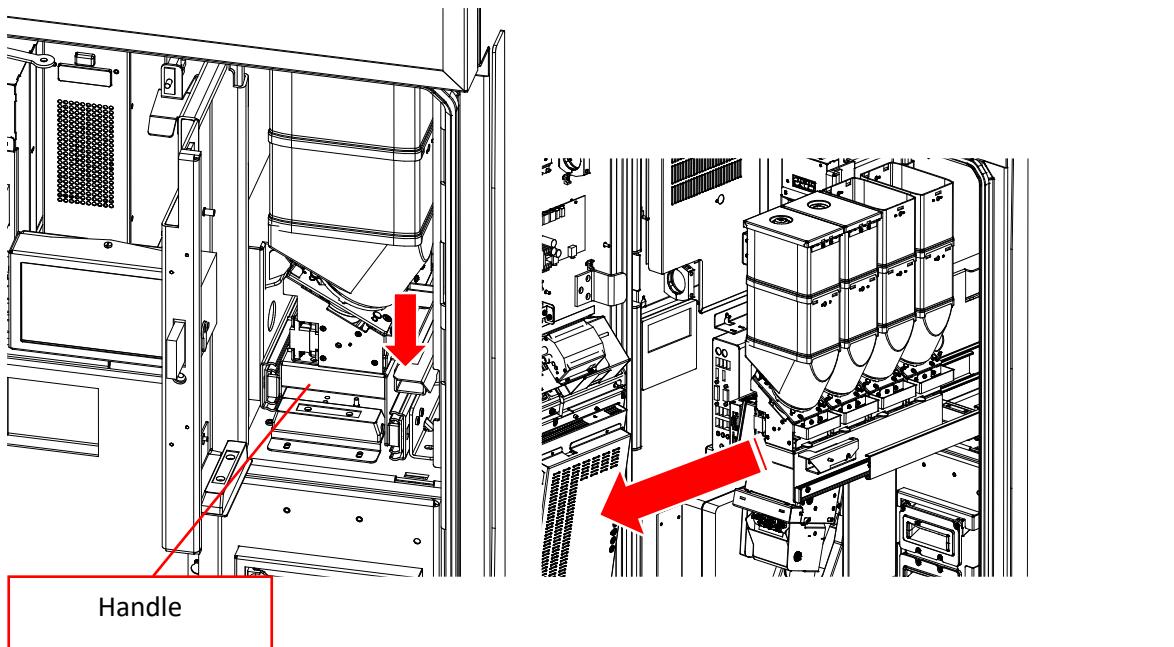
Pull out each hopper as follows:

1. Move to right the lever, positioned under each hopper, as indicated by the arrow in the figure
2. Using the handle pull forward the hopper

| Handle |
| Lever |

Fig. 59

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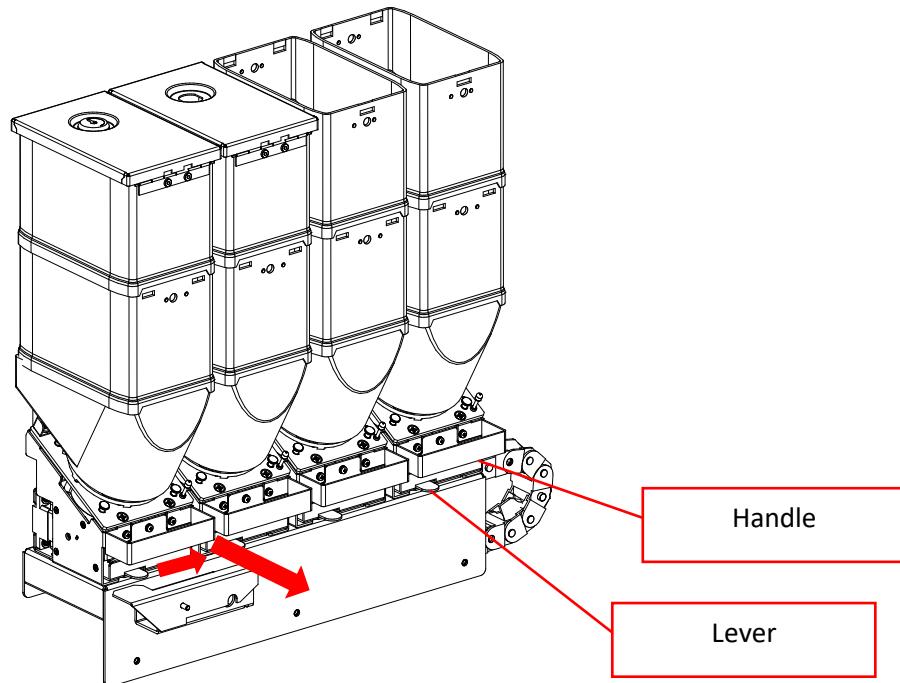
8.4.2   Hoppers loading

To load the hoppers you have to access to them as described in previous paragraph, open the hopper with the appropriate key and then load each hopper with correct value coins, putting the coins into the hopper.

Fig. 60

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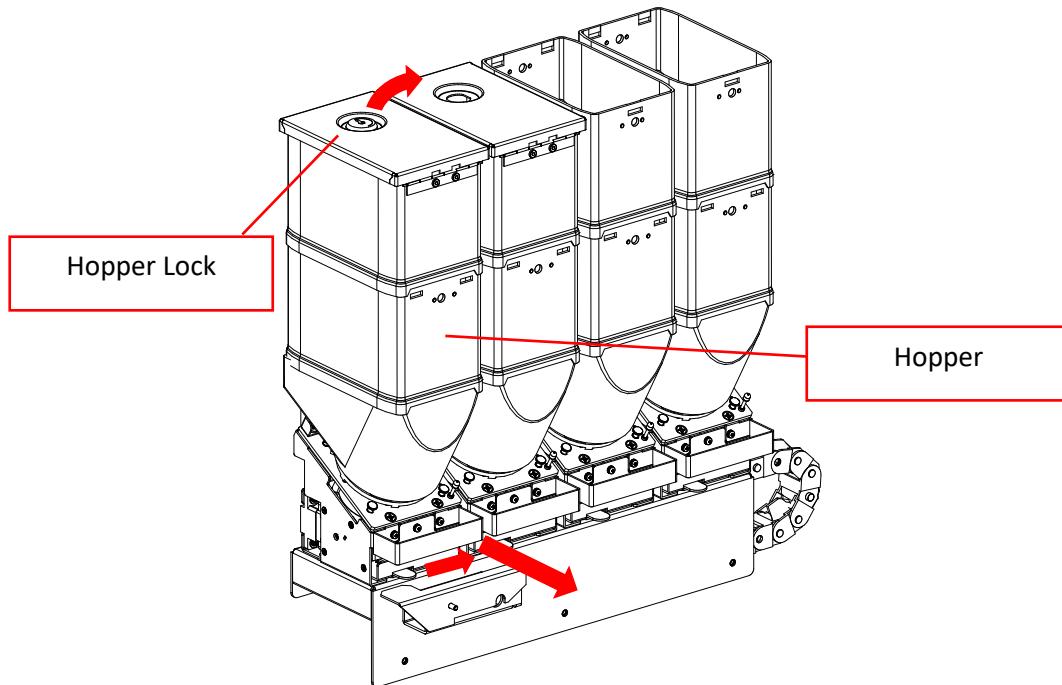
8.5 Coin cashbox

In the cashbox are stored the coins inserted by customer, not recycled, and the coins stored in coin dispenser (with coin recycling) when it is full. The cashbox has an automatically closing system, when the cashbox is removed from its place, the coin entry slot is closed automatically and to open it you have to use the appropriate key.

