

# TECHNICAL MANUAL

**ALCOMATIC**  
**BAC/BRAC JM07**

**Alcomatic Spain S.L.**

- **FEATURES**

- High selectivity sensor
- Visual display by means of three digits of seven two-tone segments
- Dynamic display of performance indicator
- Procedures acoustic warning
- Spoken indicator for procedures and results in six languages through a voice synthesizer
- Programmable coin amount
- Programmable test result display according to country
- Programmable test result interpretation (Breath Alcohol Concentration/BRAC or Blood Alcohol Concentration/BAC)
- Inside temperature control by sensor, fan and heater
- Electronic coin counters (one historic counter and one parcial counter that can be reseted).

- **GENERAL DESCRIPTION**

The Alcomatic (Breath Alcohol Analyser) is a machine devised to tests the amount of alcohol in breath (BRAC), in a hygienic, simple, fast and precise way. It has got an ethanol-sensitive oxide semiconductor sensor. The test can be done in a very fast and simple way because the user is guided all along the process by means of visual and acoustic indicators. The machine incorporates micro switches for total performance programmability, providing a whole range of options. Test results reliability is enhanced thanks to a temperature-change stability control device. The coin acceptance control is guaranteed, with a safe database. Future software developments or changes are possible via the ISP interface integrated in the motherboard.

- **FUNCTIONAL DESCRIPTION**

- **Initial sequence. Operation test.**

On plugging in the **Alcomatic**, a general operation test is run automatically. It consists of a sequence of visual representations of all the optical elements, the sensor is checked, the coin acceptor is tested and every electronic component within is checked. It doesn't proceed to the next sequence unless this test is positive. (When the **Alcomatic** is ready you will hear a car sound.). If connecting the machine you hear a continue and prolongate sound then probably you have connected the cable of the coin mech not in the right place.

The digits of the machine can show 2 different allarms: AL5 means that there is an error on the connection of the alcohol sensor, just look at the connection and put it in the right position. AL6 means that the life of the sensor is at the end and you have to replace it for a new sensor. In this second case (AL6) please contact us to have the new sensor.

In both case when you have an allarm AL5 or AL6 the machine after few seconds put off all display lights but continue connected.

When the Machine is on, before start making tests you have to wait 15 minutes to let the alcohol sensor arrives to zero and 2 hours to let the alcohol sensor arrives to the right temperature and be equilibrated. If you start making tests before it the result of the test will not be good. SO we suggest you to respect this instructions and right times.

- **Attraction/waiting cycle**

Once the initial sequence is over, the machine comes to the attraction cycle in which it waits for a coin (s) to be inserted. During this phase, a series of visual attraction messages are displayed that represent the legal limit. Meanwhile, the machine proceeds to stabilize inside temperature.

- **Alcohol test cycle**

Once the corresponding amounts of programmed coins are inserted in the machine, it starts the analysis cycle to test the alcohol concentration in breath of the individual. This cycle starts with a countdown necessary for the correct stabilization of the sensor. In this sequence, the amber coloured digits display the countdown together with an acoustic indication that tells the individual to get ready for the test.

Once the countdown is over, the digits will display a "... "Message while the "STOP" indicator flashes intermittently and a voiced message ask the individual to blow through the blow hole. Meanwhile, the "BLOW" indicator will flash intermittently. The machine remains in this phase till it detects that the individual is breathing out; at that moment the temperature control procedures come to an end and the "BLOW" indicator stops flashing. If, after 10 seconds the machine detects that the individual has not breathed out, the cycle will conclude and the test will finish.

When the individual starts breathing out the machine proceeds to analyse the breath for 3 – 5 seconds. After that, the "BLOW" indicator will be switched off so as to indicate the individual to stop breathing out. Then the digits will display the amount of alcohol in breath: they will appear in green if the result is under the set legal limit or in red if it is over the limit. At the same time, a spoken message will tell the individual if s/he is under or over the legal limit. It goes on for 5 sec to allow the individual to assimilate the information and to allow the sensor stabilization. After that, the test cycle will come to a conclusion.

