Alcotest® 6820
Technical Manual
Version 1.0

Dräger. Technology for Life®

Table of Contents

1   For your safety

1.1   General safety statements

- For correct and effective use of the described instrument it is essential to read and strictly follow the instructions contained in this document.
- The instrument is only to be used for the purposes specified herein.

1.1.1   Maintenance

Repairs of the described instrument may only be performed by Draeger Safety Diagnostics, Inc. or an authorized service technician, and only Draeger spare parts may be used. Otherwise the proper functioning of the device may be compromised.

1.1.2   Note

In this document the Dräger Alcotest® 6820 is also referred to as the "6820".

1.2   Definition 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:

> ⚠ **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 describe unsafe practices to be avoided.

> ℹ **NOTICE**
>
> Indicates additional information regarding the device.

2   Copyright and legal disclaimer

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Draeger Safety Diagnostics, Inc.
4040 W. Royal Lane, Suite 136
Irving, TX 75063
Phone: (972) 929-1100
Fax: (972) 929-1260

www.draeger.com

2.1   Disclaimer

The authors of this manual have incorporated their best efforts in preparing this information and ensuring that the technical content is completely accurate at the time of publication.

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3   Product Overview

3.1   General

The Dräger Alcotest® 6820 is a preliminary breath tester used for breath alcohol measurements. The 6820 provides breath alcohol concentration results and displays them on the screen.

3.2   Instrument
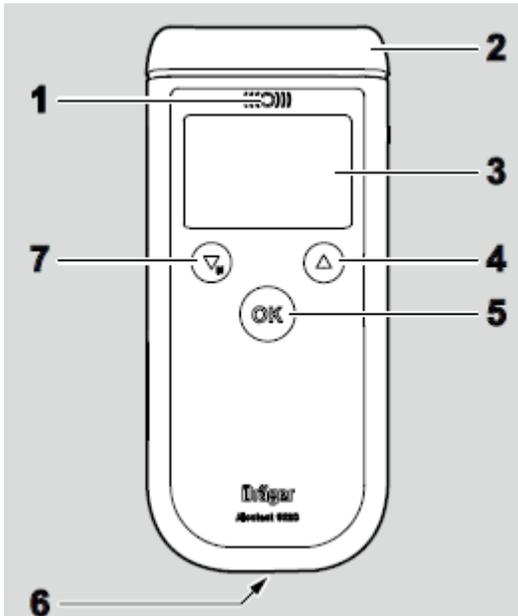
1. Indicator Light and Optical Interface
2. Mouthpiece Receptacle
3. Display
4. Up Arrow Button
5. OK Button
6. Interface Connection
7. Down and Menu Button

3.3   Intended Use

The 6820 is used to quickly measure a subject's breath alcohol concentration by analyzing a collected breath sample.

4   Preparation for Use

4.1   Batteries

Change the batteries in the instrument when the indicator shows that they are nearly 'empty'.

Turn the lock on the battery cover and remove it. Remove the discharged batteries and replace with new ones. Note that unlike many other battery-operated devices the batteries are both placed in the instrument facing the same way.
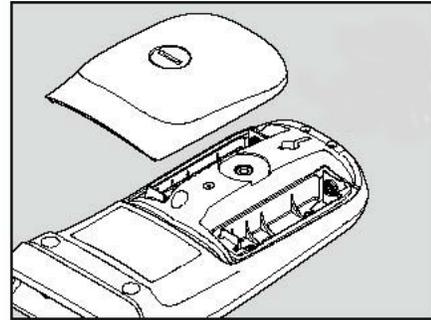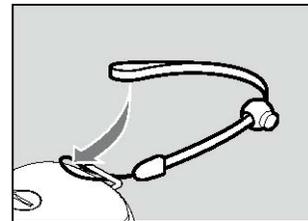

Close the battery cover.

The instrument uses two AA batteries.

4.2   Hand Strap

Insert the smaller loop into the hole in the housing. Thread the longer loop through the smaller loop and pull it through.
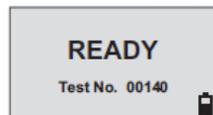
5 Performing a Breath Test

5.1 Turning the Instrument On and Off

5.1.1 Turning the Instrument On

Press the "OK" button for about one second until the start window is displayed. The instrument performs a short self-test right after starting up. It then goes to the Ready state.

