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Alkotest

Alcohol contents volume percentage analyzer

USER'S GUIDE

CONTENTS:

KEY FEATURES

FIELD OF APPLICATION

Alkotest series Analyzers are intended for measurement of the ethyl alcohol contents in wine distillate and water alcohol mixtures. Using this analyzer the time needed per one analysis is reduced to about 2 minutes (assuming distillation is already done). Alkotest analyzer makes unnecessary the use of such equipment as Analytical Balances, precision water thermostat and picnometers in the process of alcohol contents measurement. It also significantly reduces the human factor influence in the measurement process. Alkotest Analyzers are easy for use and serve. There is no need of specialized glass equipment and qualified personal. The user can easily calibrate the equipment by means of calibrating solutions (standards). It is recommended to check the equipment twice a month and to calibrate it if necessary. The calibration is made in four points for each of the measurement ranges: For **Range 1** - distillated water (0% alcohol contents), and three standard solutions with accurately determined alcohol contents – one standard solution is required for each one of the ranges 9.00±0.3%, 11.5±0.3% and 14.00±0.3%. For **Range 2** calibration one standard solution is required for each one of the ranges 35.00±0.3%, 40.00±0.3%, 45.00±0.3% and 50.00±0.3%.

The Analyzer accuracy is ±0.1% volume alcohol contents, in the range from 0% to 15% and from 35% to 50%. The analysis accuracy can be controlled by means of standard alcohol samples, standard wine samples, checking samples and other methods.

KEY FEATURES:

- Portable and lightweight design;
- Cost effective:
  - Low power consumption;
  - Small sample volume – less than 25 cm^3 ;
- Complete User calibration by means of standard solutions;
- RS232 Interface;
- ESC/POS printer support.

MEASUREMENT SPECIFICATION:

Ethyl Alcohol measurement range-	from 0 to 15.00 % and from 35.00 to 50. 00% by volume
Resolution -	0,01%;
Repeatability -	±0,04%
Accuracy (absolute) -	±0,1%
Volatile Acid content in the sample no more than	1 g/l;
Time per one measurement (no more than)	90 sec.

POWER SUPPLY:

Mains Voltage	220V/ AC +10/-15% 50/60Hz; (110V/AC Optional)
Cat Battery	12V DC (10.6 to 14.2V);
Power Consumption (no more than)	30W;

ENVIRONMENTAL:

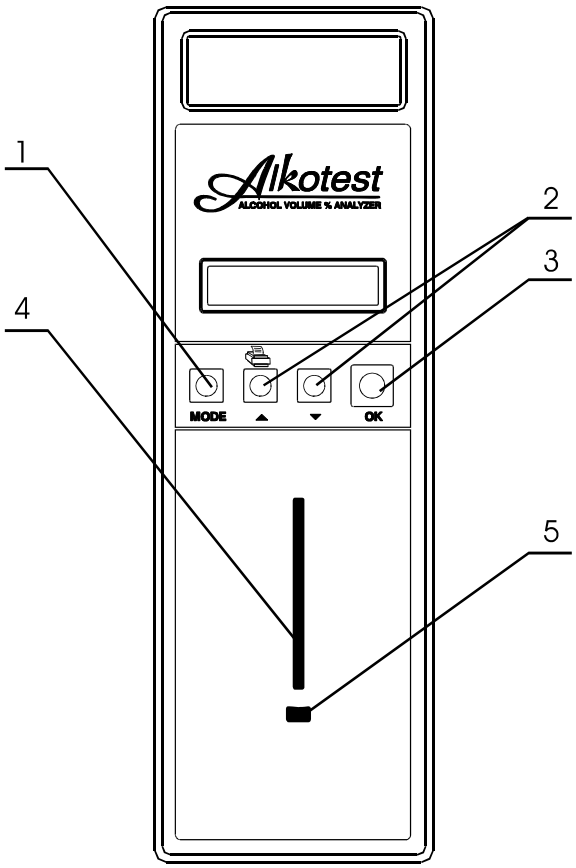
Air Temperature	from 15 to 30 C°
Relative Humidity	from 30 to 80%
Sample Temperature	from 15 to 25 C°

ADDITIONAL FEATURES:

RS232 Computer interface available;
Serial (ESC/POS) printer output available;