Fig. 61

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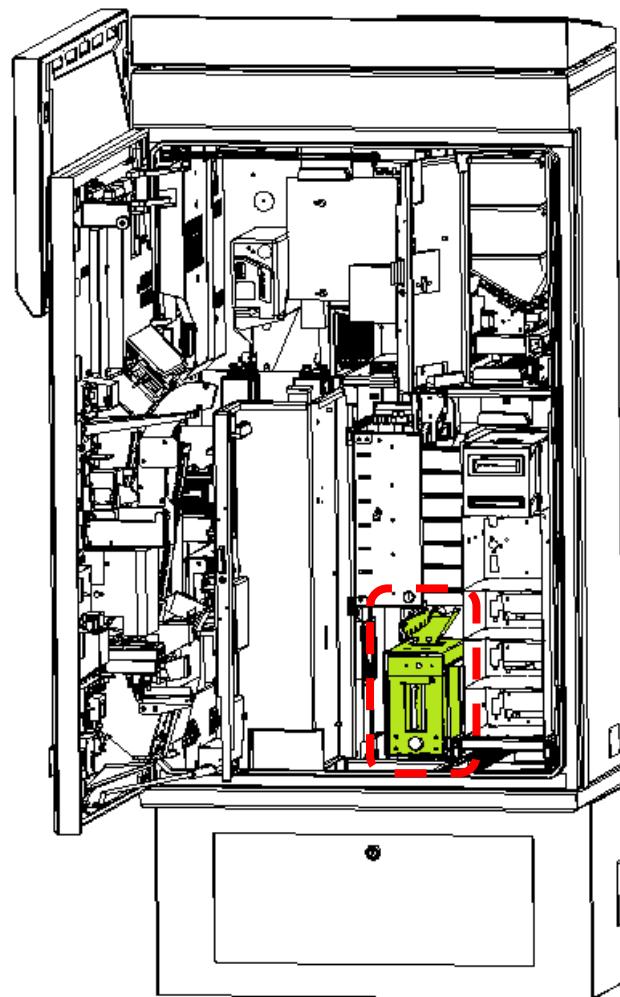
8.5.1   Removing the cashbox

To remove the cashbox proceed as follows:

    5. Open the front-door
    1. Open the lower box door
    2. Insert the key into the lock, positioned below the cashbox handle, and turn it in clockwise (1/4 circle)
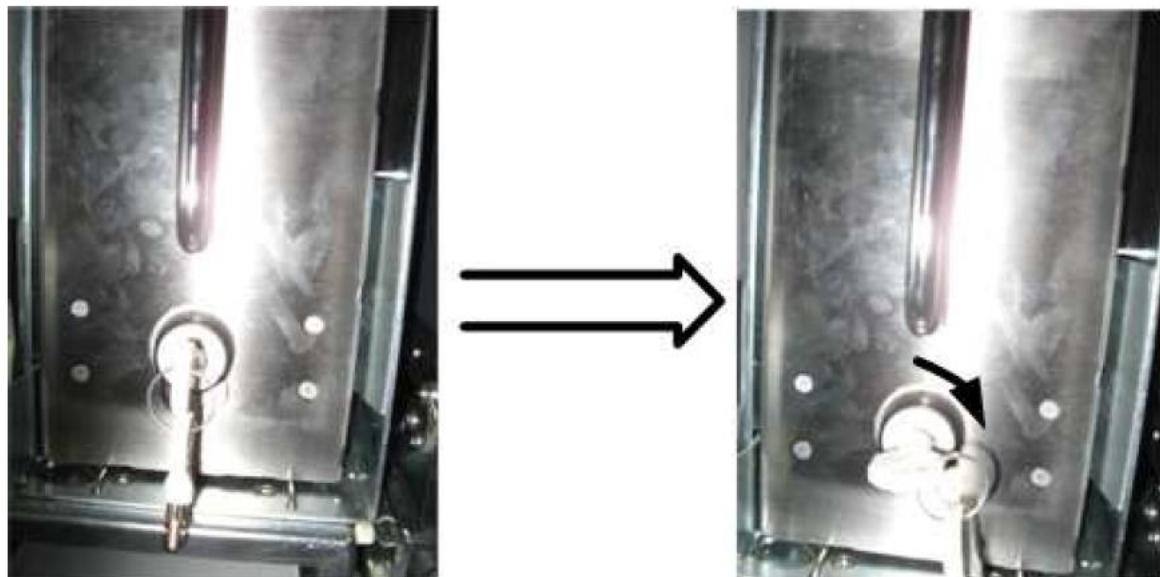
Fig. 62

    3. Using the appropriate handle pull out the cashbox

During removing the cashbox entry slot is automatically closed; using another key (red) you can open it to access inside.

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8.5.2   Opening the cashbox

To open the cashbox perform the following procedure:

1. Insert the red key into the appropriate lock and turn it in clockwise (1/4 circle)
2. Slide the metal cover in the direction of the arrow in the figure below
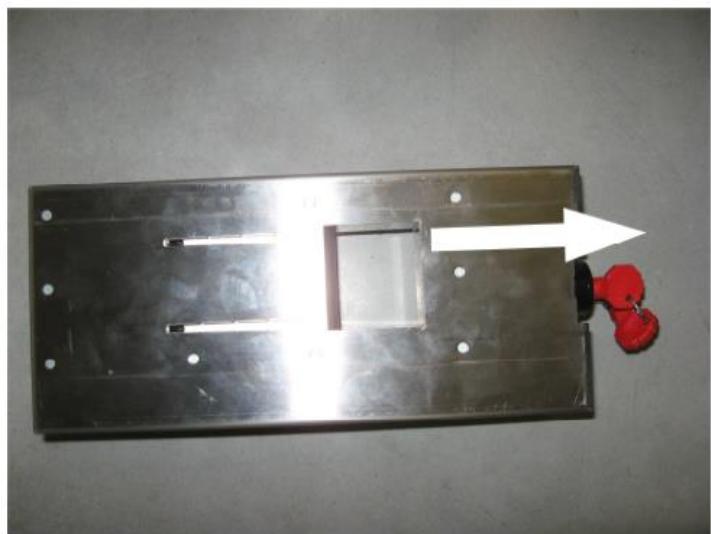
Fig. 63

3. Lift up the cover.

Fig. 64

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Code: 74000087801   Classificazione: **INTERNAL USE**
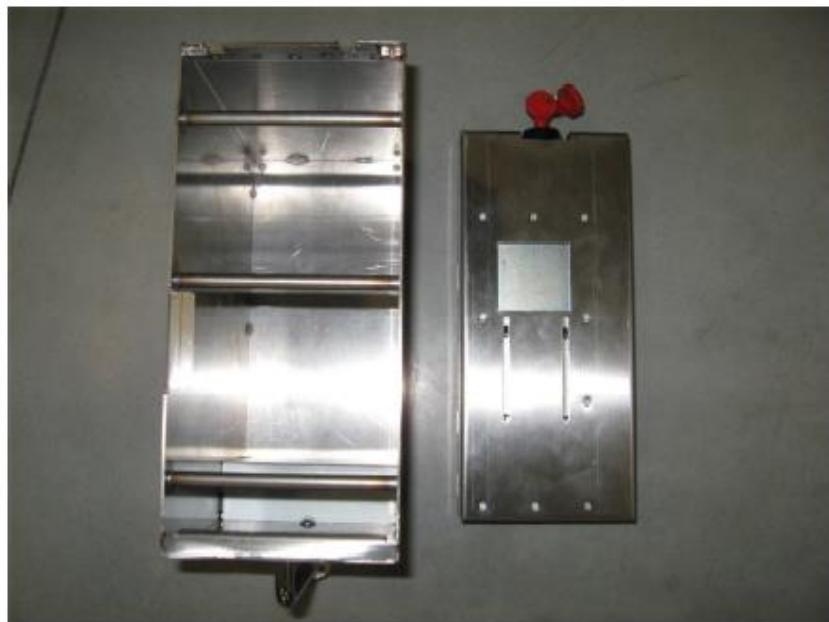
8.5.3   Placing the cashbox

⚠️

Before placing the cashbox you have to arm it

In the following figure is shown how to arm the metal cover before positioning it on the cashbox
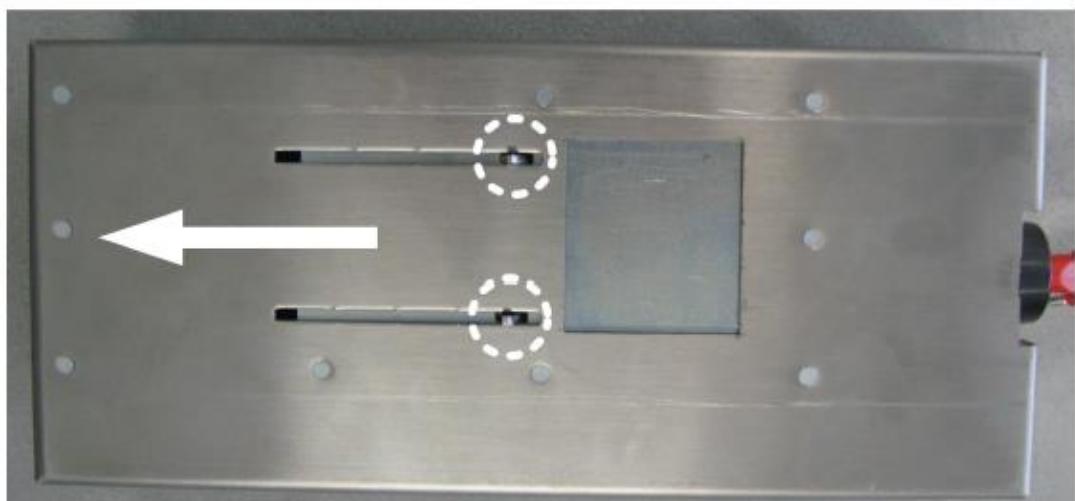
Fig. 65

In the following figure is shown the armed metal cover:

Fig. 66

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When the cover is armed, proceed as follows:

1. Position the cover on the cashbox
2. Turn the red key in anticlockwise (1/4 circle) and remove it
3. Insert the cashbox in its appropriate location inside the lower box
4. Verify that on the front part of the cover there is the green indication shown by the arrow in the figure below (the cashbox is armed); if the green indication is not present, extract the cashbox and rearm it as described in this paragraph.