5.1.2 Turning the Instrument Off

Press and hold the "OK" button for about two seconds and the instrument will shut off.

The instrument will shut itself off if four minutes pass with no activity.


5.2 Conditions for Testing

Make sure the following conditions are met when performing a breath test. These conditions ensure the test is accurate:

- Use a new mouthpiece for each subject.
- Do not unnecessarily introduce high mouth alcohol concentrations as this reduces the life of the fuel cell.
- Do not test the subject within 15 minutes of their drinking any alcoholic beverages or putting any alcoholic substance in their mouth. Observe the 15 minute deprivation period.
- Ensure the subject breathes normally before giving the breath sample.
- The subject must blow a minimum of 1.2 liters of breath and blow for at least 2 seconds.

5.3 Fitting the Mouthpiece

1. Open the packaging. To maintain hygienic conditions keep the portions of the mouthpiece that will come in contact with the subject's mouth covered by the packaging until the mouthpiece is attached to the instrument.

2. With the grooved markings facing up press the mouthpiece into the receptacle until it snaps into place. Remove the rest of the packaging.
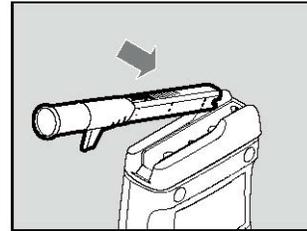
5.4 Collecting the Breath Sample

When the instrument is ready to test the instrument displays READY along with a unique test number.
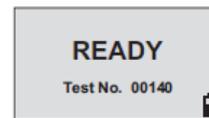
Ask the subject to blow evenly into the mouthpiece without interruption until the tone stops. A strong steady breath is what you want.

Once the subject starts to blow a tone will sound and the display will show "Blow".

When the tone stops the instrument has completed the test and displays will show "Analyzing".
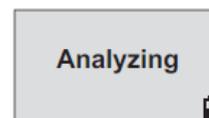
Within seconds the result appears on the display.

If you wish to print the results using the Dräger Mobile Printer see Section 9.

Press the "OK" button to exit the results screen and the instrument will prepare for the next test with a countdown showing how many seconds are left before it is ready to collect another breath sample. The time will vary depending on the alcohol concentration of the last test.

Note that turning off the instrument and turning it back on will not reduce the waiting period.

5.5 Test Errors

5.5.1 Insufficient Volume

If the sampling volume is too small the device will beep and the red light will flash. The display will show:

Press the "OK" button and wait for the instrument to reach ready status again. Instruct the subject to take a deeper breath.

5.5.2 Blow Interruption

If the subject exhales improperly by inhaling in the middle of the test or abruptly ending the blow before the sample is collected the device will beep and the red light will flash. The display will show:

Press the "OK" button and wait for the instrument to reach ready status again. Instruct the subject to blow steadily.

5.6 Removing the Mouthpiece

Remove the mouthpiece by pushing upward on the ejector tab. Dispose of used mouthpieces in a hygienic manner.

5.7 Passive Sampling

Passive sampling is used to test the ambient air. This mode only detects whether alcohol is present. It does not give a concentration.

To collect a sample hold the instrument without a mouthpiece into the air to be analyzed and press the "OK" button shortly. The instrument displays the results.

5.8 Manual Sampling

Manual sampling is used when the subject cannot blow the required minimum volume and/or time required for a breath sample. To take a manual sample instruct the subject to blow normally and when the subject is about to stop press the "OK" button. The instrument will analyze the sample and display the results and display "Manual" below the results.

6 Menu

6.1 Navigating the Menu

Press the down arrow/Menu button while on the Ready screen to access the menu.

Use the arrow buttons to navigate the menu and the "OK" button to make a selection.

Select "Back to measurement" to exit the menu. While within an option select "Back to menu" to return to the menu.

If no button is pressed for two minutes while in the menu the instrument automatically returns to measuring mode.

6.2 Menu Options

The menu is configured with these options.
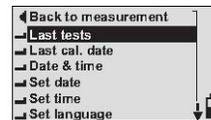
6.2.1 Last tests

Use the arrow buttons to navigate through the tests in memory. The tests display in sequential order. The instrument keeps the last ten tests taken in memory.

