Alcotest® 6510

Atemalkohol-Messgerät

Breath Alcohol Monitor



Gebrauchsanweisung

Instructions for Use

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Zu Ihrer Sicherheit

Gebrauchsanweisung beachten
Jede Handhabung an dem Gerät setzt die genaue Kenntnis und Beachtung dieser Gebrauchsanweisung voraus.
Das Gerät ist nur für die beschriebene Verwendung bestimmt.

Instandhaltung
Instandsetzung am Gerät nur durch Fachleute.
Für die Instandsetzung empfehlen wir den DrägerService.
Bei Instandhaltung nur Original-Dräger-Teile verwenden.
Kapitel "Instandhaltungsintervalle" beachten.

Zubehör
Nur das in der Bestell-Liste aufgeführte Zubehör verwenden.

Haftung für Funktion und Schäden
Die Haftung für die Funktion des Gerätes geht in jedem Fall auf den Eigentümer oder Betreiber über, soweit das Gerät von Personen, die nicht dem DrägerService angehören, unsachgemäß gewartet oder instandgesetzt wird oder wenn eine Handhabung erfolgt, die nicht der bestimmungsgemäßen Verwendung entspricht.
Für Schäden, die durch Nichtbeachtung der vorstehenden Hinweise eintreten, haftet Dräger nicht.
Gewährleistungs- und Haftungsbedingungen der Verkaufs- und Lieferbedingungen von Dräger werden durch vorstehende Hinweise nicht erweitert.

Dräger Safety AG & Co. KGaA

_____
® Alcotest ist eine eingetragene Marke von Dräger.

For your safety

Strictly follow the instructions for use
Any use of the instrument requires full understanding and strict observation of these instructions.
The instrument is only to be used for the purposes specified herein.

Maintenance
Maintenance must only be performed by experts.
We recommend that a service contract be obtained with Dräger-Service and that all repairs be carried out by them.
Only authentic spare parts may be used for maintenance.
Observe chapter "Maintenance intervals".

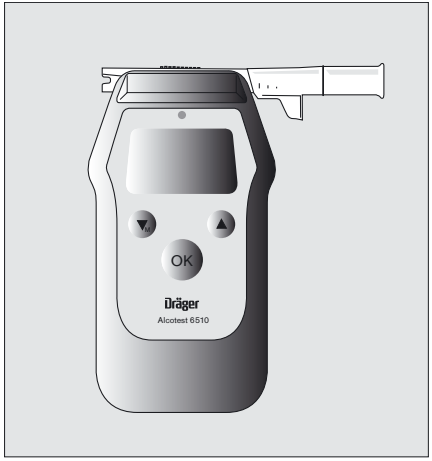
Accessories
Only the accessories specified in the order list may be used.

Liability for proper function or damage
The liability for the proper function of the instrument is irrevocably transferred to the owner or operator to the extent that the instrument is serviced or repaired by personnel not employed or authorized by DrägerService or if the instrument is used in a manner not conforming to its intended use.
Dräger cannot be held responsible for damage caused by non-compliance with the recommendations given above.
The warranty and liability provisions of the terms of sale and delivery of Dräger are likewise not modified by the recommendations given above.

Dräger Safety AG & Co. KGaA

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® Alcotest is a registered trademark of Dräger.

Intended use



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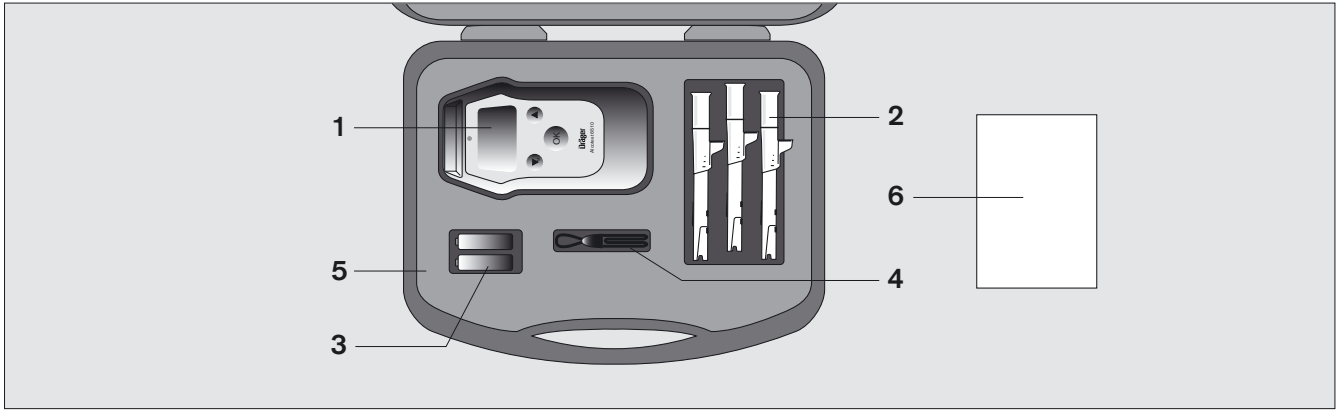
For quick measurement of a person's alcohol concentration through measurement of the breath alcohol concentration. For mobile use with batteries.