## • HOW TO CALIBRATE THE ALCOMATIC

It's factory tested and pre-calibrated however, due to the air pressure and other ambiental parameters, calibration may vary, thus altering the sensor sensing ability. For best results, plug in the **Alcomatic** and let it run for at least 48 hour. Then follow carefully the instructions to programme and calibrate the machine.

### 1. - Previous steps: solution and BAC simulator

A testing solution must be prepared so as to effect a perfect calibration of the **Alcometrix**, together with the simulator. The solution can be good for 2 months, as long as you keep the container tightly closed and stored in a place where the temperature is equal or under 20°C. The solution can go bad if the temperature exceeds 26°C for a period of 7 to 14 days; if you are not sure, make a new solution.

#### 1.1. *How to prepare the testing solution for the simulator*

##### ➤ Materials needed:

- ❑ A 5- litres clean container.
- ❑ A graduated test tube (which measures 15 ml).
- ❑ 3,785 litres of water.
- ❑ 15 ml of any alcoholic drink with 37,5 % vol.

##### ➤ Instructions to prepare the solution

- ❑ Fill the 5- litres container with the 3,785 litres of water.
- ❑ Pour 15 ml. of the alcoholic drink into the container.
- ❑ Shake the mixture for at least 3 min.

#### 1.2. *How to prepare the simulator:*

- ❑ Pour enough of the solution into the simulator so that it is filled 60%
- ❑ Make sure the thermometer is at least 2 cm dipped into the solution
- ❑ Keep an eye on the temperature of the solution; it must be 34°C

- ❑ If the temperature is lower, place the simulator under running hot water or just use a hair dryer.
- ❑ If the temperature is higher, place the simulator under cold water or ice it down.

## 2. How to set up operating conditions

To set up the operating conditions, first plug off the machine, and then proceed as follows.

### 2.1. Operating options:

- Proceed to adjust the following options by means of the indicated switches and according to the following tables:

- ❑ Switches SW4 to SW1: **LANGUAGE/S SELECTION:**

You can select the language(s) the **Alcomatic** will speak during its operation by means of these micro switches. By combining languages, the same message will be repeated in the two languages one after the other. There are different versions of voice chip languages, please look at the sticker of your voice chip and select the one of the following tables:

SW4	SW3	SW2	SW1	LANGUAGE(S) V1.0
ON	ON	ON	ON	SPANISH
ON	ON	ON	OFF	ITALIAN
ON	ON	OFF	ON	PORTUGUESE
ON	ON	OFF	OFF	CATALAN
ON	OFF	ON	ON	GERMAN
ON	OFF	ON	OFF	ENGLISH
ON	OFF	OFF	ON	SPANISH+ENGLISH
ON	OFF	OFF	OFF	SPANISH+GERMAN
OFF	ON	ON	ON	SPANISH+PORTUGUESE
OFF	ON	ON	OFF	ITALIAN+ENGLISH
OFF	ON	OFF	ON	ITALIAN+GERMAN
OFF	ON	OFF	OFF	PORTUGUESE+SPANISH
OFF	OFF	ON	ON	PORTUGUESE+ENGLISH
OFF	OFF	ON	OFF	CATALAN+SPANISH
OFF	OFF	OFF	ON	GERMAN+ENGLISH
OFF	OFF	OFF	OFF	VOICELESS

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<b>SW4</b>	<b>SW3</b>	<b>SW2</b>	<b>SW1</b>	<b>LANGUAGE(S) V2.0</b>
ON	ON	ON	ON	CHINESE
ON	ON	ON	OFF	SUOMI
ON	ON	OFF	ON	GREEK
ON	ON	OFF	OFF	NOTHING
ON	OFF	ON	ON	FRENCH
ON	OFF	ON	OFF	ENGLISH
ON	OFF	OFF	ON	CHINESE+ENGLISH
ON	OFF	OFF	OFF	CHINESE+FRENCH
OFF	ON	ON	ON	CHINESE+NOTHING
OFF	ON	ON	OFF	SUOMI+ENGLISH
OFF	ON	OFF	ON	SUOMI+FRENCH
OFF	ON	OFF	OFF	GREEK + CHINESE
OFF	OFF	ON	ON	GRIEGO + INGLES
OFF	OFF	ON	OFF	NOTHING
OFF	OFF	OFF	ON	FRENCH+ENGLISH
OFF	OFF	OFF	OFF	SIN VOZ