Fig. 67

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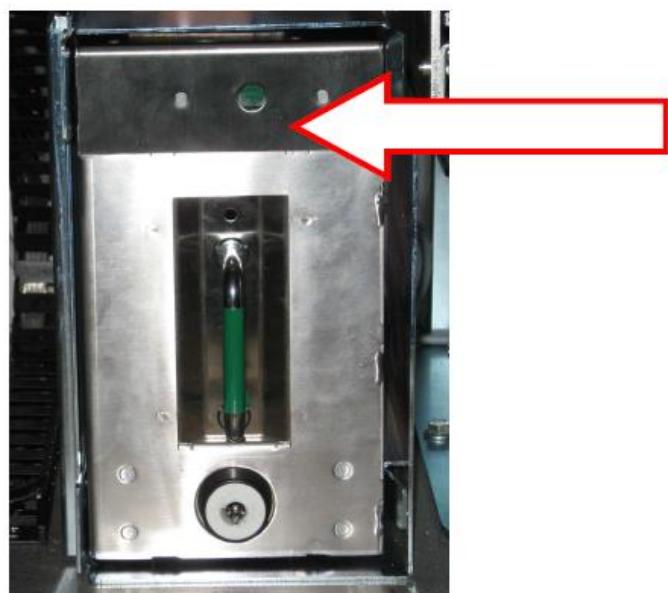
9. Banknote Acceptor/Dispenser

The banknote acceptor/dispenser allows customers to insert banknote, one at time, to make the payment.

It is equipped with 2 slots: one for inserting the banknotes and another that gives the change to the customer.

The banknote acceptor/dispenser architecture includes:

	MAIN MODULE	**Main Module**: A user-friendly interface for accepting and dispensing notes. Accepts notes in any condition and at any angle, validates for authenticity, and dispenses change in bundles of up to 20 banknotes. Includes a 20-notes escrow facility.
	CASHBOX	**CashBox Module**: A lightweight, durable, removable and lockable cassette that securely stores up to 600 (small) or 1500 (large) banknotes.
	LOADER	**Loader** Facilitates a closed-loop cash process through a lockable/removable cassette with 300-note capacity. Used to initialize the recyclers and replenish system with notes as needed.
	RECYCLING MODULES	**Recycler Module**: Each module features a 20 and a 60 note currency recycler that accepts currency in any condition, making the BNR capable of recycling four denominations

Fig. 68

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The banknote acceptor/dispenser is composed of several modules as shown in the figure.

In the figure above is shown the device in full configuration while the system ETS90 is equipped with a banknote acceptor/dispenser composed of

- 1 **Main Module**,
- 1 **Cash-box Module large (1500 banknotes)**
- 1 Loader
- 1 **Recycler Module**

The banknote acceptor/dispenser is located inside the safe as shown in the figure below.

Fig. 69

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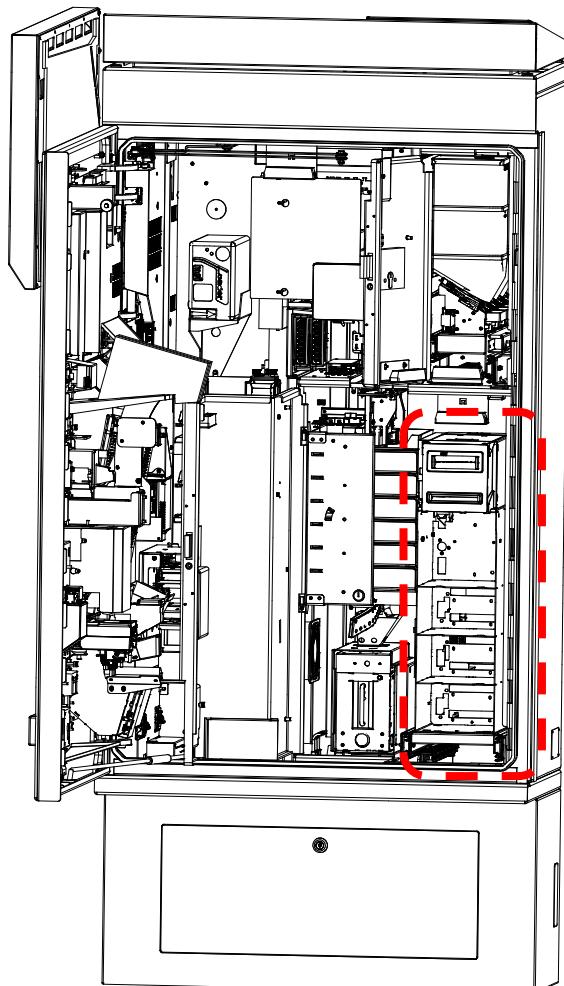
9.1 Indicator LEDs

The status **indicators LED** displays system status, in case of malfunction the LED colour indicates the status.

The banknote acceptor/dispenser has **two kind** of status indicator LED:

- External indicator - MAIN MODULE
- Internal modules indicator

9.1.1 External indicator LEDs

The external indicators on Main Module consist of two pairs of arrows:

- one pointing the **inlet slot**,
- the other pointing the **outlet slot.**

Inlet LEDs can be lighted in green or in red. **Outlet LEDs** can be lighted in green only

These arrows give indications about the transaction to the user, and they give Warning and Failure indications

to the maintenance people.
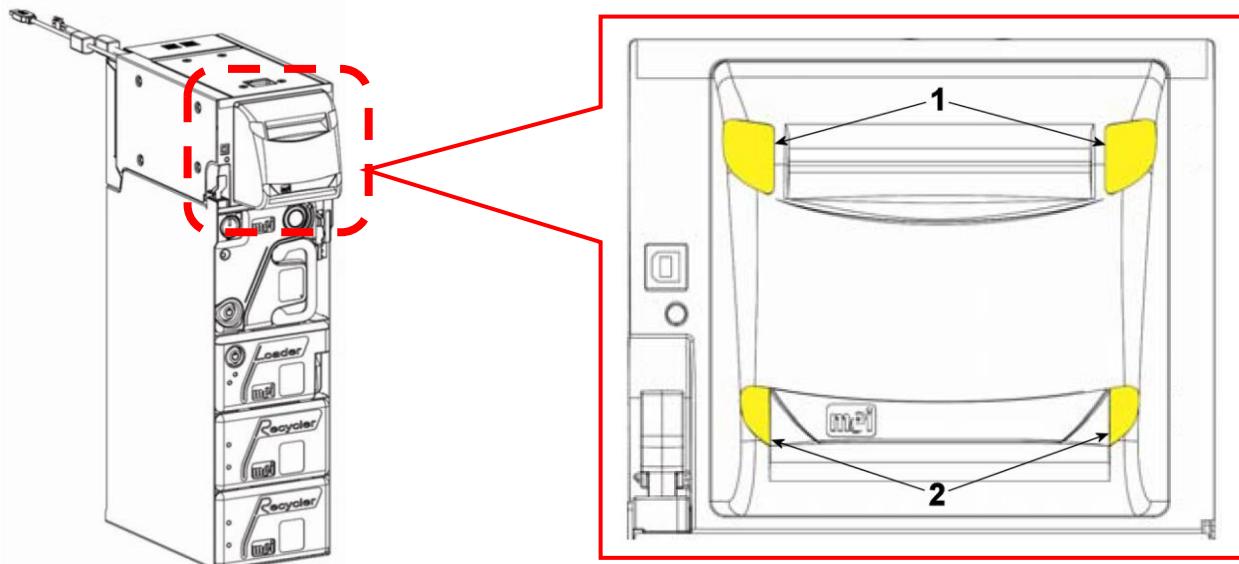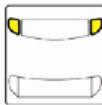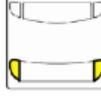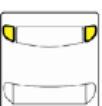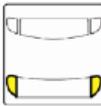
Fig. 70