Preparation

Alcotest® 6510 is supplied with standard calibration by the manufacturer.
If the calibration date exceeds the period of 6 months: recalibrate instrument or have it calibrated by DrägerService.
The date of the last calibration can be found in the quick menu (page 24).

What‘s what?

Case



1 Alcotest® 6510 monitor

2 Mouthpieces, 3 pieces

3 Batteries, 2 pieces

4 Hand strap

5 Transport case

6 Brief instructions for use

Messgerät

1 Anzeige

2 Menütaste "AUF"

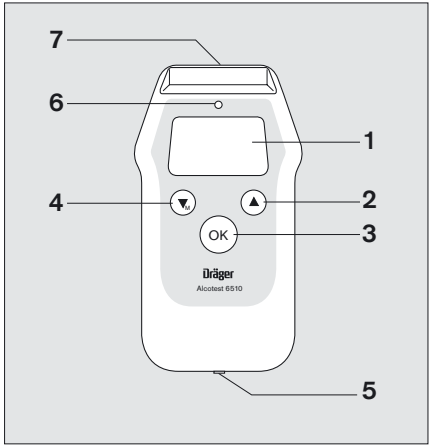
3 Taste "OK"

4 Menütaste "AB/MENÜ"

5 Buchse

6 Lampe rot/grün

7 Mundstückaufnahme



Measuring instrument

1 Display

2 Menu button "UP"

3 "OK" button

4 Menu button "DOWN/MENU"

5 Socket

6 Lamp red/green

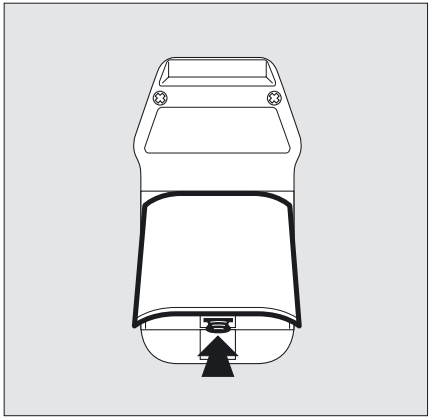
7 Mouthpiece receptacle

Preparation

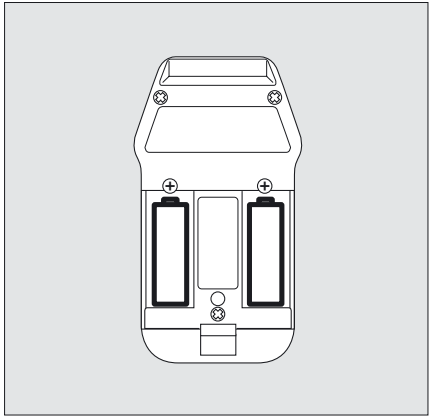
Inserting the batteries

Upon initial operation or if the battery symbol on the display indicates "**empty**".





- Gently press onto the lock of the battery compartment and remove cover.
- Observe correct polarity when inserting the batteries!
- Close battery cover.



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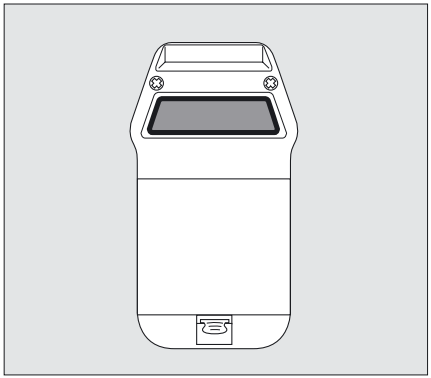
Batteries to be used
2 each 1.5 V Type Alkaline (Mignon, LR6, AA)

or

rechargeable battery 2*1.2 V NiMH

Note:
Charging batteries while in the instrument will cause damage to the instrument.

Attaching the brief instructions for use



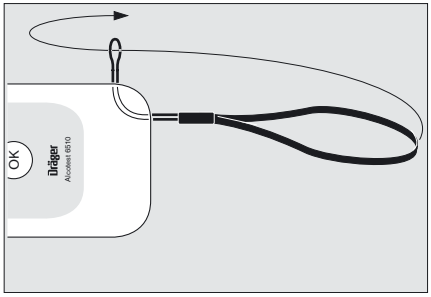
An area for the "brief instructions for use" sticker is provided on the back of the instrument.

— The instrument is delivered with the brief instructions in English, German, French and Spanish language.

— Remove sticker from the carrier foil.

— Position the sticker onto the area provided on the back of the housing.

Fixing the hand strap



- Insert the smaller loop into the hole in the housing.
- Thread the longer loop through the eyelet and pull through.

Symbols and readings

The measured breath alcohol value is given in mg/L for the basic setting of the Alcotest® 6510. The instrument can be switched over to all usual measuring units (page 30).