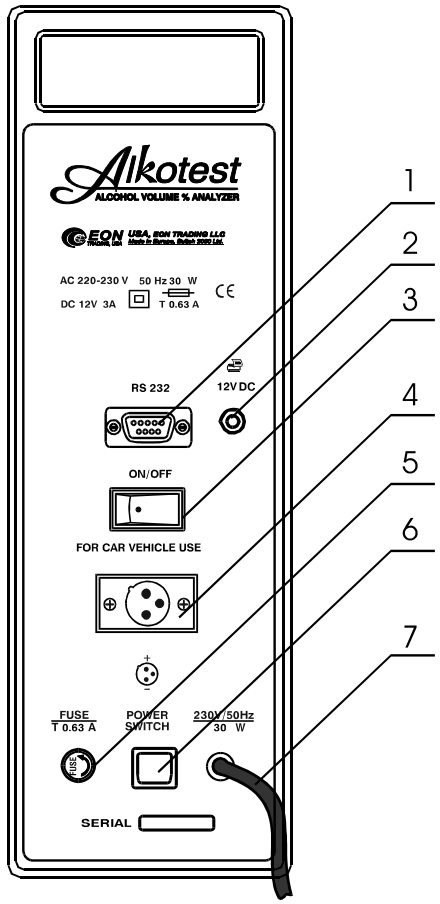
Size (HxWxD) -	300x95x250 mm;
Weight (no more than) -	4 kg

ALKOTEST FRONT AND BACK PANELS



Front Panel

1. MODE/MENU Button
2. Mode select buttons
3. OK button
4. Sample sucking nozzle
5. Measuring mug plastic support



Back Panel

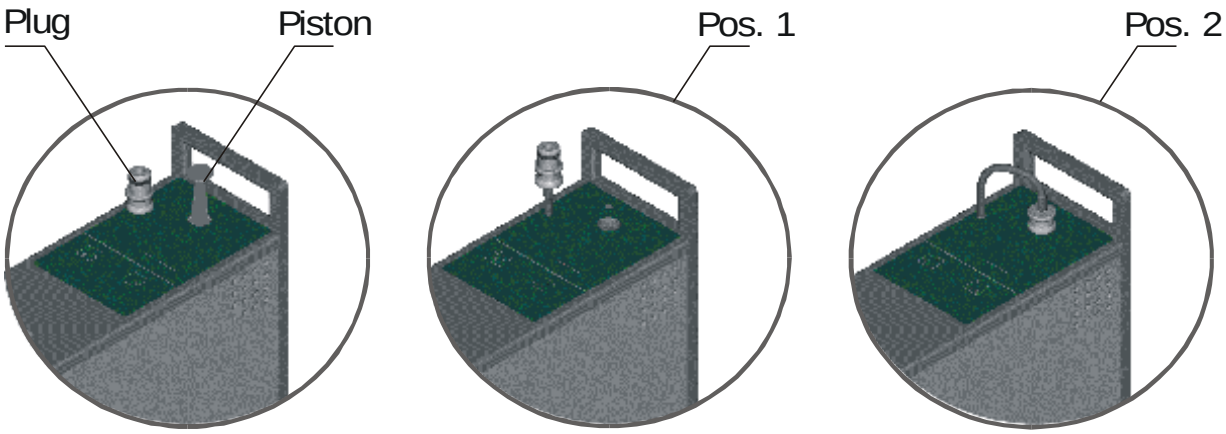
1. RS 232 Connector
2. 12V DC power supply for external printer
3. 12V car battery power supply switch
4. 12V car battery power supply connector
5. Fuse 220V/ 0,63A (110V/1.0A)
6. 110/220V AC power supply switch
7. Power supply cable

ALKOTEST ANALYZER KIT

Pos.	Description	Quantity.
1.	Alkotest Analyzer	1
2.	Standard solutions for calibration – 100ml each	1 set
3.	User's Guide	1
4.	12V power supply cable	1
5.	Measuring mug	2

ANALYZER INSTALATION

Before to use the Analyzer for the first time please, take the syringe piston out of the syringe (pos. 1) and insert the plastic plug with rubber O-rings instead (pos. 2).



Place the Analyzer vertically on a table or another flat surface and connect it to the power supply:

- AC power supply voltage

Connect the AC power supply plug to the mains socket and set the AC power supply switch to ON;

- 12V DC power supply voltage

Plug the 12V cable connector into the matching back panel 12V power supply connector and connect the other end of the cable to an autonomous DC supply (car battery). Set the 12V Power switch to "ON".)

Warm up

As soon as the power is on, a **WARM UP** message appears on the display. When the "warm up" stage is over in about 5 minutes, **ALKOTEST** is shown on the display. The Analyzer is ready to use. It is recommended one or two dummy tests to be done as a part of the initial warm up procedure (just leave these test results out of consideration).

Warning: The covers of the Analyzer should never be removed while the power leads are connected.

