



Dräger Alcotest[®] 5510 Breath Alcohol Monitor Instructions for Use



WARNING

Strictly follow the Instructions for Use. The user must fully understand and strictly observe the instructions. Use the product only for the purposes specified in the Intended use section of this document.



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1 For your safety

1.1 General safety notes

- Before using this product, carefully read the Instructions for Use.
- Strictly follow the Instructions for Use. The user must fully understand and strictly observe the instructions. Use the product only for the purposes specified in the Intended use section of this document.
- Do not dispose of the Instructions for Use. Ensure that they are retained and appropriately used by the product user.
- Only trained and competent users are permitted to use this product.
- Comply with all local and national rules and regulations associated with this product.
- Only trained and competent personnel are permitted to inspect, repair and service the product. Dräger recommends a Dräger service contract for all maintenance activities and that all repairs are carried out by Dräger.
- Use only genuine Dräger spare parts and accessories, or the proper functioning of the product may be impaired.
- Do not use a faulty or incomplete product and do not modify the product.
- Notify Dräger in the event of any component fault or failure.

1.2 Definitions of alert icons

The following alert icons are used in this document to provide and highlight areas of the associated text that require a greater awareness by the user. A definition of the meaning of each icon is as follows:



WARNING

Indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in physical injury, or damage to the product or environment. It may also be used to alert against unsafe practices.

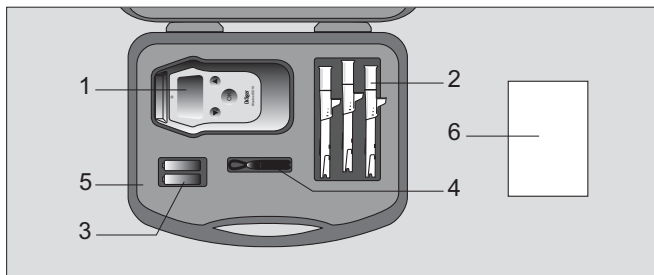


NOTICE

Indicates additional information on how to use the product.

2 Description

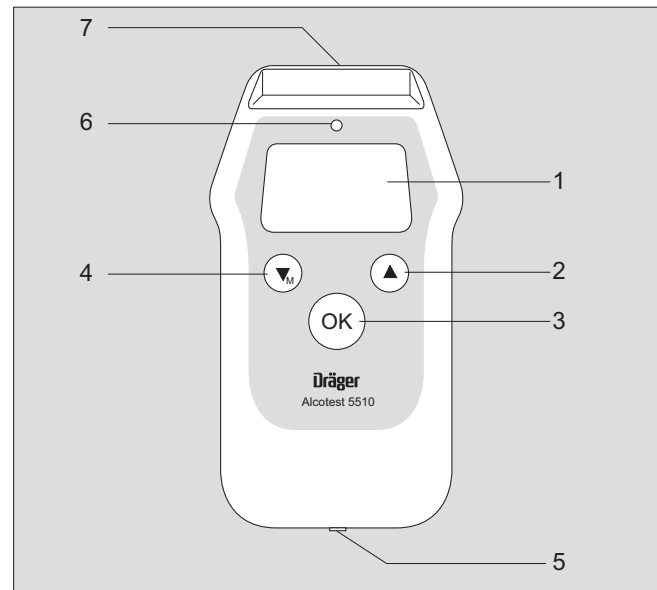
2.1 Product overview



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Case

- 1 Measuring device Dräger Alcotest® 5510
- 2 Mouthpieces, 3 pieces
- 3 Batteries, 3 pieces
- 4 Wrist strap
- 5 Transport case
- 6 Quick Guide



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Measuring device

- 1 Display
- 2 "UP" menu key
- 3 "OK" key
- 4 "DOWN/MENU" menu key
- 5 Socket
- 6 Light, red/green
- 7 Mouthpiece receptacle

2.2 Intended use

The Dräger Alcotest® 5510¹ is used to quickly measure the alcohol concentration in a person's breath. The device is suitable for portable and battery-powered operation.

2.3 Device symbols and displays

The measured breath alcohol value is specified in the basic device setting, in the unit of mg/L (= milligrams of ethanol per litre of breath). The device can be converted to all common units of measurement at the factory or by DrägerService.

2.3.1 Device symbols



Symbol for "See Instructions for Use".