Symbols
In these instructions for use several symbols are used corresponding to the messages indicated on the display:

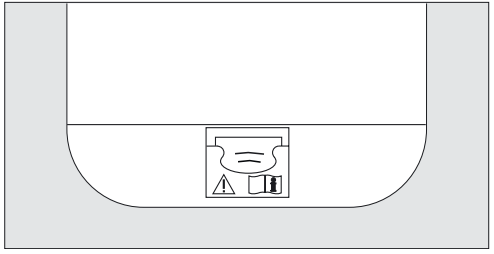
Battery symbol
Indicates the battery charging status:

Full battery

50 % battery capacity

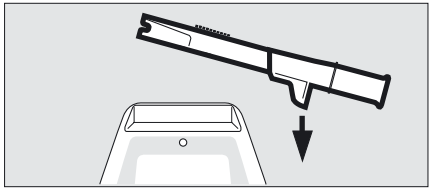
Empty battery

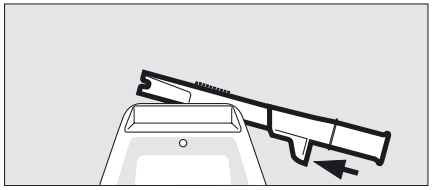
Note:
The symbols under the battery flap mean: Attention! Please consult the user instructions!
Before changing batteries, please read the instructions.
The service socket is not for charging. Never insert a power cable!



Buttons

OK	"OK"-button Confirms entries or selected functions. Button to switch instrument on and off.
▼ ▲	"DOWN" and "UP" Setting of values and selection of menu functions.







Fitting the mouthpiece

- Open packaging. To keep the mouthpiece hygienic, retain the portion to corne in contact with mouth covered by packaging until mouthpiece is correctly fitted to the instrument.
- With the grooved markings facing up, press the mouthpiece into mouthpiece receptacle until audible sound confirms correct engaging.
- Remove packaging completely and commence breath test.

Mouthpiece can be used with orientation to right or left side.

Switching on and off

Switch on

- Keep (OK) - button pressed for approx. 1 second until startwindow is displayed.



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Switch off

- Keep (OK) - button pressed.

The instrument switches off after 2 seconds.



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Automatic switch off

The instrument switches off automatically 4 minutes after the last use.

When the batteries are discharged the instrument switches off automatically.



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Messung durchführen

Voraussetzungen

— Für jede Testperson ist ein neues Mundstück einzusetzen.

— Keine hohen Alkoholkonzentrationen auf den Sensor geben, z.B. durch Spülen des Mundes mit hochprozentigen Alkoholika kurz vor der Messung. Hierdurch verringert sich die Lebensdauer des Sensors.

— Genügend Abstand zu Antennen von Mobiltelefonen und zu Sendeanlagen einhalten.

Anforderungen an die Testperson

— Wartezeit mindestens 15 Minuten nach der letzten Alkoholaufnahme in den Mund!
Restalkohol im Mund kann die Messung verfälschen. Auch bei aromatischen Getränken (z.B. Fruchtsaft), alkoholischen Mundsprays, medizinischen Säften und Tropfen und nach Aufstoßen und Erbrechen können Verfälschungen auftreten. Eine Mundspülung mit Wasser oder nichtalkoholischen Getränken ersetzt die Wartezeit nicht!

— Die Testperson soll vor der Probenahme normal und ruhig atmen. Schnelles Ein- und Ausatmen durch den Mund ist zu vermeiden.

— Die Testperson muss in der Lage sein, das erforderliche Mindestatemvolumen von 1,2 L (Werkseinstellung) abzugeben. Der Atemstrom muss hierbei für eine gewisse Mindestblaszeit (Werkseinstellung 2 Sekunden) anliegen. Volumen und Zeit können bei Bedarf über das Menü geändert werden (siehe Seite 29).

Performing the Measurement

Conditions

— A new mouthpiece is to be used for every person tested.

— Do not apply too high alcohol concentrations on to sensor, e.g. by rinsing the mouth with high-grade alcohols shortly before the measurement. By doing so the sensor service life is reduced.

— Keep sufficient distance to the antennas of mobile phones and transmitting stations.

Requirements of the person to be tested

— Maintain a waiting period of at least 15 minutes after drinking alcohol!
Residual alcohol in the mouth can distort the measurement. Aromatic drinks (e.g. fruit juice), mouth sprays containing alcohol, medicines can interfere with measurements. Rinsing the mouth with water or non-alcoholic drinks does not reduce this waiting period!

— Before sampling the person to be tested must breathe normally. Quick inhaling and exhaling through the mouth must be avoided.

— The person to be tested must be able to provide the required minimum air volume of 1.2 L (factory setting). The breath flow must be constant for a certain minimum blowing period (company setting 2 seconds). Volume and time can be changed via the menu, if necessary (see page 29).

Automatic measurement

The sampling is activated automatically after the minimum breathing volume and the minimum blowing period are reached.

Preparation

- Insert new mouthpiece in the holder (page 13).
- Switch instrument on (page 14).



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After 2 seconds:

– the user info screen (if activated, page 29)
  or
  "**WAIT**" is indicated on the display.
- The user info screen can also be viewed by pressing the ▲ - button. Close with the OK - button



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After approximately 6 seconds "**READY**" is displayed and a short audible signal is given. At the same time the current test number is indicated. A green light flashes.

The instrument is ready for measurement.



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Performing the measurement

- Ask the test subject to blow evenly into the mouthpiece without interruption. A sufficient flow is indicated by a continous tone and a green light.

While the sample is taken the display shows:
"Blow"



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When the sampling was successful the green light will cease and the continous tone will stop.