1. **INLET arrows**
2. **OUTLET arrows**

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These LEDs give indications about the transaction to the user, and give warning and failure indications to the

MAIN MODULE	MAIN MODULE	STATUS	YOU HAVE TO
OFF	OFF	INSERTION DISABLED	TAKE NO ACTION
GREEN Solid	OFF	A BANKNOTE CAN BE INSERTED	INSERT A BANKNOTE
GREEN blinking (1 flash)	OFF	A BANKNOTE RETURNED TO THE INLET	PULL THE BANKNOTE OUT
OFF	GREEN blinking (1 flash)	BANKNOTES ARE GIVEN OUT AT THE OUTLET	WHITDRAW THE BANKNOTES

- Other indications

MAIN MODULE	MAIN MODULE	STATUS	YOU HAVE TO
RED	OFF	NOT OPERATIVE	COMMAND RESET
RED Rapid blinking (3 per sec.)	OFF	NOTE JAM	REMOVE JAM

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9.1.2   Front LED Indicator

Each BNR module has front located LED indicators giving global information on its status. Each LED will illuminate green or red depending on the status:

- GREEN → OK
- RED → FAILURE

**Fig. 71**

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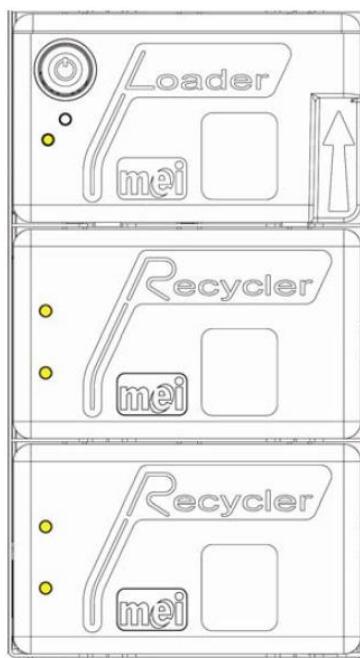
9.1.3   Spine indicator LED

The Spine has a LED indicator that provides its status. This indicator will illuminate green or red.

Fig. 72

- GREEN -> OK
- RED -> FAILURE

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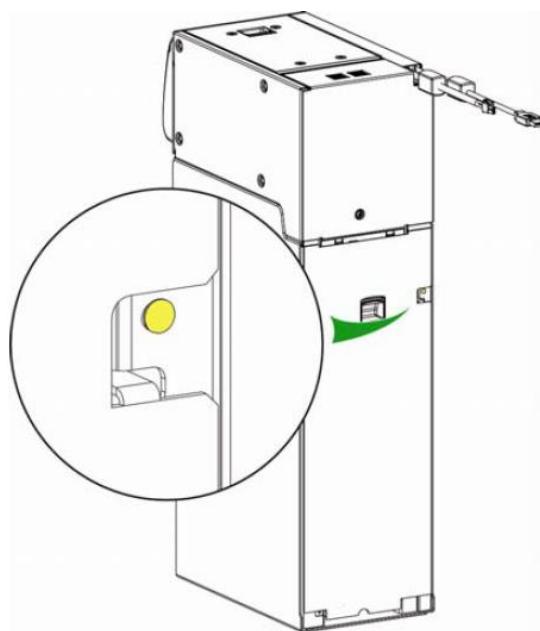
Code: 74000087801   Classificazione: **INTERNAL USE**

9.1.4   Indicator LED table

Observing the status of LEDs it is possible to solve some problems. Refer to the table shown below:

MAIN MODULE	MAIN MODULE		CASHBOX	STATUS	YOU HAVE TO
OFF	**OFF**	**OFF**	-	LOCKED	TAKE NO ACTION
GREEN blinking (1 flash)	GREEN blinking (1 flash)	GREEN blinking (1 flash)	-	**RESET REQUIRED**	AFTER BNR SWITCH-ON RESET THE BNR
OFF	**OFF**	GREEN	GREEN	**OPERATIONAL**	TAKE NO ACTION (CaskBox ready to insert)
OFF	**OFF**	RED Slow blinking (1 flash)	-	**LOADER EMPTY**	LOAD BANKNOTES IN LOADER
OFF	**OFF**	RED Rapid blinking (3 per sec.)	-	**STATUS NOT OK (Re,Lo)**	CONFIGURE THE MODULE
RED Rapid blinking (3 per sec.)	**OFF**	RED Rapid blinking (3 per sec.)	-	**BILL JAMMED IN THIS MODULE**	CLEAR THE JAM
RED	**OFF**	RED	-	**NOT OPERATIONAL**	RESET COMMAND IS REQUIERED
-	-	-	GREY	CASHBOX FULL OR NOT REARMED	EMPTY THE CASH BOX AND RE-ARM IT

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9.2 Interlock System

The BNR is secured with several locks to prevent unauthorized access to the stored money.

|	
Interlock System: it is composed of a **lock** and a **lever** to secure all cash modules. In the figure is shown the Interlock System correctly locked	

Locked position   Unlocked position
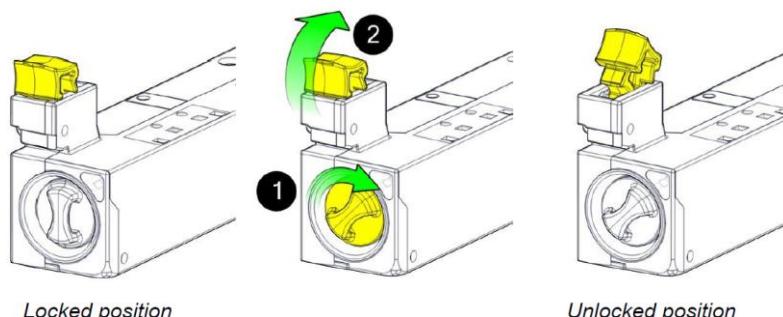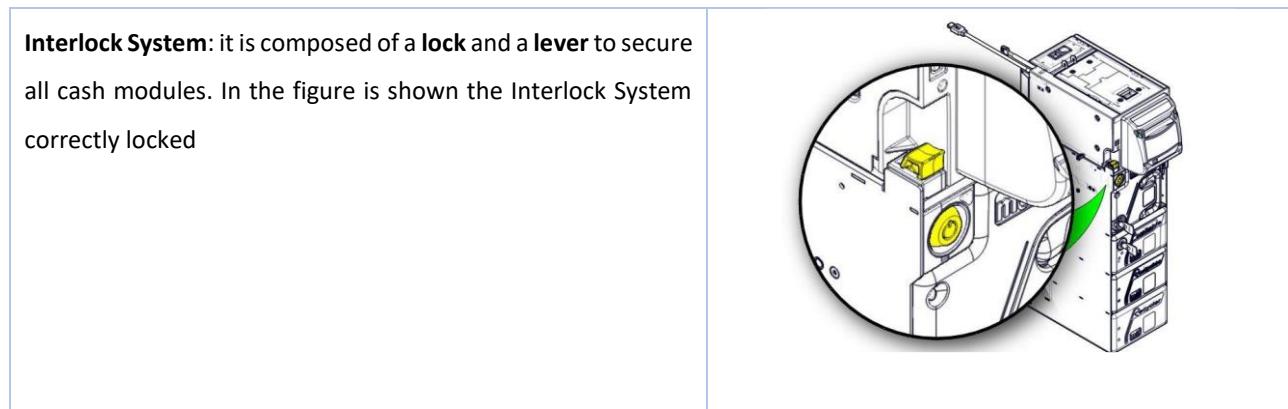
Fig. 73

9.3 Cashbox

9.3.1   Cashbox removing

|	
You need to release the Interlock System to remove the Cashbox 1. Insert the key and turn it clockwise **(1)** 2. Pull general locking yellow lever down **(2)** 3. Remove the Cashbox using the appropriate yellow handle **(3)**	

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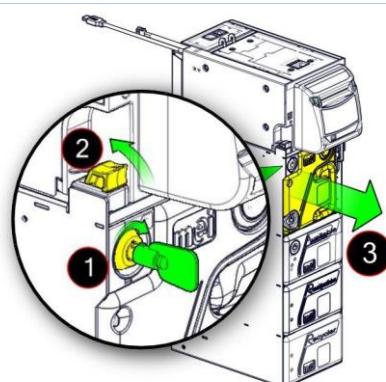
9.3.2   Opening/Closing cashbox

To perform this operation place the Cash-box on its side, as shown in figure.