2.3.2 Keys



OK key
Confirms entries or selected functions.
Key for switching the device on and off.



DOWN/Menu and UP key
Setting values and selection of menu functions.

2.3.3 Battery symbol

Indicates the batteries' state of charge:



Battery full



Battery 2/3 full



Battery 1/3 full



Battery empty

2.3.4 Menu



Return to the next menu level up



Menu item with submenu



Open menu item



Available function



Further entries below the visible entries



Further entries above the visible entries

2.3.5 Function



Activated function

1/6 Current display (1) of the total display number (6)

1) Alcotest® is a registered trademark of Dräger.

3 Use

3.1 Prerequisites

- The ambient air must be free from alcohol and solvent vapours (disinfectants).
- Maintain an adequate distance from mobile telephone antennas and transmitter sites so as not to impair the function of the device.
- Observe a waiting period of at least 15 minutes after the last oral alcohol intake!
Residual alcohol in the mouth can distort the measurement. Even aromatic beverages (e.g. fruit juice), alcoholic mouth sprays, medical juices and drops, and belching and vomiting may result in false data. Also observe a waiting period of at least 15 minutes in these cases. Rinsing the mouth with water or non-alcoholic drinks does not replace the waiting time!
- The test person should breathe regularly and calmly before the sample is taken. Avoid breathing in and out quickly through the mouth.
- The test person must be capable of exhaling the minimum breath volume of 1.2 l (works setting). For the test, the breath flow must fall within a certain minimum exhalation time (factory setting 2 seconds). The volume and the time can be changed via the menu, if required.

3.2 Preparations for Use

The device is delivered already calibrated from the factory. If the calibration date was more than 6 months previously: Calibrate the device or have it calibrated by DrägerService. The date of the last calibration can be viewed in the Quick Menu (see section 4.3 on page 13).

3.2.1 Inserting or replacing the batteries / rechargeable batteries



CAUTION

Explosion hazard!

Do not throw used batteries/rechargeable batteries into a fire or open them by force. Do not recharge alkaline batteries. Batteries/rechargeable batteries must be disposed of in accordance with local and national regulations.

It is not possible to charge the rechargeable batteries in the device. Do not connect any chargers to the socket. The device may be destroyed as a result.

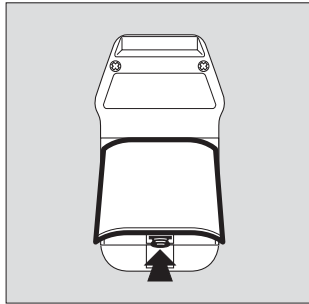


NOTICE

To ensure that the device can be used again immediately after the alkaline batteries or the rechargeable NiMH batteries are discharged, it is recommended to have replacement batteries available.

Replace the batteries within 5 minutes, otherwise the save time will be reset and must be set again.

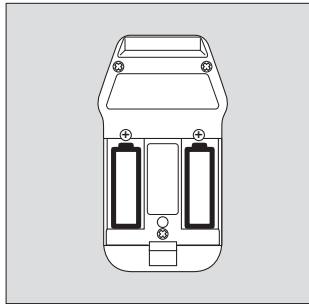
1. Press the catch on the battery cover in gently and remove the battery cover.
Observe the correct polarity when inserting the batteries.
2. Close the battery cover.



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Required batteries:

- 2 pcs. 1.5 V Alkaline (LR6, AA)
- or
- 2x 1.2 V NiMH rechargeable battery

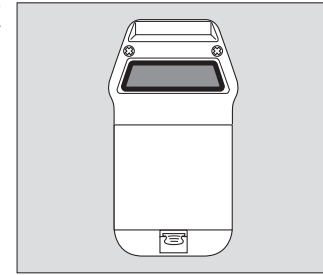


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3.2.2 Attaching the Quick Guide

There is a space provided for the Quick Guide on the rear of the casing. Quick Guides in English, German, French and Spanish are supplied with the device.

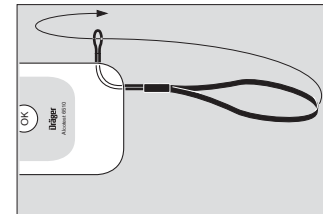
1. Remove the appropriate label from the backing film.
2. Stick the label to the casing in the space provided.