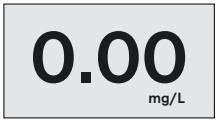
The display shows:
"WAIT Analyzing"



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Test result

After 5 to 25 seconds (depending on the instrument temperature and the measured concentration) the measured value is shown on the display.



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The value is shown with the respective measuring unit.

The standard setting by the manufacturer is mg/L (milligram ethanol per liter breath air). The setting can be changed via the main menu (page 30).

Error in delivering the breath sample

If the sampling volume is too low the display shows: **"Insufficient Volume"**
The horn sounds briefly and a red light flashes.



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To repeat press the (OK) - button. The instrument is ready for measurement after 4 seconds.

When exhaling improperly, e.g. by abruptly stopping to exhale or sucking at the end of the sampling, the display shows:
"Blow Interruption"
The horn sounds briefly and a red light flashes.



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Press the (OK) - button to repeat the measurement. Time period until the instrument is ready for measurement again: 4 to 30 seconds.

Further measurement

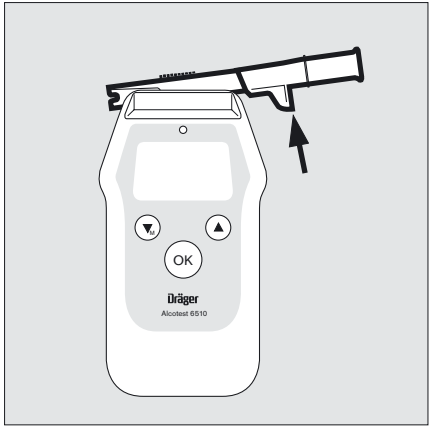
- By pressing the (OK) - button a new measurement is prepared.
  During the recovery period of the sensor (see “Technical data” on page 45) the display shows: **"WAIT"**



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Note:
Switching the instrument off in the meantime does not reduce the waiting period!

Removing the mouthpiece



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- Push the mouthpiece out of the mouthpiece holder.
- Dispose of the mouthpiece in accordance with local regulations.

Additional possibility for sampling

The functions can be switched on or off in combination also in the main menu (page 25).

Passive sampling

During the passive sampling the sampling system is manually activated by the user of the instrument. Possible applications for this function are testing of the ambient air or the exhaled air for alcohol concentrations of persons not able to cooperate (e.g. unconscious persons).

- Hold the **instrument without a mouthpiece** into the air to be analyzed.
- Press the (OK) - button shortly.

Screen 1:
No alcohol available



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or:

Screen 2:
In case of alcohol



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- Press the (OK) - button for a new measurement.

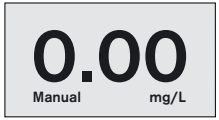
Manual sampling

The sampling can also be activated manually, if the person to be tested is not able to provide the required minimum volume.

Preparation as for the automatic measurement (page 16).

- If "Blow" is indicated on the display after exhaling has started, briefly press the (OK) - button shortly.

When the measured value is displayed "**Manual**" is indicated additionally.



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Menu

Activation

Switch instrument on. When "**WAIT**" or "**READY**" appears on the display the menu functions can be called up.

- For quick menu press button ▼ shortly.
- For main menu keep button ▼ pressed for at least 3 seconds.

Operation

– Select functions using ▼ and ▲ buttons.

– The selected function is highlighted.

– Activate the selected function by pressing OK - button.

When the selected function is displayed the top line contains the current menu function.

– Selection " ◀ **return to measurement**" or " ◀ **return to menu**" and pressing the OK - button brings the instrument into the measuring mode or to the former menu level back.

If no button is pressed within 120 seconds, the instrument automatically returns to the measuring mode.

Symbols on the display

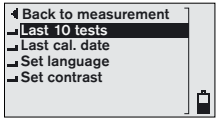
Menu

- Return to next higher menu level
- Menu item with sub-menu
- Open menu item
- Selected function
- Further items below the visible items
- Further items above the visible items

Function

- Activated item
- 1/6 Actual screen (1) of all screens (6)

Quick menu



Last 10 tests
Selection of the tests with ▼ and ▲. Back with OK - button.

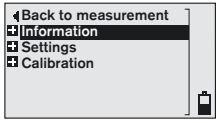
Last cal. date
Display of last calibration date. Back with OK - button.

Select language
English, German, French, Spanish, user defined language to be load in the instrument.

Set contrast
Change by pressing ▼ and ▲. Back with OK - button.

Main menu

The main menu consists of three sub-menus



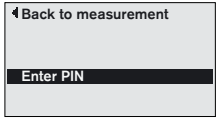
02923757_1_en.eps

– Information
– Settings
– Calibration

Access to the main menu is protected by a PIN.

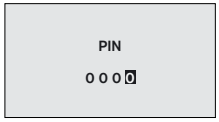
Entering the PIN

The display shows:
"**Enter PIN**".



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- Press (OK) - button.
- Select number or letter by pressing (▼) and (▲).
- Acknowledge by pressing (OK) - button and enter next digit.



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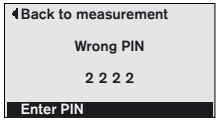
After the fourth entry the main menu is displayed.

Note:
The PIN 0000 was set by the manufacturer.

It can be changed under settings "**Change PIN**" (page 29).