To open or close the Cash-box Module, once extracted, proceed as follows: 1. Hold down the lid of the Cash-box **(1)** 2. Insert the appropriate key **(2)** 3. Turn the key in the direction indicated by arrows in the figure **(3)**	
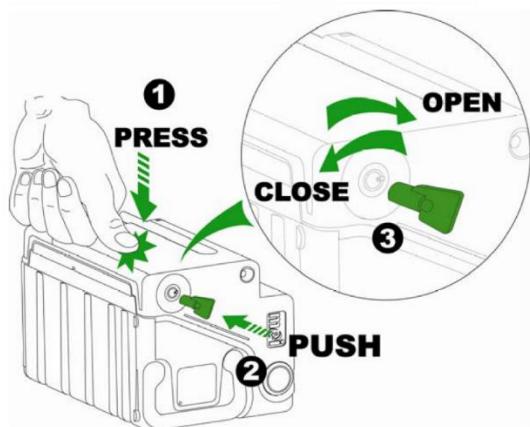
9.3.3   Insert cashbox

If the LED is GREEN the Cash-box can be inserted, if the LED is GREY the Cash-box must be armed by opening it, removing all the notes present and closing it.


Fig. 74

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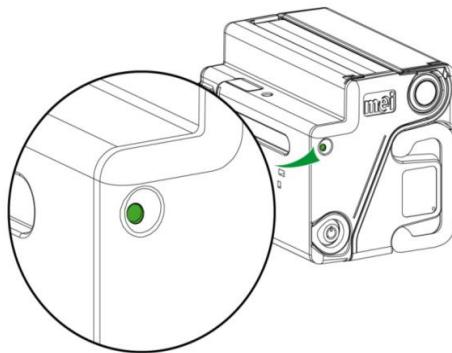
To reinsert the Cashbox module, proceed as follows:

1. Insert the Cash-box until the end **(1)**
2. Lift the yellow lever **(2)**
3. Insert the key and turn it to the left **(3)**
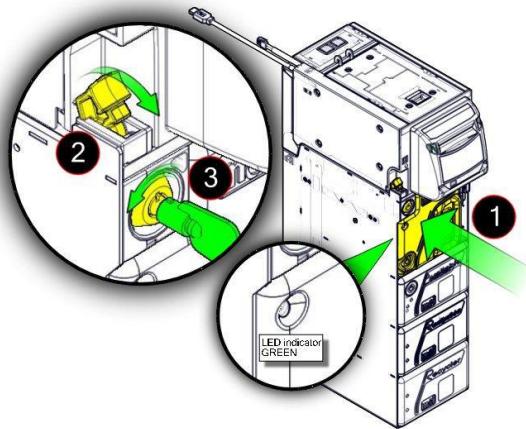
9.4 Loader cassette

9.4.1   Loader cassette removing

You need to release the Interlock System to remove the Loader cassette

1. Insert the appropriate key and turn it clockwise **(1)**
2. Lift up the locking mechanism **(2)**
3. Remove the loader **(3)**

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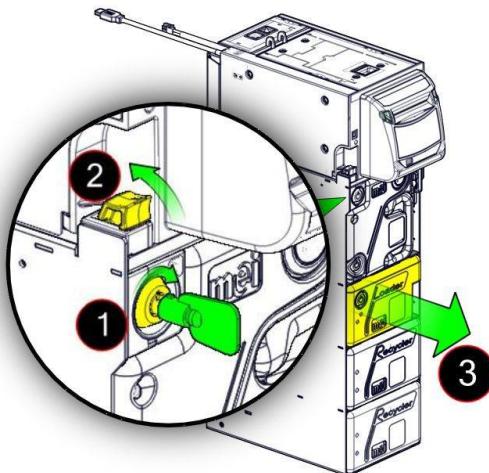
9.4.2   Loading banknotes in Loader

The banknotes to be inserted in the Loader must have the characteristics defined in the following table:

Banknote capacity and quality	
Maximum number of banknotes	250 ± 50 depending on the denomination, the state of the banknotes and the climatic conditions.
Banknote width	From 60 to 81 ± 1 mm
Banknote length	From 120 to 176 ± 1 mm

To ensure the performance of the machine, all operators involved in the loading must be trained in note preparing and loading procedure
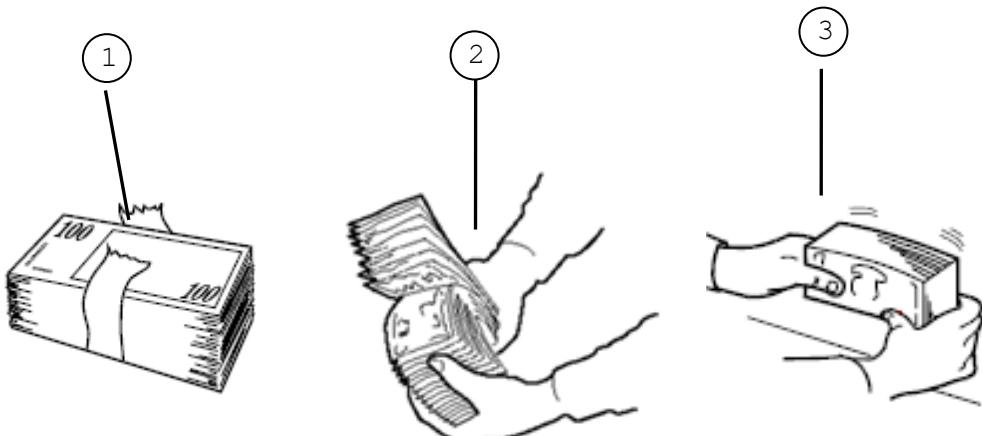

Fig. 75

1. Remove the band around each bundle of notes.
2. separate the notes from each other by flipping through each bundle of notes in both directions at both end or using a note counter.
3. align the edges of the notes in both planes by holding a bundle loosely between the fingers and thumbs of both hands and tapping lightly on a flat surface then tapping the note ends.

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Use only banknotes in good condition, do not use banknotes with the characteristics listed in the table below:

	With adhesive tape or scotch tape applied, with paper clips, staples, pins or foreign objects attached to the banknote. With writings, spots or stamps larger than 100mm^2.
	With more than ¼ of the length folded or missing. There must be no holes, folds or cuts.
	Machine washed, excessively worn or faded.
	Two or more banknotes stuck / glued together
	Wet or damp banknotes.

Fig. 76

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To load the banknotes, follow the procedure below:

- To open the Loader Cassette: press slightly on the box (1), insert the key (2) and fully turn the locking latch clockwise (3).
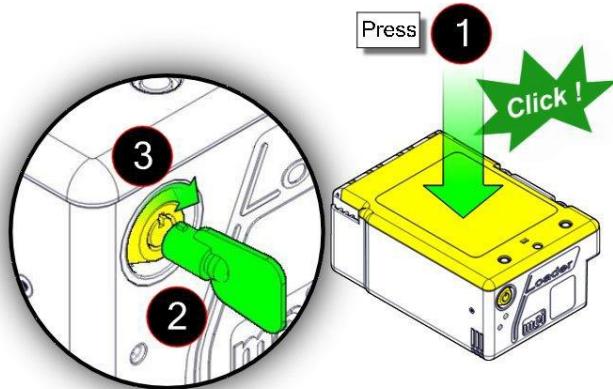

Fig. 77

- Fully open the door until it stops.