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3.2.3 Fitting the wrist strap

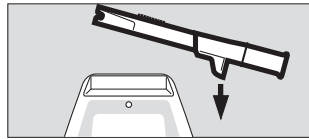
1. Pass the fastening cord of the wrist strap through the hole in the casing and form a loop.
2. Pull the lower part of the strap through the eye created.



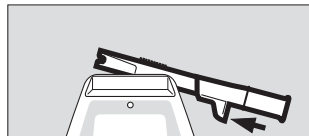
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3.2.4 Attach the mouthpiece

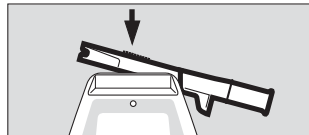
1. Remove the mouthpiece from the packaging. For reasons of hygiene, leave the protective wrapping around the mouth contact area until the mouthpiece is firmly attached to the device.
2. With the fluted markings (= press-on surface) facing upwards, press the mouthpiece into the mouthpiece receptacle. The mouthpiece audibly snaps into place.
3. Then remove all packaging. The mouthpiece can be used facing to the right or to the left.



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3.2.5 Switching on and off

To switch the device on:

- Press and hold the **OK** key for approx. 1 second until the start window appears. A self check is carried out.



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To switch the device off:

- Keep the **OK** key pressed. The device will switch off after approx. 2 seconds.



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NOTICE

The device will switch off automatically approx. 4 minutes after the last use.

When the batteries or rechargeable batteries are discharged, the battery symbol flashes and then the device switches off automatically.

3.3 Automatic Measurements



CAUTION

Do not allow any high alcohol concentrations on the sensor, e.g., by rinsing the mouth with a high proof alcohol shortly before the measurement, as this will shorten the service life of the sensor. Observe a waiting period of at least 15 minutes after the last oral intake of alcohol!



NOTICE

A new mouthpiece must be inserted for each test subject.

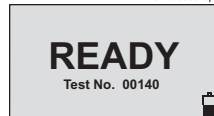
With automatic measurement, the device takes the sample automatically as soon as the test subject has given a breath sample that is sufficient into the mouthpiece of the device and the end of the breath sample has been recognised by the device.

To carry out an automatic measurement:

1. Insert a new mouthpiece into the holder.
(see section 3.2.4 on page 9).
2. Switch on the device (see section 3.2.5 on page 9).
After 2 seconds the display shows:
Self Test.
After about 6 seconds, **READY** will appear on the display and a short acoustic signal will sound. At the same time the current test number is displayed.
The light flashes green.
The device is ready to use.



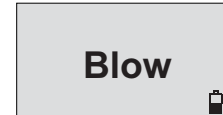
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3. Request the test subject to blow into the mouthpiece evenly and without interruption. An adequate flow of breath is confirmed by a continuous tone and the green light.

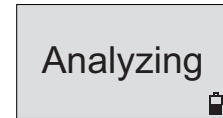
While the breath sample is being given, **Blow** appears on the display.



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When the breath sample has been given, the green light goes out, the continuous tone will stop and a short clicking sound can be heard.

On the display, **Analyzing** appears.



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The test result will appear on the display after 5 to 25 seconds (depending on the the device temperature and the measured concentration).
The measurement result is displayed with the corresponding unit. The units are factory-set to mg/L (milligrams of ethanol per litre of breath).



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4. Push the mouthpiece upwards out of the mouthpiece holder.
5. Dispose of the mouthpiece in accordance with local regulations.



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3.3.1 Carry out another measurement

- Press the **OK** key to prepare for a new measurement. While the device is waiting until it is ready to take a measurement, see section 9 on page 16, the display counts down the time until the device is next ready.



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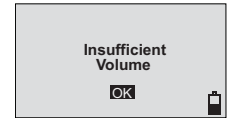


NOTICE

Periodically switching off the device does not reduce this waiting period!

3.3.2 Errors when giving the breath sample

If the volume of the breath sample is too small, **Insufficient volume** will appear on the display. A short acoustic signal sounds and the light flashes red.



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- Press the **OK** key to repeat the measurement. After approx. 4 seconds, the device is ready for measuring.

In the case of very irregular exhalation, e.g. sudden termination or suction at the end of the breath sample, **Blow interruption** appears on the display. A short acoustic signal sounds and the light flashes red.



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- Press the **OK** key to repeat the measurement. After approx. 4 to 30 seconds, the device is ready for measuring.