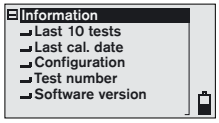
In case of a wrong PIN the display shows "Wrong PIN" together with the entered PIN.

- Press (OK) - button and enter new PIN.



Information

The menu item "**Information**" includes the following items:

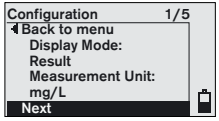


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- Last 10 tests
- Last cal. date
- Configuration
- Test number
- Software version

Last 10 Tests, Last cal. date
see quick menu (page 24).

Configuration
Under configuration you will find the current instrument settings that can be changed under the menu item settings (page 29). Here you will find more information concerning these items.



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Display mode
Display of the measured value in numbers or as a range.

Measurement unit
Measuring unit of the alcohol concentration (factory setting mg/L).

Pass, Alert, Fail, High
Set limit values for the display modes PAF, PF und ZPWF.

Auto sample
Type of sampling: in case of definite volume or end of breath sample.

Additional sample
Activated additional functions such as manual or passive sampling.

Volume
Minimum exhalation volume in liters.

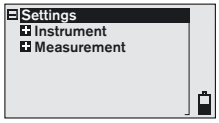
Time
Minimum blowing time in seconds.

Test number
Display of the of the next test.

Software version
Display of the part number and the software version.

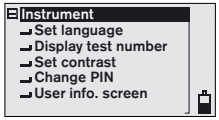
Settings

The menu item "**Settings**" includes the following items:



– Instrument
– Measurement

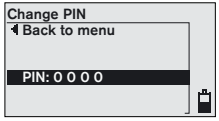
Instrument



Select language, set contrast
see quick menu (page 24).

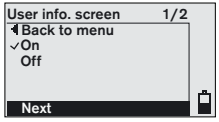
Testnummer
Activate or deactivate the display of th testnummer.

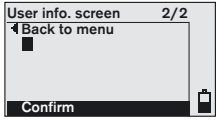
Change PIN
Enter the new 4 digit PIN by pressing ▼ , ▲ and the OK - button.
(Numbers and letters are possible).



Attention:
If a changed PIN code is no longer available, only DrägerService has access to the menu.

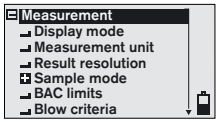
Individual information
Entry of up to 3 lines with 15 characters each pressing ▼ , ▲ and OK - button.
(Numbers and letters are possible).
For finishing a line keep OK - button pressed until the line appears inverted.
Confirmation with OK - button stores the text.
These symbols are indicated when switching on the instrument.

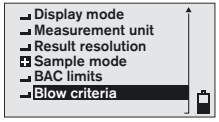




Measurement

Setting of parameters and limit values for the measurement.





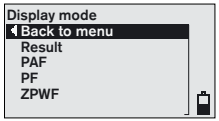
Display mode

Selection of the result presentation:

a) numerical = corresponding to the set measuring unit

b) Allocation of the result to concentration ranges with selected range limits.
Available:

– PAF = Pass, Alert, Fail
– PF = Pass, Fail
– ZWPF = Zero, Warn, Pass, Fail



Measuring unit

Selection of the measuring unit for the final result:

%, ‰, mg/L, µg/L, g/210 L, µg/100mL, µg/%, g/L, mg/100mL, mg%, mg/mL

Result resolution

Selection of the measurement resolution.

Sample mode

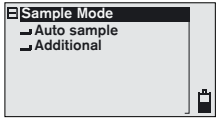
Auto sample

Selection of the mode of time for sampling:

a) definite volume
Sampling is complete when minimum volume is reached.

or

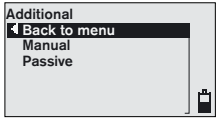
b) End of breathing
sampling is complete at the end of exhalation.



Additional sample

Manual activation of sampling and lower minimum volume

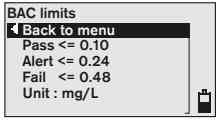
— **Passive**
— **Manual**



Also refer to page 20 and page 21.

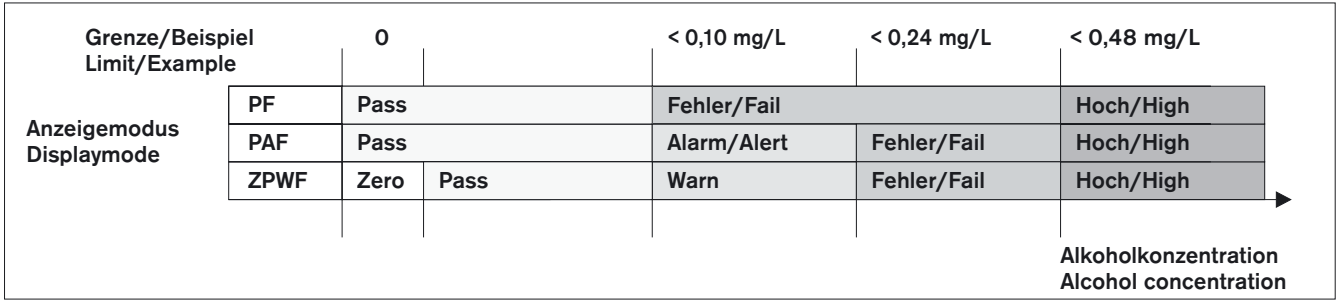
BAC - limits

Three range limits "**Pass, Alert, Fail**" for the display modes PAF, PF and ZWPF.