Fig. 78

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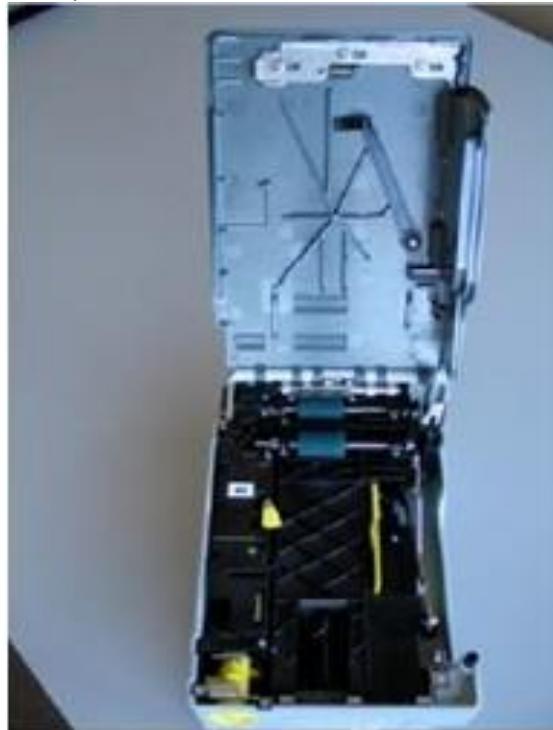
- Release the little yellow latch and lift the "max level detection plate".
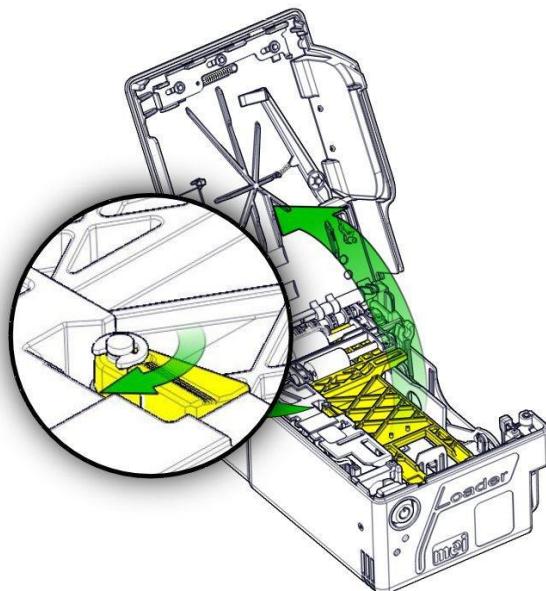
Fig. 79

- Push the pressure plate down to the stop. The pressure plate will lock at the bottom of the Loader Cassette.


Fig. 80

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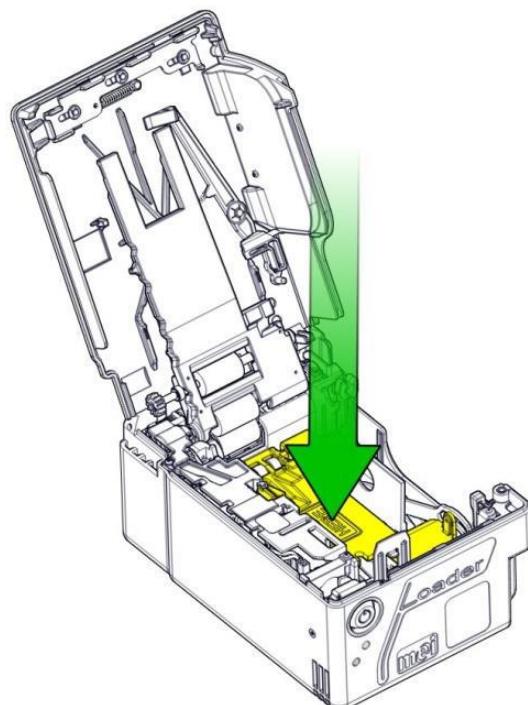
- Lift (1) and flip (2) the lateral bill guide flap down.
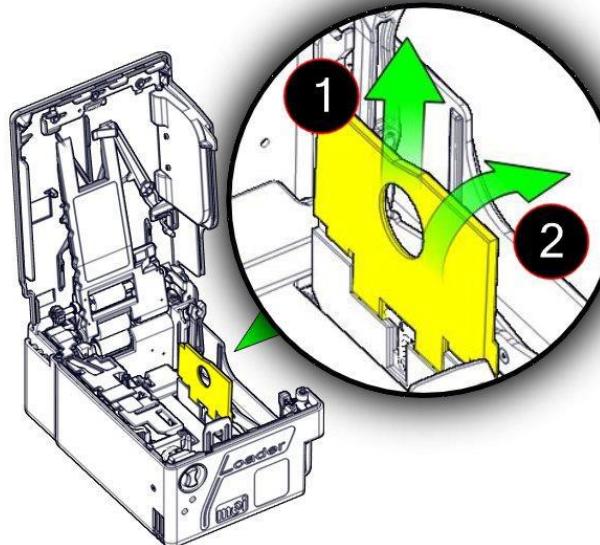
Fig. 81

- Place banknotes into the Loader. Reposition the lateral bill guide flap up.

Fig. 82

- Reposition the "max level detection plate". With the max level detection plate down, check that the bill level flag is green. If the flag shows red remove some bills until the flag turns green with the detection plate down.

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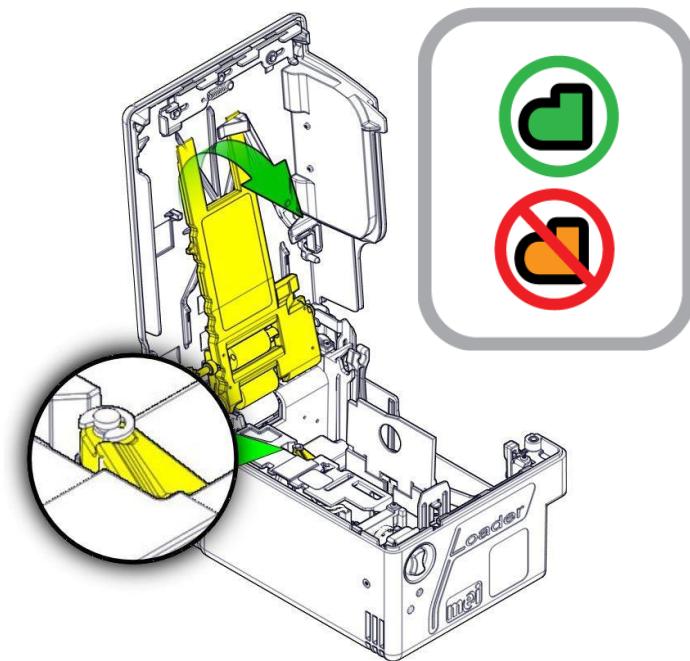
Fig. 83

⚠️ do not over fill the Loader Cassette and do not force the "max level detection plate" closed.

- Close the Loader Cassette by slightly pressing the box (1), inserting the key (2) and slightly turning it clockwise (3), and then fully turn the key vertical in order to release the pressure plate mechanism. A "click" will occur after the key is turned vertical and ensures that the Loader Cassette is correctly closed.


Fig. 84

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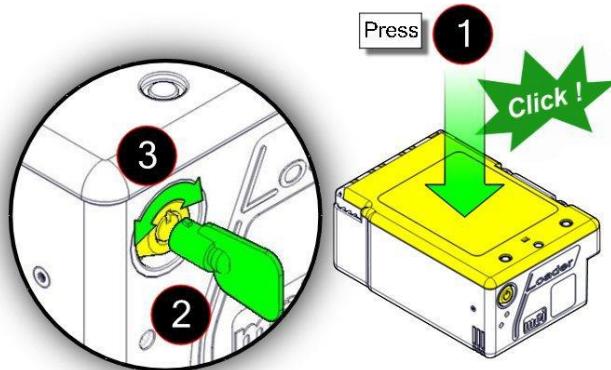
9.4.3   Insert Loader

To reinsert the Loader module, proceed as follows

1. Put the Loader Cassette back in place **(1)**
2. Lock the Interlock System with lever **(2)**
3. lock **(3)** using the key.
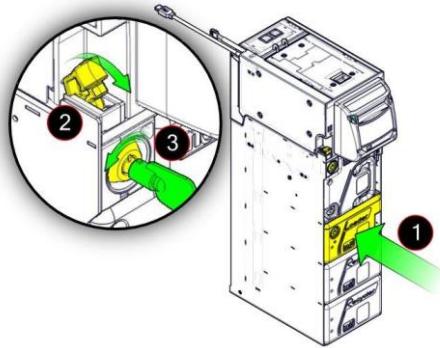
9.5 Recycler Module

9.5.1   Recycler module removing

To remove a Recycler, you need to release the Interlock System and remove the Loader Cassette.

Once the Loader Cassette is removed you can see the Recycler lock.