6.2.2 Last cal. date

This option displays the date of the last calibration performed on the instrument and the date of the last accuracy check performed on the instrument.

6.2.3 Date & time

Displays the current date and time recorded in the instrument.

6.2.4 Set date

Allows you to alter the date and the date format used in the instrument.

6.2.5 Set time

Allows you to set the time recorded in the instrument and to turn on and off daylight's savings time.

6.2.6 Set language

Allows you to select one of the four languages programmed into the instrument (English, German, French, Spanish).

6.2.7 Set contrast

Allows you to adjust the contrast of the display.

6.2.8 Accuracy Check

Allows you to perform an Accuracy check (see Section 8).

7 Advanced Menu

To access the advanced menu you need a PIN. Press and hold the down arrow/Menu button until the advanced menu comes up. Select Enter PIN to continue.

Use the arrow keys to select the digits for the PIN. Press the OK button when the correct digit is chosen. Enter all four digits this way.

Navigate through the menu using the arrow keys. Use the OK button to make a selection.

7.1 Information

7.1.1 Last tests

Use the arrow buttons to navigate through the tests in memory. The tests display in sequential order. The instrument keeps the last ten tests taken in memory.

7.1.2 Last cal. date

This option displays the date of the last calibration performed on the instrument and the date of the last accuracy check performed on the instrument.

7.1.3 Configuration

This option allows the user to view the device configuration. This includes the display mode, the measurement unit, the thresholds for passing and failing a test, and the measurement unit used.

7.1.4 Test number

This displays the unique test number that will be assigned to the next completed test.

7.1.5 Date & time

Displays the current date and time recorded in the instrument.

7.1.6 Device information

Displays the part number and serial number of the instrument.

7.1.7 Software version

This displays the device's part number and the version of the firmware currently installed in the device.

7.2 Settings - Instrument

7.2.1 Set language

This option allows you to toggle the language used by the device. (default: English)

7.2.2 Display test number

This toggles whether the test number is displayed when test results are shown. (default: On)

7.2.3 Set contrast

This option allows the user to alter the display contrast. (default: 30)

7.2.4 Set date

Allows you to alter the date and the date format used in the instrument.

7.2.5 Set time

Allows you to set the time recorded in the instrument and to turn on and off daylight's savings time.

7.2.6 Test reason code

Switch on or off the test reason (default: off)

7.2.7 Device info. screen

Toggles on and off device information appearing when you turn the instrument on or off and adjust what information appears.

7.2.8 User info. screen

Toggles the user information screen on and off.

7.2.9 Change PIN

This option allows the user to alter the PIN number for the device.

7.3 Settings - Measurement

7.3.1 Display Mode

This option allows you to toggle how test results are displayed. You can choose:

Result - displays the measurement recorded
PAF - which shows Pass, Alert, or Fail
PF - which shows Pass or Fail
ZPWF - shows Zero, Pass, Warning, or Fail.
(default: Result)

7.3.2 Measurement unit

This option allows you to select the measurement unit the device will calculate from. (default: %)

7.3.3 Result Resolution

This option allows you to select High or Low result resolution. High resolution displays the result out to three digits beyond the decimal. Low resolution displays it out to two. (default: High)

7.3.4 Sample Mode - Auto-Sample

This option allows you to toggle when the device will finish taking a breath sample. You can choose a fixed volume to end the test or allow the instrument to detect when the breath is nearly complete. (default: End of Breath)

7.3.5 Sample Mode - Additional

This option allows you to select which alternative sampling modes are available. You can activate or deactivate passive and manual sampling (see 5.7 and 5.8). (default: Both on)

7.3.6 BAC limits

This option allows you to set the thresholds for Pass/Alert/Fail concentrations levels. (default:0.050%Pass, 0.080% Alert, 0.150% Fail)

7.3.7 Blow criteria

These settings can be altered to change the minimum required volume for a breath sample and the minimum blow time for a successful breath test. (default: 1.2 Liters and 2.0 seconds)

7.4 Calibration

7.4.1 Last cal. date

This option displays the dates of the most recent calibration and the most recent accuracy check.

7.4.2 Options - Setpoint

This option allows you to change the calibration value and the check value. These are used when performing an accuracy check or calibration. (default: 0.100% for both)

7.4.3 Options - Gas Type

Allows you to select dry gas or wet bath as the method used for accuracy checks and calibrations.

