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Chapter 1. Payout Units: Application, Types and Functional Description

The term PAYOUT UNIT refers to a mechanism used in vending machines which incorporates the necessary modules for carrying out the processes of selection, validation, and classification of coins inserted into the machine according to standard measurements and, when applicable, facilitates the change return after vending.

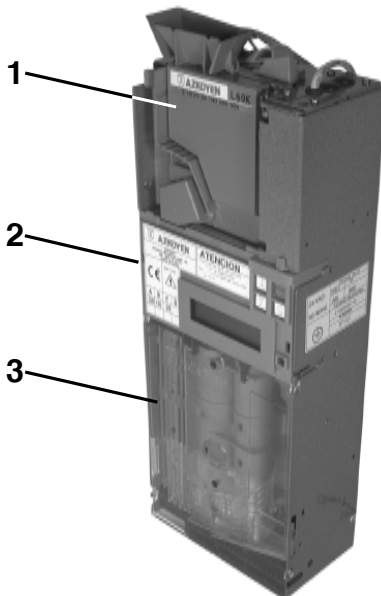
The **AN 300** series is composed of the following modules:

- AN 300 EJECUTIVO
- AN 302 / AN 304/ AN 310.
- AN 300 MDB

The **AN 400** is composed of the following modules:

- AN 400 EJECUTIVO
- AN 402 / AN 404/ AN 410.
- AN 400 MDB

Payout unit **AN 300**



Payout unit **AN 400**

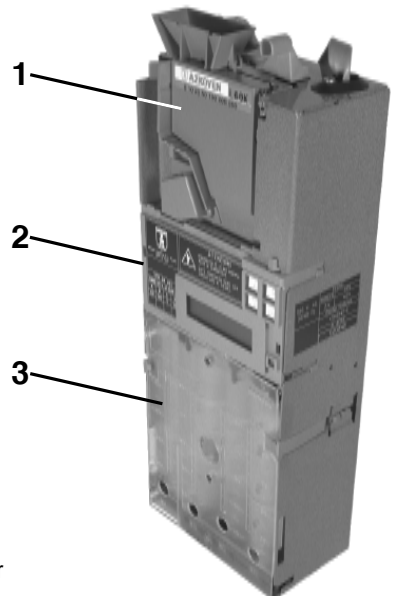


Figure 1

1. Coin selector
2. Classifier
3. Returner tubes

1.1 Payout units AN 300 and AN 400 EJECUTIVO

This unit is designed to be installed into machines that have a cerebral plaque (VMC - Vending Machine Control) controlled by a microprocessor. The payout unit has a connection bundle with the VMC that permits permanent communication between the two systems using a language known as "EJECUTIVO." All messages for correctly processing a vend are sent in this language.

An "EJECUTIVO" payout unit installed in a machine carries out validation functions – registering and classifying the coins inserted into the machine. It is the payout unit that determines whether or not a product is dispensed according to the credit accumulated.

In a machine in which a payout unit using "EJECUTIVO" language has been installed, it is the "master," i.e., the main element and its orders overrule those of the VMC. The main inconvenience of payout units using "EJECUTIVO" language communication is that any peripheral connected to the machine, e.g., a credit card reader, will depend on it and not the VMC.

1.2 Payout units AN 302 / 304 / 310 and AN 402 / 404 / 410

These payout units are designed for installation in so-called "electro-mechanical" machines, i.e., machines that either have no electronic control card or one that is not controlled by a microprocessor. These types of payout units are known as "price line" payout units. There are three models: the last number of each indicates the corresponding number of price lines. For example, if an **AN 302** or **AN 402** (two price lines) are installed in a machine, there can only be a maximum of two different prices in the machine. With an **AN 304** or **AN 404** (four price lines), there can be up to four different prices, with an **AN 310**, ten different prices and so forth.

The functions of this type of payout units, like "EJECUTIVO" language payout units, are validation, registration and classification of coins inserted into the machine. They also determine whether a vend is made or not, since the payout unit that records the amount of credit accumulated and the price of the product solicited. The payout unit even puts the machine's extractor motors into operation and is capable of "feeding" them throughout the operation.