1. Raise up the Loader locking pin (1) in the back of the chassis and position the key, to unlock the first Recycler.
2. Push and turn the key 90° to the right (2),
3. Remove the key before removing the Recycler A (3). Same handling for the Recycler B if you need to remove it (there is no locking pin in the back of the chassis for the lower Recycler)

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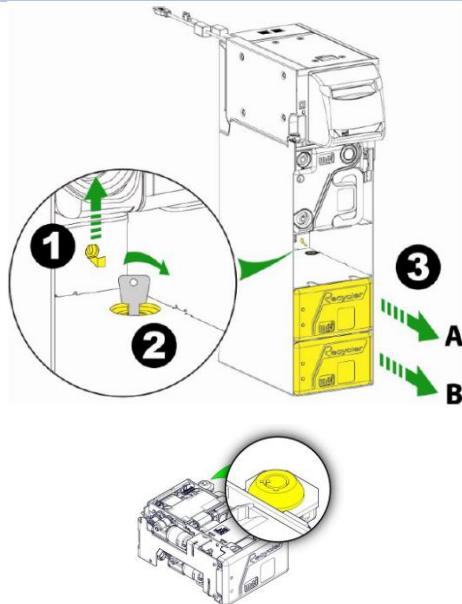
9.5.2   Recycler manual emptying

This procedure is necessary when the stored banknotes are not valid or you want to reinitialize the Recycler Module

The steps to follow are:

1. Remove the Recycler, as explained in the previous chapters and Position it on a table so that the front side is in front of you

Once the module has been extracted, the Recycler Modules will be emptied.

Each Recycler Module can contain up to **2 different denominations** of banknotes because inside it is divided into Upper Recycler (upper part of the module) and Lower Recycler (lower part of the module), the latter larger than the previous one;

It is necessary to empty the Upper Recycler first and then the Lower Recycler

To empty the Upper Module proceed as follows:

2. On the right hand side, hold the white puck labeled "**Load 30**" (1) and on the left hand side, pull and hold the "disengageable" gear in order to decouple the gears (2).

Fig. 85

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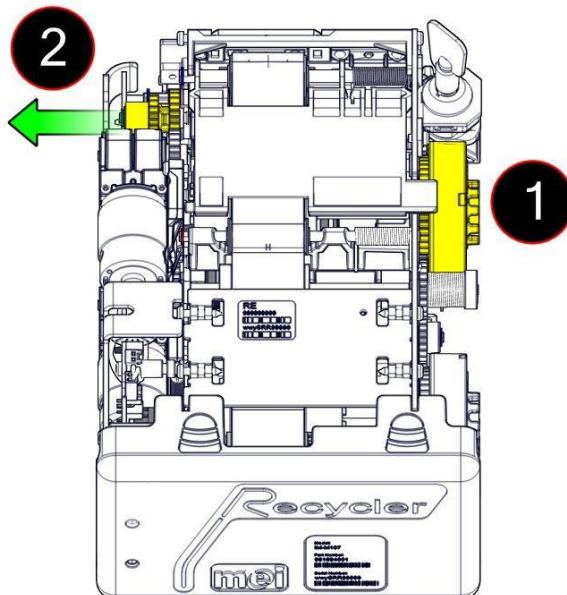
Manually turn the white puck on the right hand side clockwise. The banknotes move to the exit on the backside of the Recycler
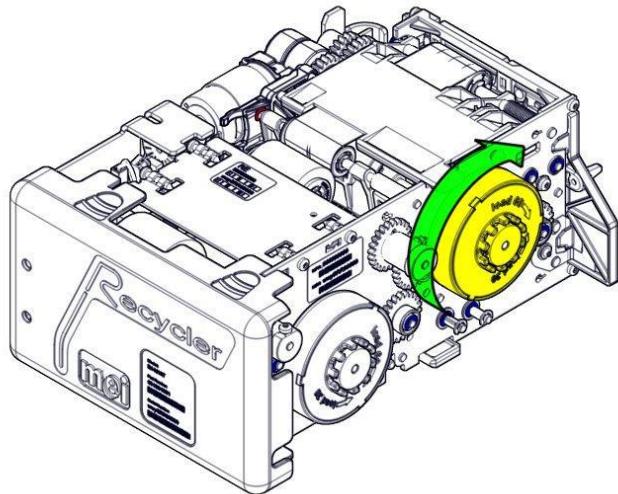

Fig. 86

Do not attempt to disassemble or destroy the spring box as the flat spring roll would release itself and may injure someone


Fig. 87

⚠️ **Do not release the white puck, otherwise the system will rewind.**

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The banknotes will appear at the exit in back of the Recycler

1. Continue to turn the white puck until all banknotes are removed from the Recycler

   When the banknotes are emptied from the Recycler, release the "disengageable" gear first and then release the white puck.

2. Reinstall the Recycler

To empty the Lower Module proceed as described for the Upper Module using however

1. On the right hand side, hold the white puck labeled "**Load 60**".
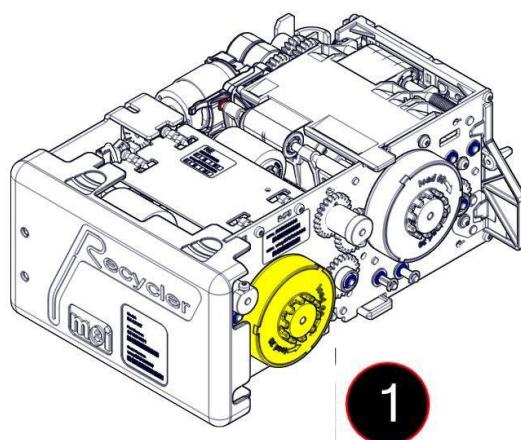
Fig. 88

2. On the left hand side, pull and hold the "disengageable" gear in order to decouple the gears

Fig. 89

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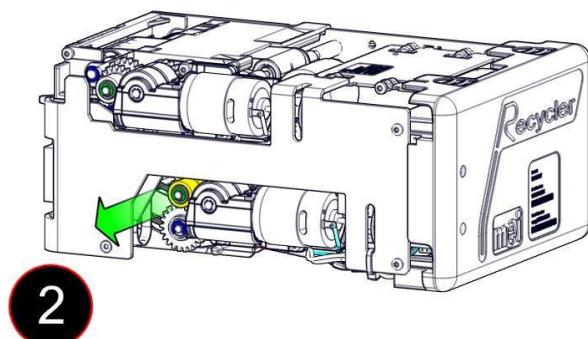
3. Manually turn the white puck on the right hand side counter clockwise.

   The banknotes moves to the exit on the back side of the Recycler
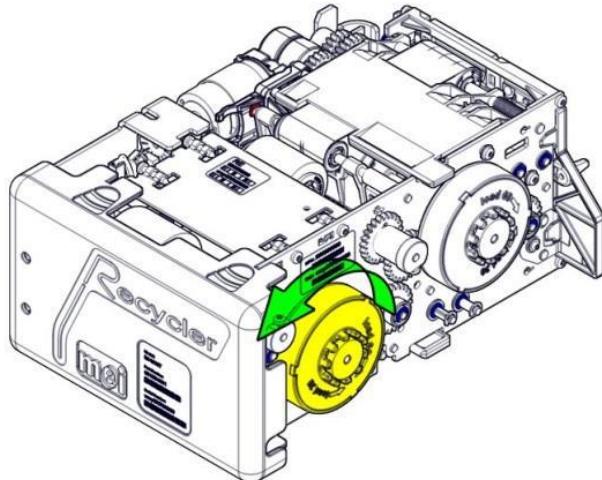
Fig. 90

⚠

Do not attempt to disassemble or destroy the spring box as the flat spring roll would release itself and may injure someone
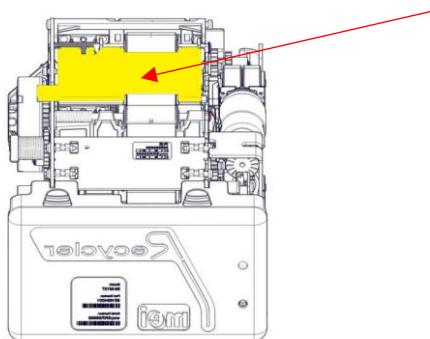

Fig. 91

⚠

Do not release the white puck, otherwise the system will rewind.

The banknotes will appear at the banknote exit located at the back of the Recycler.

- Continue to turn the white puck until all banknotes exit from the Recycler.
- When the Recycler is emptied of all banknotes, release the "disengageable" gear first and then release the white puck

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9.5.3   Insert recycler

To reinsert the recycler, proceed as follows:

1. Insert the modules until the end **(1)**
2. Insert the key and turn it to the left **(2)**
3. Put down the Loader locking pin **(3)**

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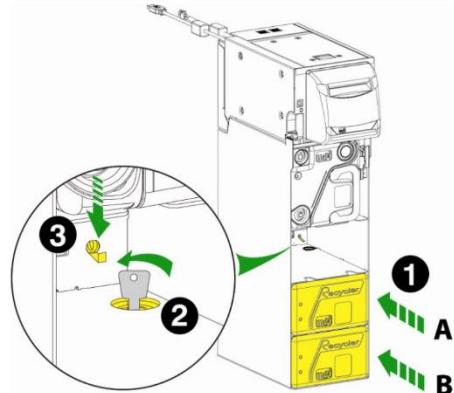
9.6 Jam clearing

9.6.1   1° level jam clearing

The first level jam can be resolved by the operator.