7.4.4 Options - Altitude

This option allows you to set the altitude and the unit in which altitude is measured. These values must be accurate for dry gas calibrations and accuracy checks to work correctly. (default: 0 ft)

7.4.5 Calibrate

Use this option to calibrate the instrument. This operation should only be performed by authorized service personnel trained to calibrate the instrument. Contact Draeger Safety Diagnostics.

7.4.6 Accuracy check

Use this option to perform an accuracy check. See 8.2

7.4.7 Set last cal. date

This option is used to manually update when the device was last calibrated.

7.4.8 Set last chk date

This option is used to manually update when the last accuracy check was done.

8 Dry Gas Accuracy Check

8.1 Preparation

Before performing a dry gas accuracy check make sure that dry gas is enabled in the pin-protected menu. Verify the gas concentration is equivalent to the set point specified in the pin-protected menu. Attach a regulator to the dry gas cylinder and a mouthpiece to the device.

8.2 Performing Check

Select Accuracy Check from the menu. When the display reads "Supply Gas" press down on the button on top of the regulator. The device will beep. Continue to hold the button down until the beep stops.

8.3 Results

After the check is complete the device will show the check value and the result value. The result value must be within 0.005 above or below the check value. If the value fits within these parameters the check is passed.

If the check fails then call Draeger Safety Diagnostics to get assistance.

9   Printer Operation

9.1   Operating the Printer

To turn the printer on press and hold the green button until the printer beeps and turns on.

9.2   Printing Results

To print the results of a breath test align the optical ports of the 6820 and the printer while the result is on the display. The printer will automatically print the results.

To print the results of a previously completed test find the test in the menu (see Section 6). When the test result is displayed align the optical ports to print the results.

10   Maintenance

10.1   Storage

The instrument uses a small amount of power even when shut off. Remove the batteries if the instrument will be out of use for longer then a few months.

10.2   Cleaning

Do not submerge in liquid to clean the instrument or for any other reason.

Clean the instrument by wiping it with a disposable tissue. Do not use any cleaning agents containing alcohol on the instrument.

10.3   Calibration

Calibrations can only be done by trained and authorized personnel. Do not perform a calibration unless you have been trained to do so.

The manufacturer recommends having your instrument calibrated annually. You should also send the device for calibration if the accuracy check fails.

Use the menu to find the last calibration date for the instrument.

10.4   Internal System Errors

If the instrument displays that there is an Internal System Error then turn the instrument off and remove the batteries for several seconds. Replace the batteries and power the instrument back on.

If the error still persists call Draeger Safety Diagnostics for assistance.

11 Troubleshooting

Fault	Cause	Remedy
Instrument switches off unintentionally.	Batteries are low or the instrument was automatically shut off after 4 minute wait time.	Replace batteries
Instrument leaves menu-mode automatically and shows measuring mode.	The menu automatically returns to measuring mode after 120 seconds.	Reselect menu item.
Instrument cannot be switched on.	Batteries are low.	Replace batteries.
No text in the display.	Instrument error.	Remove batteries (at least 2 sec.) and insert them again, if the fault reappears call Draeger Safety Diagnostics.

Fault in display	Cause	Remedy
Calibration error	Calibration was not successful.	Calibrate again (only by authorized service personnel).
Accuracy check error	Accuracy check was not successful.	Repeat accuracy check, if fault reappears, contact DSDI.
↑↑↑	Measured BAC exceeds measuring range.	Wait 15 minutes and then perform the test again. The only way a conscious human can exceed the measuring range is with copious amounts of mouth alcohol.
Internal System ERROR	Instrument error, no measuring function possible.	Remove batteries for a few seconds and replace them. If the error message reappears, contact Dräger.

12   Technical Data

Measuring Principle: Electrochemical Sensor

Measuring Range: 0.000 to 0.500% BAC

Ambient Conditions: 23 to 122° F, 10 to 100% r.h.

Sample Minimums: 2 seconds and 1.2 liters

Electrical Supply   2 AA Alkaline or NiMH

Interval between Tests: 6 sec min. 120 sec max.

Instrument Dimensions: 2.5" x 6" x 1.5"

Weight: approximately 0.5 lbs.

Calibration Interval: Recommend every 365 days