3.4 Additional Sampling Options

The functions can be switched on or off at the factory or by DrägerService, and also in combination.

3.4.1 Passive Sampling

With passive sampling, the sampling is initiated manually by the device user. Possible applications include the testing of ambient air or the breath of uncooperative (e.g. unconscious) persons for the presence of alcohol.

To carry out passive sampling:

1. Switch on the device (see section 3.2.5 on page 9).
2. Hold the ready to measure **device without mouthpiece** in the air to be analysed.
3. Briefly press the  key.
Display for "No alcohol present":



NO
ALCOHOL


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Display for "Alcohol present":




ALCOHOL

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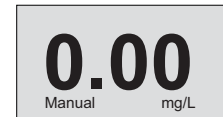
4. Press the  key for a new measurement.

3.4.2 Manual Sampling

Sampling can also be triggered manually if the test subject cannot produce the required minimum breath volume.

1. Preparation as for automatic measurement (see section 3.3 on page 10).
2. When **Blow** appears on the display after exhalation has begun, briefly press the  key.

When the result is displayed, the message **Manual** also appears on the display.




0.00
Manual mg/L







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4 Quick menu

4.1 Calling up the Quick Menu

1. Switch on the device.
The menu functions can be called up after **WAIT** or **READY** appears.
2. Briefly press the  key.
The Quick Menu will be displayed.

4.2 Operation

- Select the functions using the  and  keys.
- The selected function is displayed inverted.
- Activate the selected function with the  key.
- When the selected function is displayed, the top line contains the current menu function.
- Selecting  **Back to measurement** or  **Back to menu** returns the device to measurement mode or to the previous menu level when the  key is pressed.






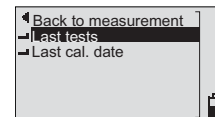
NOTICE

If no key is pressed within 120 seconds, the device automatically returns to the measurement mode.

4.3 Menu items


■ Last tests

Select the tests with the  and  keys.
Go back with the  key.



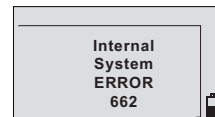
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■ Last cal. date

Displays the date of the last calibration.
Go back with the  key.

5 Device faults

An error message (see section 6 on page 14) will appear if a device fault occurs.



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The number that appears below the message is used for service functions. If the fault persists even after the device has been switched on and off several times, contact DrägerService.

6 Troubleshooting

Fault	Cause	Remedy
Device switches off automatically.	Device has been ready to measure for longer than 4 minutes.	Switch the device back on.
	(Rechargeable) batteries drained.	Replace the batteries, see section 3.2.1 on page 7.
Menu is exited automatically.	Device automatically jumps to the measuring function after 120 seconds.	Select menu item again.
Device cannot be switched on.	Batteries discharged.	Insert new batteries or charge batteries.
Insufficient volume / sample invalid.	Test subject is blowing intermittently or not hard enough.	Have test subject blow with more force and without interruption.

Error message on the display	Cause	Remedy
"Calibration Test incorrect"	Calibration test not successful.	Repeat calibration test; contact DrägerService if necessary.
↑ ↑ ↑	Measured value exceeds the display range (alcohol possibly present in the mouth).	Observe a waiting period of at least 15 minutes after the last oral alcohol intake.
"Internal System ERROR" with error number	Device fault, measurement not possible.	Remove the batteries/rechargeable batteries (minimum of 2 seconds) and re-insert, contact DrägerService, if required.

7 Maintenance

7.1 Maintenance intervals

As necessary:

- Replace the batteries, see section 3.2.1 on page 7.

Every six months:

- Check calibration, see section 7.4 on page 15.

7.2 Cleaning



CAUTION

Damage to the device! Do not immerse the device in liquids and make sure liquids do not penetrate the connectors.

Wipe the device to be cleaned with a disposable cloth.
Do not use detergents that contain alcohol or solvents.

7.3 Storage

Do not store the device in environments which contain alcohol. The device consumes power, also when switched off. Therefore, remove the battery for extended disuse.



CAUTION

Damage to the device!

For long term storage (longer than 6 months), remove the batteries or rechargeable batteries from the device. This will prevent damage due to leaking battery acid.

7.4 Calibration

- Only by authorised persons.
- Calibration recommended every 6 months.
- The last calibration date entered can be viewed under menu item **Last cal. date**.