- Select and enter by pressing ▼, ▲ and OK –button.

The illustration on the following page shows the connection between the limits and the display of the result.



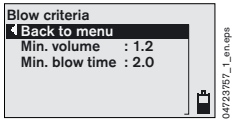
Example for factory's setting.

Factory settings

- Pass: < 0,10 mg/L
- Alert: < 0,24 mg/L
- Fail: < 0,48 mg/L
- High: ≥ 0,48 mg/L

Blow criteria

Setting of the minimal breathing volume and the minimum blowing time for a valid sample.
After selection of the function, entry in liters (L) by pressing ▼ , ▲ und OK .



Factory setting is 1.2 L and 2 seconds.

Control mode

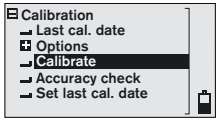
Increased resolution with 3 decimal places only for measuring unit mg/L and µg/L.
Parameter settings are reset after switching off the instrument.

It is possible to activate all functions simultaneously.

Calibration

Last cal. date

In the sub-menu item **"Last cal. date"** the calibration date last entered can be viewed, see quick menu (page 24).



Options

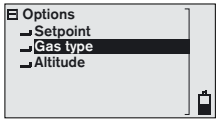
Setting of the follwing items with the ▼ , ▲ and the OK - button.

Setpoint

concentration of test gas in the set measuring unit

- Calibration
- Accuracy check

(permissible calibration range, see "Technical data" page 48).



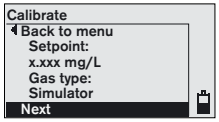
Gastype

wet = bath gas, dry = dry gas

Altitude

height above sea level, only necessary for dry test gas
(selectable unit: metres or feet)

Calibration

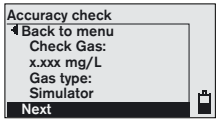


- After pressing the (OK) -button the display shows the "**Setpoint**" and the "**Gas type**".
- After pressing the (OK) -button the instrument will be ready for calibration.
- When "**Supply gas**" is shown supply respective gas.
- A minimum flow rate of 3 L/min to obtain "**Gas flow OK**" on display.
- The instrument performs the calibration automatically.
- After successful calibration the message "**Calibration OK**" is displayed.
- A message "**Calibration Error**" displayed requires the calibration to be repeated.

Repeat calibration in case.

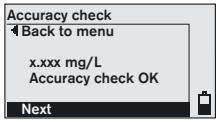
Accuracy check

- Enter the "**Accuracy check**" item by using the (OK) -button. The display shows the calibration gas to be used.



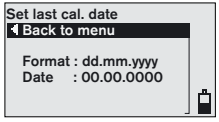
- Follow the sampling procedure described for calibration.

After successful accuracy check the result is displayed.



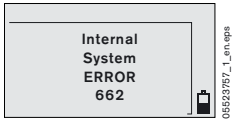
Enter calibration date

- Use (▼) , (▲) and (OK) - button in "**Enter cal. date**" menu to enter the format and the date.



Error

In case of internal error, the following error message is displayed.



If the failure still occurs after the instrument is switched on and off several times, contact DrägerService.

Instandhaltung

Instandhaltungsintervalle

Bei Bedarf:
- Batterien auswechseln, siehe Seite 38.

Halbjährlich:
- Kalibrierung überprüfen, siehe Seite 40.

Lagerung

- Das Alcotest® 6510 verbraucht auch im ausgeschalteten Zustand etwas Strom. Deshalb bei längerer Nichtbenutzung die Batterie aus dem Gerät nehmen.

Hinweis: Bei langer Lagerung
Batterien aus dem Gerät herausnehmen, wenn das Gerät länger als 6 Monate nicht benutzt wird. Dies verhindert eine Beschädigung des Gerätes durch auslaufende Batteriesäure.

Vorsicht:
Verbrauchte Alkali Batterien nicht ins Feuer werfen, nicht wieder aufladen, nicht gewaltsam öffnen, Explosionsgefahr!

– Nur als Sondermüll entsorgen, entsprechend den örtlichen Abfallbeseitigungsvorschriften.

Auskünfte erteilen die örtlichen Umwelt- und Ordnungsämter sowie dafür geeignete Entsorgungsunternehmen.

Maintenance

Maintenance intervals

If necessary:
- Changing batteries, page 38.

Every six months:
- Check calibration, page 40.

Storage

- The Alcotest® 6510 consumes a small amount of current even when switched off. Therefore remove the batteries from the instrument during long periods without use.

Note: In case of long storage periods
Remove batteries from instrument, if the instrument is not used for more than 6 months to avoid damage to the instrument caused by leaking battery acid.

Caution:
Used alkaline batteries must not be thrown into open fire, be recharged or opened by exerting force. Danger of explosion!

– Only dispose of as special waste in accordance with local waste disposal regulations.

For more information about suitable waste disposal companies please contact the local authorities for environmental protection.