Warning: Under no circumstance you should try to repair the Analyzer's power lead yourself. In case of power lead damage, contact your dealer to make the repairs.

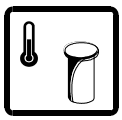
MODES OF OPERATION

As soon as the **MODE** button is pressed the two main modes of operation will appear on the LCD - **MEASUREMENT** and **CALIBRATION**. The desired mode of operation should be selected first using one of the arrow buttons ▼, ▲ and then it can be started by pressing the **OK** button. After the initial warm up procedure the **MEASUREMENT** mode is selected by default.

When in MEASUREMENT mode the instrument automatically recognizes the proper range for the tested sample and there is no need the operator to choose the range manualy.

Using ▲ and ▼ buttons you can also select one of the following modes:

- "Settings" - this mode allows you to set the Time and Date of the Instrument's real time clock;
- "Cleaning" – this mode is used to clean the sensor of the Analyzer at the end of a working day or when it is necessary (see the CLEANING OUT chapter).



SAMPLE PREPARATION

ALKOTEST ultrasonic analyzers can measure the volume percentage alcohol contents in water – alcohol mixtures or wine distillates. In case wine distillate is to be measured the wine should be alkalized before the distillation in order to remove the volatile acids from it. If this is not done the measurement result may deviate from the real distillate alcohol value. The sample temperature should be in the range from 15 to 25 C°.

If the sample to be measured is left calm for a while an alcohol contents gradient begins to take place – the alcohol contents at the top of the vessel becomes higher than at the bottom. This is why it is strongly recommended you carefully to mix the sample before you start the measurement.

MEASUREMENT

Select **MEASUREMENT** mode and press the **OK** button. A "**Load Sample For Cleaning**" message appears on the LCD. Now put in the measuring mug about 20 – 25ml of the tested sample. Place the measuring mug on the front panel plastic support with the sucking nozzle into the sample.

Press the **OK** button again. A "**Cleaning…**" message appears on the LCD and the Analyzer sucks and returns back twice part of the sample. Then a "**Load Sample For Measuring**" message appears on the LCD. Now replace the liquid in the measuring mug with new taken from the same sample and place again the measuring mug on the front panel plastic support with the sucking nozzle into the sample. Press the **OK** button. The Analyzer sucks part of the sample and "**Measuring Mode Working**" message appears on the LCD. The measurement takes about 90 seconds and the measurement steps are indicated on the Analyzer's LCD with black squares.

After the measurement completes the sample is returned back to the measuring mug and **"Alcohol: XX.XX%"** message appears on the LCD (XX.XX% represents the alcohol volume contents measured). The measurement result is sent trough the RS232 interface as well.

*If a "**Sample Out Of Range**" message appears on the LCD after the measurement completion, it means the sample alcohol contents is beyond the limits of both specified ranges and can not be measured accurately.*

As soon as a measurement completes and result is saved next sample measurement can be started. The Analyzer is designed for continuous work as long as needed.

PRINTIG OUT THE MEASUREMENT RESULTS (REQUIRES EXTERNAL ESC/POS PRINTER)

The measurement result shown on the Analyzer's LCD can be printed out on an external serial ESC/POS printer connected to the back panel RS232 connector of the Analyzer. In order to do this please press the ▲ button first. A message "Number: 000" appears on the Analyzer's LCD. Using the ▲ and ▼ buttons you can set the current sample number between 001 and 999 - ▼ button allows you to select the digit to be modified, while each pressing of the ▲ button increments the value of the selected digit. When the sample number is set press the OK button for printing out. In case you do not need to set sample number just press the OK button with 000 as a sample number. If you need a second copy of the receipt please press the ▲ button after the first copy is printed out. The second copy will be printed immediately and you will not need to enter the sample number again.

CLEANING OUT

When all measurements are done the Analyzer's sensor should be cleaned before the Analyzer is turned off. In order to clean the sensor fill measuring mug with distilled water and place it on the front panel plastic support with the sucking nozzle into the water. Select "Cleaning" mode from the main menu and press the OK button. When the cleaning is done replace the used water with fresh and repeat the above procedure 2 – 3 times.

CALIBRATION

All **ALKOTEST** ultrasonic analyzers are factory calibrated for ethyl alcohol volume percentage contents measurement in water alcohol mixtures and wine distillates. The specified accuracy of the Analyzer is ±0.1% of alcohol contents in the range from 0.00% to 15.00% and from 35,00% to 50.00% alcohol. The analysis accuracy can be controlled by means of standard alcohol samples, standard wine samples, checking samples and other methods. It is recommended **ALKOTEST** Analyzers to be checked once per two weeks and to be calibrated if necessary (in case an Analyzer does not meet the accuracy spec).