8 Disposal

Dispose of the product in accordance with the applicable rules and regulations.

8.1 Disposal of the device



According to the 2002/96/EC directive, the product must not be disposed of as municipal waste. It is therefore labelled with the symbol depicted here.

The product can be returned to Dräger free of charge. For information, please contact the national sales organisations and Dräger.

8.2 Battery disposal



According to the 2006/66/EC directive, batteries and rechargeable batteries must not be disposed of as municipal waste. They are, therefore, marked with the adjoining symbol. Collect and dispose of batteries and rechargeable batteries at battery collection centres, in accordance with applicable regulations.

9 Technical data

Measuring principle	Electrochemical Sensor
Measuring range	
Breath alcohol concentration	0.00 to 2.5 mg/L 0 to 2500 µg/L 0.000 to 0.500 g/210L 0 to 250 µg/100mL 0 to 250 µg% (Ethanol mass per breath volume at 34 °C and 1013 hPa.)
Blood alcohol concentration	0.00 to 5.00 ‰ 0.000 to 0.500 ‰ 0.00 to 5.00 g/L 0 to 500 mg/100 mL 0 to 500 mg% 0.00 to 5.00 mg/mL (Ethanol mass per blood volume resp. mass at 20 °C and 1013 hPa. By giving this data a conversion factor of 2100 between breath and blood alcohol concentrations is used.)
Display range	
The range of indication and the measuring range are identical. If the result is exceeding the measuring range the display will show three arrows "↑↑↑" as overflow indication.	

Ambient conditions	
For operation	-5 to +50 °C (23 to 122 °F) 10 to 100 % r.h. (non condensing) 600 to 1400 hPa
For storage	-40 to +65 °C (-40 to 149 °F)
Sample conditions	
minimal blowing time	selectable 2 s default
minimal volume	selectable 1.2 L default
Measurement accuracy	
Reproducibility with an ethanol standard	
up to 0.50 mg/L	0.008 mg/L
≥ 0.50 mg/L	1.7 % of measured value
up to 0.100 ‰	0.0017 ‰
≥ 0.100 ‰	1.7 % of measured value
Values for other units of measure can be calculated according to table on page 16.	

Waiting time until device is ready to use

1st measurement about 6 s

after a previous measurement with:
(breath alcohol concentration is indicated)

0.25 mg/L 20 s

0.50 mg/L 40 s

1.00 mg/L 80 s

> 1.5 mg/L 120 s

after a previous measurement with:
(blood alcohol concentration is indicated)

0.050 % 20 s

0.100 % 40 s

0.200 % 80 s

> 0.300 % 120 s

Intervals for other units of measure selected can be calculated accordingly (see page 16).

Calibration

Calibration interval depends on required accuracy,
typically: 12 months

Dimensions

142 mm x 75 mm x 36 mm
(H x W x D)

Weight

approx. 195 g

Electrical supply

Batteries	2 x 1.5 V Type Alkaline (Mignon, LR6, AA) approx. 1500 measurements
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10 Order list

Name and description	Order no.
Dräger Alcotest 5510 (Standard) (Measuring device, 3 mouthpieces, 2 batteries, hand strap and case)	83 22 650
Dräger Alcotest 5510 (Customer-specific configuration) (Measuring device, 3 mouthpieces, 2 batteries, hand strap and case)	83 22 653
Accessories	
Mouthpieces, hygienically tested	
100 pcs.	68 10 690
250 pcs.	68 10 825
1000 pcs.	68 10 830
Mouthpieces with non-return valve hygienically tested	
100 pcs.	68 11 055
250 pcs.	68 11 060
1000 pcs.	68 11 065
Alkaline battery (1 piece)	13 35 804
NiMH battery (1 piece)	18 90 092
Case for Dräger Alcotest 5510	83 179 20
Leather case for Dräger Alcotest 5510 (belt attachment)	83 17 911
Leather case for Dräger Alcotest 5510 (yellow) (Device can be operated from the case)	83 17 931

Name and description	Order no.
Calibration accessories	
Wet gas simulator	on request
Ethanol standard solution 1.0 ‰ (1 x 500 mL)	67 28 838
Calibration kit	83 17 927
Calibration gas, ethanol-nitrogen (34 L)	68 10 920
Calibration gas, ethanol-nitrogen (103 L)	68 10 695
Pressure reducer for gas	68 10 693

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