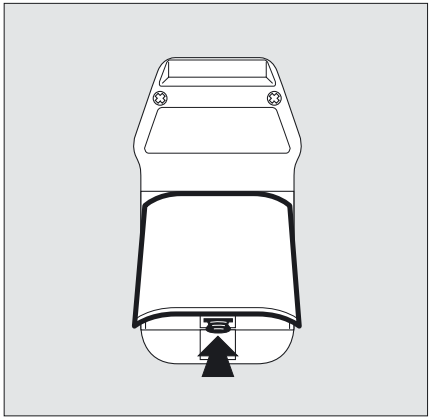
Cleaning

- Do not submerge in liquid – liquid must not enter the sockets!

To clean:

- wipe with a disposable tissue.
- do not use cleaning agents containing alcohol or solvents.

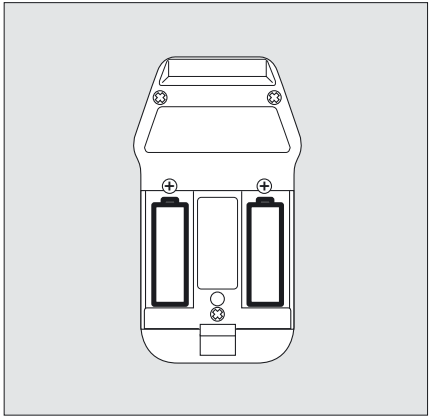
Changing batteries



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If the battery symbol on the display indicates "empty" , change the batteries.

Gently press onto the lock of the battery compartment and remove cover.



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Remove used batteries and insert new ones – consider correct polarity.

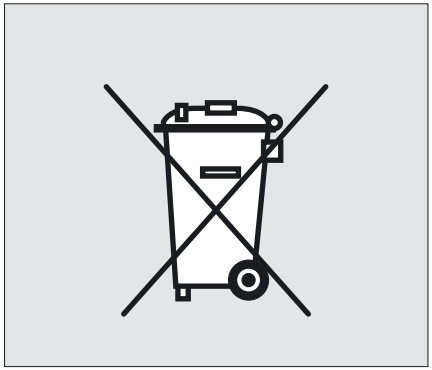
Close battery cover.

Required batteries:
2 each 1.5 V Type Alkaline (Mignon, LR6, AA)

or

rechargeable battery 2*1.2 V NiMH

— For continuity of use it is recommended always to have replacement batteries or an additional battery supply available.



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Caution:
Used batteries
— **Do not expose to fire,**
— **Do not recharge,**
— **Do not force open. Danger of an explosion!**

Only dispose of as special waste,
in accordance with local waste disposal regulations.
Information can be obtained from environmental agencies and from waste disposal companies.

Kalibrierung

– nur durch befugte Personen
– empfohlene Kalibrierung alle 6 Monate
– unter dem Menüpunkt **"Letztes Kal. Datum"** kann das letzte eingegebene Kalibrierdatum eingesehen werden.

Vorbereitende Maßnahmen

- Im Hauptmenü **"Kalibrierung"** aufrufen und den Menüpunkt "Optionen" wählen.
- Im Menüpunkt **"Optionen"** den **"Sollwert"**, den **"Gastyp"** und die **"Höhe ü. NN"** einstellen.

Hinweis:
Die Einstellungen von Gastyp und Höhe ü. NN sind nur für die Kalibrierung von Bedeutung.

Kalibrierung mit dem Dräger-Mark II Simulator
Gebrauchsanweisung des Simulators beachten.
Simulator für den Betrieb vorbereiten.
Mundstück des Alcotest® 6510 über Adapter mit dem Auslass des Simulators verbinden. Zur Vermeidung von Kondensation darf die Verbindung nicht länger als 5 cm sein.

Kalibrierung mit Trockengas
Alcotest® 6510 über einen Schlauch (maximale Länge 1 m) mit Prüfgasflasche verbinden.

Calibration

– only by authorized personnel
– calibration recommended every 6 months
– in sub-menu item **"Last cal. date"** the calibration date last entered can be viewed.

Preparation measures

- Call up **"Calibration"** in the main menu and select menu item **"Options"**.
- Set the **"Setpoint"**, the **"Gastype"** and the **"Altitude"** in menu item **"Options"** .

Note:
The settings of gas type and height above the sea level are important only for the calibration.

Calibration using the Dräger-Mark II Simulator
Follow instructions for use of the simulator.
Prepare simulator for operation.
Connect Alcotest® 6510 mouthpiece via adapter with the simulator outlet. To avoid condensation the connection must not be longer than 5 cm.

Calibration with dry gas
Connect Alcotest® 6510 with test gas bottle via a hose (maximum length 1 m).

Durchführung
Durchführung der Kalibrierung wie im Menü auf Seite 33 beschrieben.

- Nach erfolgreicher Kalibrierung ist ein Kalibrier Test über den Menüpunkt "**Kalibrier-Test**" durchzuführen.

- Die Einstellungen Gastyp und Höhe ü. NN bleiben wirksam.

Das Ergebnis des Kalibrier-Tests ist mit dem Sollwert zu vergleichen.

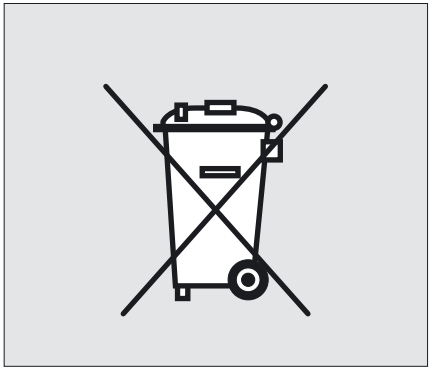
Procedure
Procedure as calibration described in the menu on the page 33.

- After successful calibration an "**Accuracy check**" for testing the instrument must be performed.

- The settings gas type and altitude remains.

The result of the accuracy check shall be compared with the set point.

Disposal of the instrument



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– at the end of its service life.

- Dispose of the instrument in accordance with national waste disposal regulations or
- Ask a suitable disposal contractor to dispose of the instrument.
  The local environmental agency can supply further details.

Fault	Cause	Remedy
Instrument switches off automatically.	batteries discharged.	replace batteries, page 38.
	Instrument has been left ready for measurement for more than 4 minutes.	
Instrument leaves menu-mode automatically and shows measuring mode.	Instrument has an automatically switch off of the menu after 120 sec. without use.	Reselect menu item.
Instrument cannot switched on.	batteries discharged.	Replace batteries.
Insuffient volume, Blowing interruption.	Testperson not blowing hard or evenly enough.	Ask to blo harder and more evenly.

Fault in display	Cause	Remedy
"**Calibriation error**"	Calibration not successful.	Calibrate again, by trained service personnel, e. g. by DrägerService.
"**Accuracy check error**"	Accuracy check not successful.	Repeat accuracy check, if fault reappears, call DrägerService.
↑ ↑ ↑	BAC measured exceeds measuring limits.	Use lower concentrations.
"**Internal System ERROR**" with service code	Instrument error, no measuring function possible.	Remove batteries (2 sec.) and insert them again, if the fault reappears call DrägerService.

Technical data

Measuring principle	Electrochemical sensor
Measurement range	
Breath alcohol concentration	0.00 bis 2.5 mg/L 0 bis 2500 µg/L 0.000 bis 0.500 g/210L 0 to 250 µg/100mL 0 to 250 µg% (Ethanol-Mass per breath volume at 34 °C and1013 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

Display range is identical to measuring range.
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 measurement volume the higher volume is valid
up to 1.00 ‰	0.017 ‰
≥ 1.00 ‰	1.7 % of measurement volume the higher volume is valid

Values for other measuring units can be calculated according to page 45.

Sensitivity drift typically 0.6 % of meas. value/month

Intervals before readiness for operation

1st measurement about 6 s

after terminating a result of a previous test in range:
(breath alcohol unit)

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 terminating a result of a previous test in range:
(blood alcohol unit)

0.50 ‰	20 s
1.00 ‰	40 s
2.00 ‰	80 s
> 3.00 ‰	120 s

Intervals for other measuring units selected can be calculated accordingly (page 45).

Calibration

Calibration interval	depends on required accuracy, typically: 6 month

Permissible calibration range for unit of measuring value:

mg/L	0.160 to 0.750 mg/L
µg/L	160 to 750 µg/L
g/210L	0.035 to 0.150 g/210L
µg/100 mL	16 to 75 µg/100 mL
µg%	16 to 75 µg%
‰	0.35 to 1.50 ‰
%	0.035 to 0.150 %
g/L	0.35 to1.50 g/L
mg/100 mL	35 to150 mg/100 mL
mg%	35 to 150 mg%
mg/mL	0.35 to 1.50 mg/mL

Standard calibration value when using Dräger Ethanol-Standard solution for unit of measuring value:

mg/L	0.476 mg/L
µg/L	476 µg/L
g/210L	0.100 g/210L
µg/100 mL	47.6 µg/100 mL
µg%	47.6 µg%
‰	1.00 ‰
%	0.100 %
g/L	100 g/L
mg/100 mL	100 mg/100 mL

The use of these standard calibration values corresponds to a conversion factor of 2100 between breath and blood alcohol concentration-values.

Dimensions	140 mm x 80 mm x 35 mm (W x H x D)
Weight	approx. 195 g
Electrical supply	
Batteries	2 x 1.5 V Type Alkaline (Mignon, LR6, AA) approx. 1500 measurements
CE-marking	electromagnetic compatibility (Directive 89/336/EEC)

Order list

Name and Description	**Part no.**
Alcotest® 6510 (instrument, 3 mouthpieces, 2 batteries, hand strap and case)	**83 17 900**
Accessories	
Mouth-pieces hygienically tested	
100 pieces	**68 10 690**
250 pieces	**68 10 825**
1000 pieces	**68 10 830**
Alkaline battery (1 piece)	**13 35 804**
Rechargable battery NiMH (1 piece)	**83 179 12**
Case for Alcotest® 6510	**83 179 20**
Leather pouch for Alcotest® 6510 (belt fixation)	**83 17 911**
Leather pouch for Alcotest® 6510 (yellow) (Instrument can be operated while staying in the pouch)	**83 17 931**
Calibration accessories	
Mark II Simulator	**45 40 088**
Ethanol, standard solution 1.0 ‰ (1 x 500 mL)	**67 28 838**
Calibration set	**83 17 927**
Calibration gas, ethanol-nitrogen	on request

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