Preparing for Calibration

Place the Analyzer vertically on a table or another flat surface and connect it to the power supply. Turn On the Analyzer's power supply switch. A "**Warm Up …**" message appears on the LCD. After the initial warm up procedure completes in about 4 – 5 minutes an "**A L K O T E S T**" message appears on the LCD which means the Analyzer is ready. Please, make two dummy measurements as a part of the initial warm up procedure (just leave this test results out of consideration). This is made in order to put the ultrasonic sensor in optimal temperature mode for best calibration results. It is recommended samples with alcohol contents close to the one of the first calibration solution to be used for these dummy measurements.

The Range 1 calibration procedure requires you to have distilled water and three calibration standards – at least 50ml of each. For Range 1 you should have one calibration standard with alcohol contents in each of the following ranges: 9.00±0.3%, 11.5±0.3%, 14.00±0.3%. The Range 2 calibration procedure requires four calibration standards – one for each of the ranges 35,00±0,3%, 40,00±0,3%, 45,00±0,3% and 50,00±0,3%.

Range 1 Calibration

Enter the main menu by pressing the **MODE** button and then select "**Calibration**" mode using the arrow buttons ▼ , ▲ . Press the **OK** button and "**Range 1, Range 2**" message appears on the LCD. Using the arrow buttons ▼ , ▲ select Range 1. Press the **OK** button again and a "**Load Water For Cleaning**" message will appear on the LCD. Now put about 20ml distilled water in the measuring mug. Place the measuring mug on the front panel plastic support with the sucking nozzle into the sample.

Press the **OK** button again. A "**Cleaning…**" message appears on the LCD and the Analyzer sucks and returns back twice part of the sample. Then a "**Load Water For Calibration**" message appears on the LCD. Now replace the water in the measuring mug with new and place again the measuring mug on the front panel plastic support with the sucking nozzle into the sample. Press the **OK** button. The Analyzer sucks part of the sample and "**Calibration Mode Working**" message appears on the LCD. The calibration takes about 90 seconds and the calibration steps are indicated on the Analyzer's LCD with black squares.

At the completion of this calibration step the Analyzer automatically returns the used water sample and "**Enter Value Alc 1 00.00 %**" message appears on the LCD. Now using the ▼ , ▲ buttons you have to enter the volume percentage alcohol contents of the first calibration standard – the one whose alcohol contents is in the range 9.00±0.3%. Using the ▼ button you can move the cursor trough the alcohol value digits (the alcohol value is set as 00.00% initially) while using the ▲ button you can dial the proper value of the selected digit. Every time you press the ▲ button the selected digit value is incremented. Please, be aware by pressing ▲ button you can roll over the digit value from 9 to 0.

Example: Let's assume the calibration standard used has alcohol contents of 9,13%. In order to enter this value you should press ▼ , ▲ buttons in the following sequence after the "**Enter Value Alc 1 00.00 %**" message appears on the LCD:

- Press ▼ button once;
- Press ▲ button 9 times;
- Press ▼ button once;
- Press ▲ button once;
- Press ▼ button once;

- Press ▲ button 3 times.

Now it should be shown "**Enter Value Alc 1 09.13 %**" on the LCD.

Press the **OK** button after the calibration standard alcohol contents is correctly dialed. "**Load Sample 1 For Cleaning**" message appears on the LCD. Now put about 20ml of this calibration standard in the measuring mug. Place the measuring mug on the front panel plastic support with the sucking nozzle into the sample and press the **OK** button. "**Cleaning…**" message appears on the LCD and the Analyzer sucks and returns back twice part of the sample. "**Load Sample 1 For Calibration**" message appears then. Now throw away the used sample, fill the measuring mug with sample from the same calibration standard and place again the measuring mug on the front panel plastic support with the sucking nozzle into the sample. Press the **OK** button. The Analyzer sucks part of the sample and "**Calibration Mode Working**" message appears on the LCD. The calibration stage takes about 90 seconds and the calibration steps are indicated on the Analyzer's LCD with black squares.