<b>SW4</b>	<b>SW3</b>	<b>SW2</b>	<b>SW1</b>	<b>LANGUAGE(S) V3.0</b>
ON	ON	ON	ON	SPANISH
ON	ON	ON	OFF	ITALIAN
ON	ON	OFF	ON	HOLAND
ON	ON	OFF	OFF	CATALAN
ON	OFF	ON	ON	GERMAN
ON	OFF	ON	OFF	ENGLISH
ON	OFF	OFF	ON	SPANISH+ENGLISH
ON	OFF	OFF	OFF	SPANISH+GERMAN
OFF	ON	ON	ON	SPANISH+HOLAND
OFF	ON	ON	OFF	ITALIAN+ENGLISH
OFF	ON	OFF	ON	ITALIAN+GERMAN
OFF	ON	OFF	OFF	HOLAND +SPANISH
OFF	OFF	ON	ON	HOLANDES +ENGLISH
OFF	OFF	ON	OFF	CATALAN +SPANISH
OFF	OFF	OFF	ON	GERMAN+ENGLISH
OFF	OFF	OFF	OFF	SIN VOZ

SW4	SW3	SW2	SW1	LANGUAGE(S) V4.0
ON	ON	ON	ON	SPANISH
ON	ON	ON	OFF	ITALIAN
ON	ON	OFF	ON	PORTUGUES
ON	ON	OFF	OFF	EUSKERA
ON	OFF	ON	ON	GERMAN
ON	OFF	ON	OFF	ENGLISH
ON	OFF	OFF	ON	SPANISH+ENGLISH
ON	OFF	OFF	OFF	SPANISH+GERMAN
OFF	ON	ON	ON	SPANISH+PORTUGUES
OFF	ON	ON	OFF	ITALIAN+ENGLISH
OFF	ON	OFF	ON	ITALIAN+GERMAN
OFF	ON	OFF	OFF	PORTUGUES + SPANISH
OFF	OFF	ON	ON	PORTUGUES + ENGLISH
OFF	OFF	ON	OFF	EUSKERA + SPANISH
OFF	OFF	OFF	ON	GERMAN+ENGLISH
OFF	OFF	OFF	OFF	SIN VOZ

□ Switches SW7, SW8: **NUMBER OF COINS/TEST SELECTION**

The **Alcometrix** operates with the insertion of 1 to 4 coins. It is selected by means of these two switches:

SW7	SW8	N° COINS/TEST
ON	ON	1
OFF	ON	2
ON	OFF	3
OFF	OFF	4

□ Switches SW5, SW6: **TYPE OF ANALYSIS AND DISPLAY**

These two switches indicate the machine the way it has to display the analysis result. If you select the BAC option, you'll be able to choose two different formats to display results. But, if you select the BRAC option, then the display can only have one format, because BRAC measuring is expressed in mgrs/l but not in percentages.



SW5	SW6	TYPE OF ANALYSIS AND DISPLAY
ON	ON	BAC (alcohol concentration in blood) X.XX gr./l
ON	OFF	AMERICAN BAC (alcohol concentration in blood) _.XX gr./100ml
OFF	ON/OFF	BRAC (concentration de alcohol en aliento) X.XX mg/l

## 2.2. How to establish the legal drink driving limit

- The board has got 3 push buttons set into its top side. To select the legal limit proceed as follows:

With the machine on and in the attraction phase, keep the left button pressed till the digits display “Lit” in red. Then release the button and the machine will start the limit setting procedure. Bear in mind that the machine will operate automatically within the limit associated to the type of analysis selected with switches 5 and 6, which you can establish according to the following table:

Switches position		Type of analysis	Display	Programming range
SW5	SW6			
ON	ON	BAC	X.XX gr/l	0.00 a 4.00
ON	OFF	American BAC	_.XX gr/100ml	_.00 a _40
OFF	ON/OFF	BRAC	X.XX mg/l	0.00 a 2.00

To put down or up the limit please use the central button and the left button, then when you have decided your limit confirm it pushing the right button for few seconds.