To remove the jammed notes, it is possible to access in **3 parts** of the system.

To allow inspection of the three main paths, it is necessary to extract the system, pulling the guide forward, as specified in the figure.


Fig. 92

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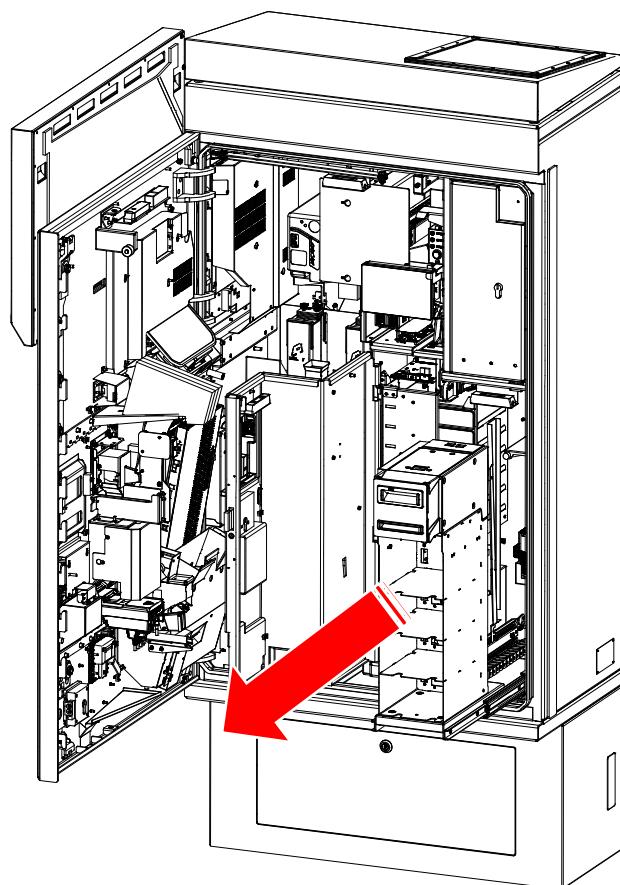
Pushing the appropriate buttons you can open the 3 covers, as shown:
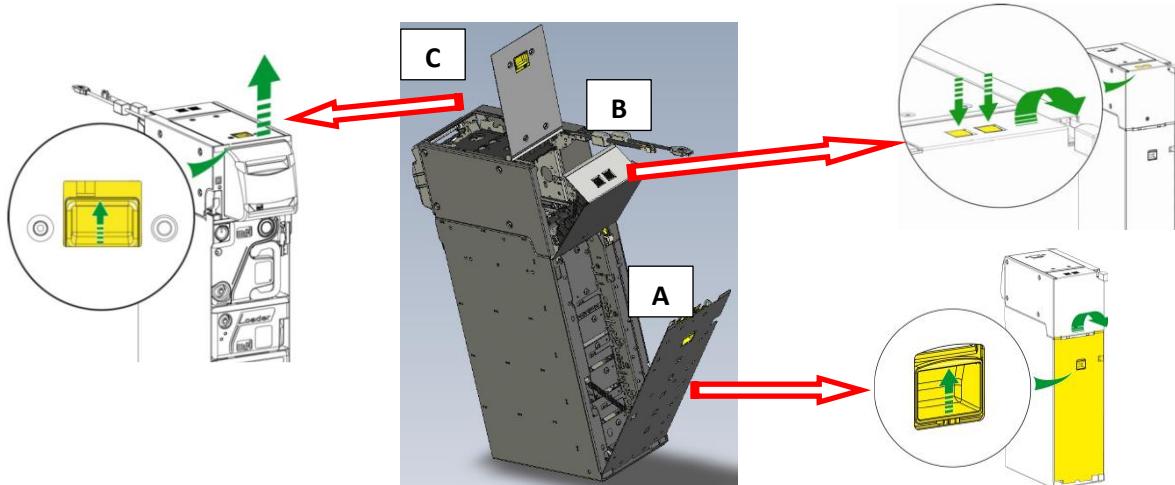

Fig. 93

A. **Spine door**
B. **Recognition sensor door**
C. **Positioner door**

9.6.1.1 Opening Spine door "A"

To access to unit "**A**" perform the following procedure:

1. Lift up the yellow lever
2. Open the door
3. Remove the note
4. Close the door

Fig. 94

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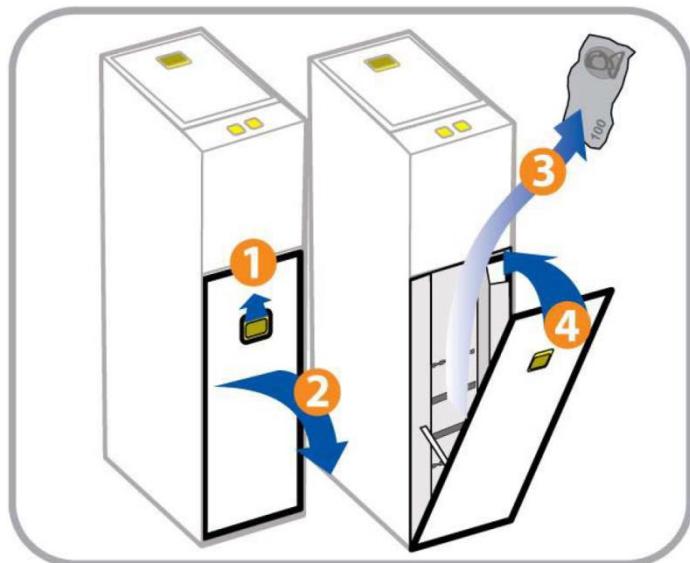
9.6.1.2 Opening Recognition sensor door "B"

To access to unit "**B**"perform the following procedure:

1. Press the yellow buttons
2. Open the door.
3. Remove the note
4. Close the door

Fig. 95

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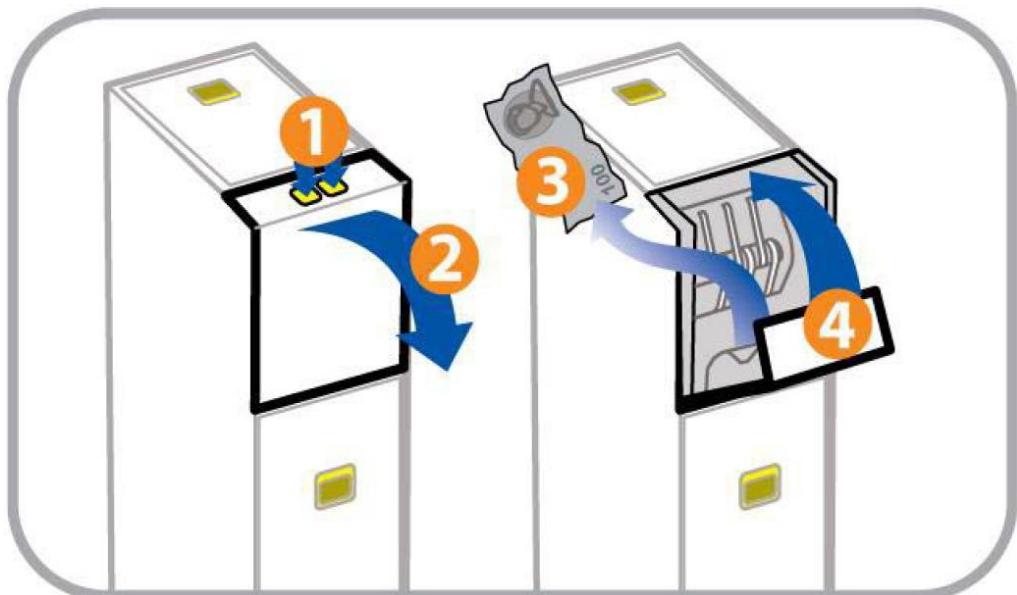
9.6.1.3 Opening Positioner door "C"

To access to unit "**C**" perform the following procedure:

1. Press the yellow button
2. Open the door
3. Remove the note
4. Close the door

Fig. 96

Fig. 97