1.3 Payout unit AN 300 and AN 400 MDB

These types of payout units, like the **AN 300** and the **AN 400**, are designed for installation in machines with a cerebral plaque (VMC – Vending Machine Control) controlled by a microprocessor.

The main difference between the **300/400** and the **300/400 MDB** is that the former uses the “EJECUTIVO” language for communicating with the VMC and the latter use the “MDB” language.

These payout units are simpler than the **300/400**, have a regulating card and a direct current electrical input provided by the machine power input.

With the MDB language, the “master” is not the payout unit but rather the electronic plaque of the machine. Any peripheral installed into the machine will be controlled by the VMC.

It can be said that the **AN 300/400 MDB**, payout unit is simply a validator, a classifier and three or four returners, all dependent upon the machine VMC.

Chapter 2. Main Characteristics

2.1 Main functions

AN 300 and AN 400 have the following main features:

- Automatic change tube filling
- The slug-proof **Azkoyen** electronic selector with anti-return system
- Payout programming using an alphanumerical LCD type display with two 16-character lines and four multifunction keys
- User-programmable permanent clock / calendar
- Complete accounting system: number and types of coin, number and type of sales, events, etc.
- Automatic self-diagnosis program

2.2 Options

Optional with the AN 300 and AN 400 series payout units:

- Direct output to a four-digit LED-type external display of optional credit or time message.
- Infrared accounting data transmission
- RS-232 communication with PCs and printers
- Direct printer communication via Centronics connection

2.3 Coin acceptance

- Accepts all currently existing coins and can accept 15 different coins with the **L60 K** coin selector and 17 different types with the **LS 6**. This selector can also accept different tokens that can be easily programmed by the payout unit owner.
- Admits coins with diameters from 17.5 to 31.5 mm
- Selection from 1.2 to 3.2 mm
- Coin acceptances may be annulled individually

2.4 Coin return

- The AN 300 series payout units are provided with 3 tube-type returners capable of returning up to 3 coins of equal or different value.
- AN 400 Series payout units have four returners, also tube-type, capable of returning four coins of equal or different values.
- Maximum return for each vend is programmable
- Returner tube capacity for 5.25 and 100 coins is:

Coin type	5	25	100
United capacity	80	68	47

2.5 Operating conditions

The operating temperature for the payout unit should be between 0° C and 55° C. The unit should be as level as possible with a maximum inclination of 5° in any direction.

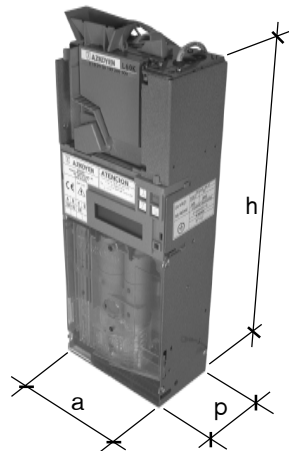
2.6 Universal application

The unit can be installed into practically any machine on the market. Input voltage may be 220 VAC, 110 VAC. or 24 VAC (by special order).

2.7 Dimensions

Payout unit dimensions are:

- Height (h) ————— 380 mm
- Width (w) ————— 137 mm
- Depth (d) ————— 80 mm



Chapter 3. Payout Unit Description

3.1 Coin selector

AN 300 and AN 400 series payout units may incorporate either L60 K or LS 6 model selectors. Both serve to validate and register coins inserted into the payout unit.

3.1.1 Dimensions of coins and admitted tokens

The admissible coin diameter and section measurements for the selector are between the following values:

- Diameter: > 17.5 and < 31.5 mm
- Section: from 1.2 to 3.2 mm

3.1.2 L60 K

Model L60 K can accept up to different 15 coins. It measures several different parameters for validation: weight, thickness, and alloy.

Its programming permits it to reject all types of false coins either lead or any other type of fraud that may be attempted. It also is provided with an "anti-return" system that impedes the extraction of a coin once it has been validated.

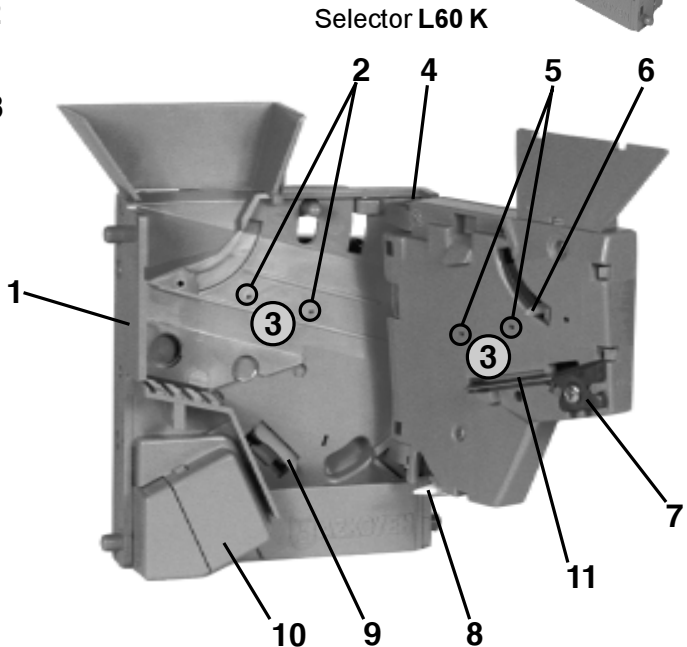
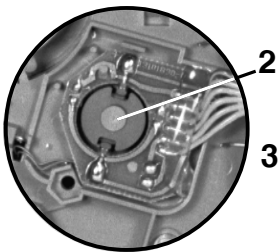
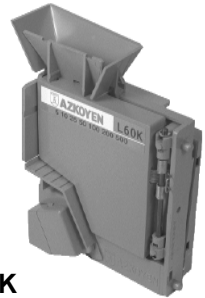
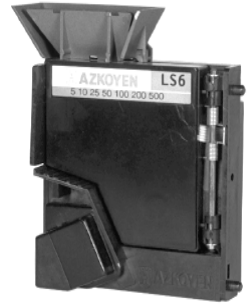


Figure 2

1. Carcass
2. Phototransistor
3. Core
4. Hinge
5. Photodiode
6. Brake flap, upper
7. Coin guide
8. Brake flap, lower
9. Anti-return
10. Obturator unit
11. Extensiometric gauge

3.1.3 LS 6

Model **LS 6** is the most advanced selector manufactured by **Azkoyen** and is currently 100% reliable. It can accept up to 17 different types of coins. It leaves the factory programmed to admit all current legal coinage and two tokens can also be easily programmed by the user. It measures the same parameters for verification as the **L60 K** model. It also has a speaker that permits it to “measure” the sound a coin makes when entering the selector. The measurement permits it to recognise and reject all currently known frauds.



Selector **L60 K**

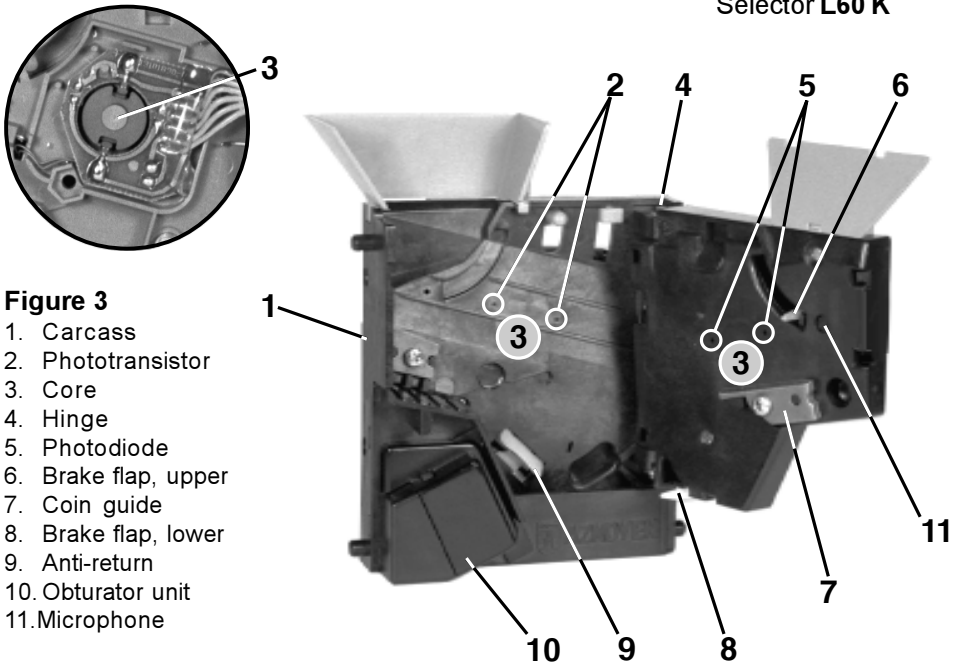


Figure 3

1. Carcass
2. Phototransistor
3. Core
4. Hinge
5. Photodiode
6. Brake flap, upper
7. Coin guide
8. Brake flap, lower
9. Anti-return
10. Obturator unit
11. Microphone

3.1.4 Coin guide and brake flaps

The coin guide (figures 2 and 3, position 7) is the first element that enters in contact with the coin.

Its function is to soften the fall of the coin and cause it to roll rather than bounce through the selector.

In the **LS 6** selector, the coin guide is of a harder material than in the **L60 K** so that the coin will produce a loud sound when entering permitting it to be adequately validated.

The upper (figures 2 and 3, position 6) and lower brake flaps (figures 2 and 3, position 8) serve to brake the velocity of the coin when entering and exiting, respectively..

3.1.5 Extensiometric gauge

This element is only found on model **L60 K**.

It functions as a precision scale and is the element that permits the selector to reject false coins made of lead. As the coin passes, it produces minute deformations in the gauge, which are detected and measured by a tiny integrated circuit joined to its lower part. These measurements are sent to the selector control card, which uses them to establish the weight of the coin.

Extensiometric gauge

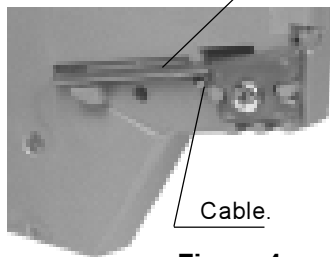


Figure 4

3.1.6 Microphone

Only found on models **LS 6** (see figure 3, position 11).

This device captures the sound produced by the coin when entering and sends this information to the selector control card where it is processed and compared to value tables recorded during manufacturing. This permits the **LS 6** to reject all known frauds on the market today.

3.1.7 Photocells

Two photodiodes are located on the hinge (figures 2 and 3, position 5) and across from them two phototransistors (figures 2 and 3, position 2) on the carcass. The photodiodes emit a small beam of infrared light, which is received by the phototransistors.

When a coin enters the selector, it interrupts this beam. The amount of time it takes to interrupt these two beams permits the selector to measure the diameter of the coin.

3.1.8 Cores

The selector has two opposing cores (figures 2 and 3, position 3): one on the hinge and another on the carcass. They consist in two small coils that create a magnetic field, which the coin disturbs as it passes. Measuring the frequency variations produced permits the selector to determine the alloy of the coin.

3.1.9 Coin anti-return

The anti-return function (figures 2 and 3, position 9) prevents a coin from being extracted once it has been validated by the selector, thus impeding frauds using coins connected to threads.

3.1.10 Obturator unit

This is the element that permits the passage of coins in a single direction, rejecting all others.

It consists of a coil that is activated to permit passage of accepted coins and remains inactive if the coin is rejected.

Coins that are validated and have exited the selector correctly will interrupt the light beam between two photocells located where they exit. Thus, the selector confirms their correct movement through the selector and transmits the value of the coin to the payout unit card.

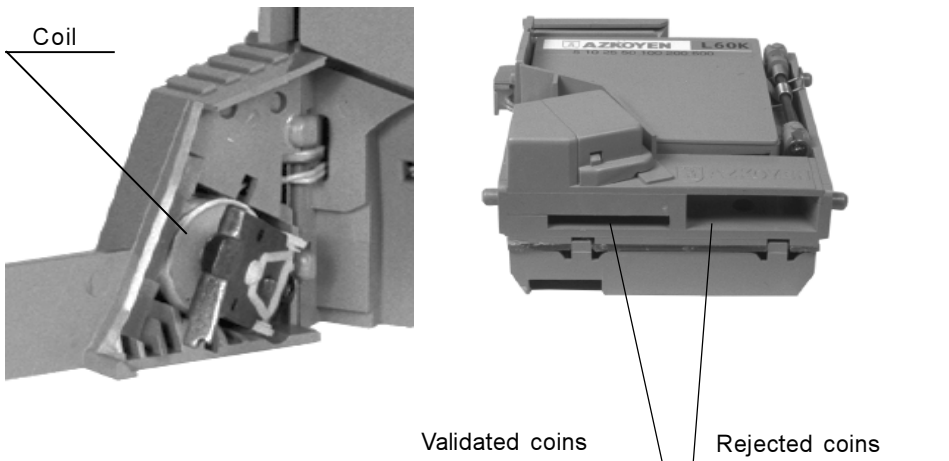


Figure 5

3.2 Classifier

This device sends the coins that have been either accepted or rejected by the selector to their corresponding destinations.

Of the different coins admissible by the payout unit, three (**AN 300**) or four (**AN 400**) are sent to the returner tube guides where they are later used for change. The rest are sent directly to the coin bin of the machine.

When a returner tube is completely full, coins of this value are also sent to the bin.

The classifier also has a fifth route permitting the direct ejection of defective or unaccepted coins or frauds.

The classification and directing of the coins is performed by electromagnets that activate knife paths.

The classifier has a button panel that permits extracting coins as well as facilitating the different programming processes available on the payout unit. The **AN 300** has de four buttons and the **AN 400** has five.

Beneath this button panel is an LCD display with two 16-character lines. This display provides visual communication facilitating unit handling by the operator. In the normal operational mode, this display indicates the credit inserted by the customer as well as the number of coins present in each of the returner tubes:

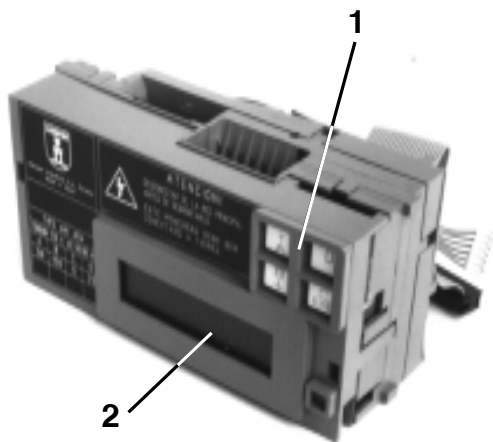
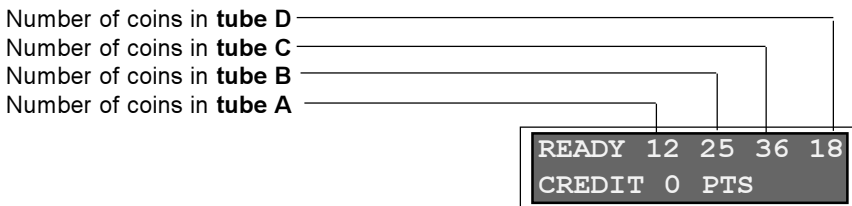
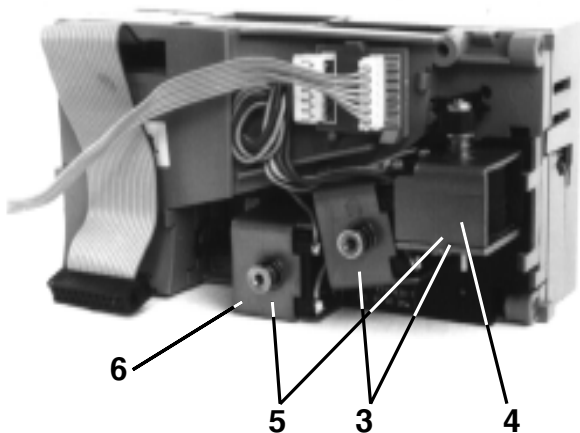


Figure 6

- 1 Keyboard
- 2 Display LCD
- 3 Classification coils (tube C)
- 4 Classification coils (tube B)
- 5 Classification coils (tube A)
- 6 Classification coils (tube D)



3.3. Returner tubes

In the three returner tubes of the **AN 300** (four in the **AN 400**) coins previously sorted by the classifier which can later be used for change are stored.

Inside the tubes are (or may be) supplementary tubes that permit adjusting the diameter of the tube for returning any type of coin. Thus, it is easy to configure the payout unit for the current legal coins used on the market or adapt it for returning coins as the owner desires.

To find out about the types of supplementary tubes and adaptation options for different types of returner coins, see "MODULE 4: COMPLEMENTS AND ACCESSORIES."

At any rate, the diameter of coins that can be returned from each of the returner tubes should be within the following parameters:

		COINS		
		From	To	
TUBE	A	17	26	m.m.
	B	20,3	30,2	
	C	17	23,2	
	D	25	32,5	

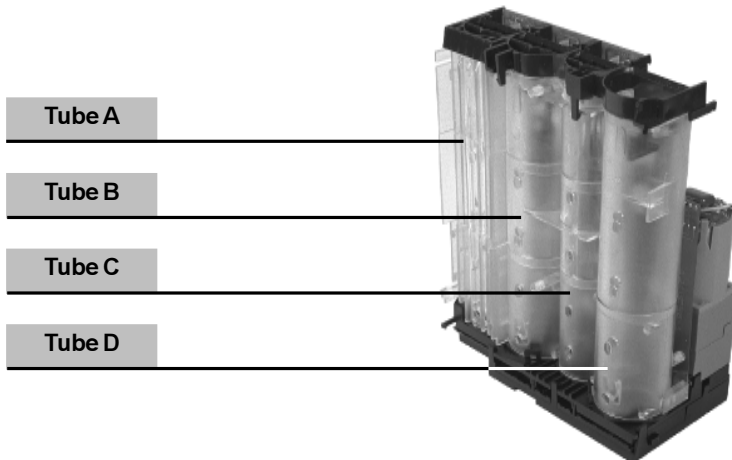


Figure 7

3.4 Coin extractor system

This device extracts change coins stored in the returner tubes.

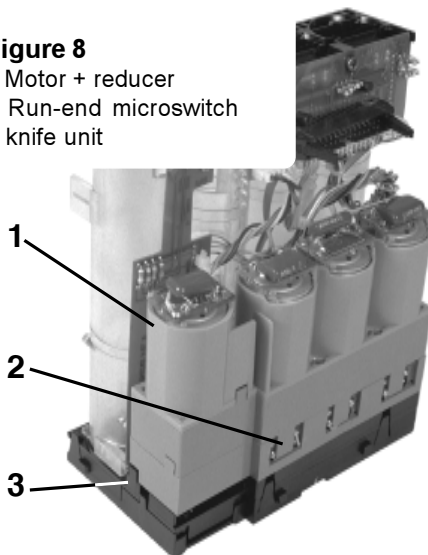
It has a motor-reducer and a knife for each returner.

Each reducer moves a knife located below the column of coins in the tube. This knife extracts the coins one by one.

The extracted coins are counted using a run-end microswitch activated by a cam each time the reducer makes a 360° turn.

Figure 8

- 1 Motor + reducer
- 2 Run-end microswitch
- 3 knife unit



3.5 U-support module and control plaque

The U-support module, as its name indicates, protects and supports the rest of the payout unit components.

The control plaque is governed by a microprocessor and is manufactured using SMD technology. It is screwed onto the U-support module and isolated from it by a sheet of plastic to avoid possible short circuits.

It is divided into two small cards in EJECUTIVO and MDB payout units and into three in the case of price line units. Thus, the manufacturing cost for each of them is small guaranteeing 100% reparation by installing a new card when one becomes damaged.

It is protected against the possible penetration of liquids into the coin entrance slot of the machine by a coat of special waxes.

This protection system is known as "tropicalisation." This avoids the uncontrolled dispensing of change or machine products by the plaque should any water, saline solution or other liquids penetrate the machine.



Figure 9