## 3. Alcomatic calibration.

- ❑ **Switch SW9: sensor calibration**
- ❑ **ATTENTION: Calibration must be in BRAC ( SW5 OFF, SW6 ON/OFF)**
- ❑ **During the calibration, the machine will let you blow every 30 seconds.**
- ❑ **At the end of calibration establish the type of Analysis (2.2)**

Once the previous procedures have been successfully achieved and after a running period of at least 48 hours, the machine starts the

sensor calibration process by means of switch SW9. We recommend at least a calibration every 3 months.

- ❑ 1. -Take the simulator and check that the temperature of the mixture is 34°C.
- ❑ 2. – Before start calibration please blow 2 or 3 times into the simulator coupling it into the machine to shake the mixture and see the result on the digits.
- ❑ 3. -. Check that the **Alcomatic** is in the attraction cycle.
- ❑ 4. -Switch the SW9 on and the digits will display CAL.
- ❑ 5. – look that SW5 is in OFF position (BRAC MODE).
- ❑ 6. -Wait till the **Alcomatic** comes to an alcohol test cycle.
- ❑ 7. -Wait till the countdown finishes and the machine tells you to blow.
- ❑ 8. -Blow through the simulator in a constant way.
- ❑ 9. -Look at the result displayed by the digits. There are two possible options from this point onwards:
  - a) The **Alcomatic** detects that the sensor is calibrated.  
The digits appear in green and display a figure between 0.33 and 0.39. Wait till the message END is displayed. Then put the SW9 off and the calibration process is over.
  - b) The **Alcomatic** detects the sensor is not calibrated.  
The digits appear in red. The **Alcomatic** starts a new alcohol test cycle. If the result is higher than 0.39, turn the calibration screw set on the left of the sensor anticlockwise. If it is lower than 0.33 turn it clockwise. It's advisable to turn the screw just ¼ hour or ½ hour at a time.
- ❑ 10.- Repeat this procedure starting from point 7 till you get the results in point 9a.

SW9	Calibrate
ON	YES
OFF	NO

**AFTER THAT CALIBRATION IS DONE DON'T FORGET TO SELECT YOUR TYPE OF ANALYSIS USING SWITCHES: SW5 AND SW6.**

#### **4. How to display and/or set to zero the USER coin counter (UC).**

- The machine includes an electronic coin counter with a maximum capacity of 999.999 coins. Every time a valid coin is inserted into the coin acceptor, the counter adds a unit. Its content can be visually displayed or set to zero. To display and/or set it to zero proceed as follows:

With the machine on and in the attraction cycle keep the right button pressed till the digits display “UC” in red. Then release the button and the machine starts the visual display procedure. Alternatively, the 3 more significant figures of the counter and the 3 less significant ones are displayed. When the more significant figures are displayed, the decimal point of the unit digit flashes. For example: if you see 001. and 324, it means the counter value is of 001.324 coins.

To set it to zero, if SW1 is in ON position put it in OFF, and if your SW1 is in OFF position than put it in ON, and then at the end put switch on an other time in the old position.

To exit, keep the right button pressed. (If it's not set to zero, the counter will record the amount).

## **5. How to display the HISTORIC USER coin counter (HC).**

- The machine includes an electronic coin counter with a maximum capacity of 999.999 coins. Every time a valid coin is inserted into the coin acceptor, the counter adds a unit. Its content can be visually displayed but it can't set to zero.

To display and/or set it to zero proceed as follows:

With the machine on and in the attraction cycle keep the central button pressed till the digits display “HC” in red. Then release the button and the machine starts the visual display procedure. Alternatively, the 3 more significant figures of the counter and the 3 less significant ones are displayed. When the more significant figures are displayed, the decimal point of the unit digit flashes. For example: if you see 001. and 324, it means the counter value is of 001.324 coins.

To exit, keep the right button pressed. (The counter will save always the amount).

## **6. How to adjust the volume**

The volume control is on the up – right side of the board. To turn it up, turn it anticlockwise, and to turn it down, turn it clockwise. Try not to alter the position of the tubes when doing this operation.