At the completion of this calibration stage the Analyzer automatically returns the used sample and "**Enter Value Alc 2 00.00 %**" message appears on the LCD. Now following the same steps as described above you have to enter the alcohol volume contents of the second calibration standard – the one with alcohol contents in the range 11,5±0.3%. Clean and calibrate the Analyzer with this calibration standard in the same way as it has been done with the first standard. At the completion of this calibration stage the Analyzer automatically returns the used sample and "**Enter Value Alc 3 00.00 %**" message appears. Following again the steps described above you have to enter the alcohol volume contents of the third calibration standard – the one with alcohol contents in the range 14.00±0.3%. Clean and calibrate the Analyzer with this calibration standard in the same way as it has been done with the first standard. At the completion of this calibration stage the Analyzer automatically returns the used sample and "**Calibr. Finished**" message appears on the LCD. This means the calibration procedure has completed successfully and you just need to press the **OK** button in order to start a sample measurement.

Range 2 Calibration:

Enter the main menu by pressing the **MODE** button and then select "**Calibration**" mode using the arrow buttons ▼ , ▲ . Press the **OK** button and "**Range 1, Range 2**" message appears on the LCD. Using the arrow buttons ▼ , ▲ select Range 2.

Now you can proceed with the calibration of Range 2 in a way similar to the calibration of Range 1: Dial first the alcohol contents value of the first calibrating standard – the one with alcohol contents in the range 35,00±0,3%, clean the Analyzer using sample of this standard and run calibration then. Repeat the same procedure using calibrating standards with alcohol contents 40,00±0,3%, 45,00±0,3% and 50,00±0,3%. Now the Range 2 calibration is done.

In order an accurate calibration to be done it is important the calibration standards alcohol contents to be in the desired ranges: 9,0±0,3%, 11,5±0,3% и 14,0±0,3% for Range 1 and 35,00±0,3%, 40,00±0,3% , 45,00±0,3% and 50,00±0,3% for Range 2.

In case the alcohol contents of any of the calibration standards is out of the required range "**Improper value , MODE-Back OK Fwd**" message appears. In case you want to continue the calibration using this value press the **OK** button. If you need to enter a new alcohol contents value for this calibration standard (if the alcohol content has been dialed wrongly for example) please press the **MODE.** This will let you dial again the alcohol contents of the same standard.

WARNING: ***Using calibration standards with alcohol contents out of the required ranges, using the calibration standards in a sequence different from the required (distilled water, standard 1 – 9.00±0.3%, standard 2 – 11.50±0.3% and standard 3 – 14.00±0.3% for Range 1 and standard 1 – 35.00±0.3%, standard 2 - 40,00±0,3%, standard 3 - 45,00±0,3% and standard 4 - 50,00±0,3% for Range 2)) or entering wrong alcohol contents value of the calibration standards may cause improper calibration and you'll need to calibrate again the Analyzer.***

Cleaning

If the Analyzer will be no longer used after the calibration is done it should be cleaned before you turn it Off as described in chapter **CLEANING OUT**.

SETTINGS

In order to set the current time and date please select “Settings” mode from the main menu and press the OK button. A “Time & Date” message appears on the Analyzer’s LCD. Press the OK button again. The current time appears on the Analyzer’s LCD – **Time: HH:MM:SS** (**HH** – hour, **MM** – minutes, **SS** – seconds). Now using the ▼ button you can select the digit to be modified while every time you press the ▲ button the selected digit value is incremented. When the time is set press the OK button. The current date appears on the Analyzer’s LCD – **Date: DD:MM:YY (DD** – the day of the month, **MM** – month, **YY** – the last two digits of the year). Using ▲ and ▼ buttons set the date in a similar way as Time has been set and press the OK button. This way the Time and Date setting is done and “Time Set OK” message appears on the Analyzer’s LCD. Now you can press the MODE button in order to select another mode of operation.

ERROR MESSAGES

ERROR	ASSEMBLY	PROBLEMS & CAUSES	REMEDY
1. MOTOR ERROR	Pump Motor	Pump Motor does not respond	Turn Off the power supply, then turn it On in 10 seconds and try again to start a measurement.
2. EMPTY CAMERA	Measurment system	There is not enough sample liquid in the measuring mug	Put enough sample liquid..
3. HOT SAMPLE	Measurment system	The sample temperature is too high.	Cool down the sample and try again.
4. IMPROPER VALUE	Measurment system calibration	The calibration standard alcohol contents is out of the required range.	Enter the proper alcohol contents.
5. Out of range	Tested Sample	The alcohol contents of the tested sample is out of the Analyzer’s specified ranges	The alcohol contents of the tested samples should be between 0 and 15% or between 35 and 50%

GUARANTEE

Guarantee period is one year after purchasing date.

Guarantee is void if warranty labels are removed. Improper handling, transport and storage will invalidate the guarantee. Under no circumstance you should try to repair the Analyzer yourself, as this will invalidate the guarantee. The guarantee conditions for this analyzer are as defined by our representative in the country of sale.

Serial N:

Date: