User manual

airLPT216

Air leakproof tester

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Operating instructions

Air leakproof tester (airLeakProofTester 216)
airLPT216

Version 1.2 Dated 07 March 2017

An air leakage test on air conditioning systems is necessary to check for compliance with the required air tightness class and thus the airtightness of the ductwork system. The relevant standard on which ventilation and air conditioning systems are based is EN 13779 "Ventilation for non-residential buildings – Performance requirements for ventilation and room-conditioning systems".

Leaking ventilation systems consume unnecessary energy. The more airtight the ducting the higher the energy savings. Furthermore, leaking systems can have negative effects on hygiene. Lack of air flow rate in the destination due to leakages can have negative effects on the room conditions.

The airLPT216 air leakproof tester is used to determine the quantity of air leaked and the air tightness class achieved according to EN 13779, or EN 1507 and EN 12237, especially in HVAC systems. Due to the automatic determination of the air tightness class there are a wide range of applications from very small systems (7 m^2 surface area) through to large systems.

The airLPT216 air leak proof tester, with its complete equipment and integration in a stable plastic case, has been especially designed for use on construction sites. It weighs less than 9.5 kg and is therefore light and easy to transport. The hoses and accessories are handily packed in a stable plastic case.

Clear and user-friendly menu navigation makes the device easy to operate. It is suitable for positive and negative pressure tests. All connections, the display and the thermal printer are clearly arranged on the top. The air hose connection for the negative pressure measurement is at the side.

The automatic measurement sequence to EN 1507 and EN 12237 lasts 5 min. The air duct system to be tested is sealed off airtight from the rest of the system. It is pressurised, the test pressure is controlled automatically and is kept constant (as defined by the standard +/- 5 %) and the leakage air rate is determined. The measurement record is printed out using an integrated thermal printer or the data is transferred to a USB stick.

You are interested in further technical data and details of the airLPT216 air leak proof tester?
Then visit our website www.airleben.de or call us on +49 3621 51445-0, we will be happy to advise you.

GENERAL INFORMATION

General notes

These operating instructions enable you to use the airLPT216 air leak proof tester safely and reliably. Read through these operating instructions and keep them in a safe place.

Intended use

The airLPT216 air leak proof tester may only be used by competent personnel and only for its intended use. It has been design for air leakage testing of air duct systems, especially in HVAC systems, and its intended use is as a measuring device.

It is used to determine the quantity of air leaked and the air tightness class achieved in HVAC systems according to EN 13779, or EN 1507 and EN 12237. Due to the automatic determination of the air tightness class there are a wide range of applications from very small systems (7 m² surface area) through to large systems.

In addition to the measuring function, the measuring device can also pressurise the connected system to test pressure (positive pressure) for a defined time. This function is intended for leakage detection. Continuous leakage detection may only be carried out in Leak Detection mode.

The airLPT216 air leak proof tester may only be used for the applications described above.

The user must prevent any use that is not intended use. The test lines may only be pressurised with the maximum positive or negative pressure for which they have been designed. The airLPT216 air leak proof tester is explicitly not intended for performing test tasks in which the connected test object is expected to be destroyed due to positive or negative pressures.

Before performing the test, the mechanical strength of the system to be tested must be checked. In par-

ticular, system parts that are not fixed or are partly fixed, e.g. an unriveted end cover, can come off suddenly during the test sequence and can cause serious injuries, consequential damage and damage to the airLPT216 air leak proof tester.

The device should be transported, stored and used in a dust-free and dry environment. Avoid getting dirt (e.g. dust, moisture) on the connections for the air and pressure measuring hose.

In case of positive pressures higher than 2,000 Pa, the two measurement connections - air connection, pressure measurement connection - must be additionally secured against coming off suddenly at the measurement openings.

The device should never be opened by the user.

Caution! Risk of fatal electric shocks at 230 V, 50 Hz!

The device may only be opened by a competent person. If the device does not work, follow the instructions in the "Troubleshooting" section or contact the manufacturer.

Changes to the original condition of the device are not permitted.

All personal injuries and material damage caused by any use that is not intended use or due to disregard of these operating instructions are the sole responsibility of the user of the device and not the manufacturer.

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www.airleben.de

Important note on disposal
Electronic devices must not be disposed of in household waste, but in accordance with the relevant environmental regulations. Damaged rechargeable batteries are hazardous waste and must be handed in to the collection points provided for disposal.

Explanation of the symbols used

 Electrical hazard - This symbol warns of the hazards of electricity and dangerous voltage.

 Attention / Important - This symbol indicates important notes on proper handling of the technology.

 Quick start guide – The fast route to use of the air leak proof tester.

TECHNICAL DATA

Technical data

· 4-line illuminated display
· Power supply: 230 V / 50 Hz
· Power consumption: max. 1,900 W
· Weight: approx. 9.5 kg
· Dimensions (L/W/H): 440 mm x 370 mm x 253 mm
· Working range: +5 to +50 ˚C
· Storage temperature: -20 to +50 ˚C
· Working range: 0.08 - 36 l/s; 0.29 - 130 m^3/h
· Air tightness classes to EN 1507: Class A / Class B / Class C / Class D
· Air tightness Class Z
· max. test pressure: -3,500 Pa / + 6,500 Pa
· Pressure measurement
    · Ceramic measuring cell for differential pressure measurements for -3,500 to +6,500 Pa
    · Resolution 1 Pa
    · Max. total error 1.5 % of the FS
· Volume flow measurement
    · Mass flow rate measurement according to the calorimetric measuring principle
    · within the measurement range 0.08 to 36 l/s
    · Resolution 0.01 l/s

Equipment / scope of supply

· 1 airLPT216 air leak proof tester integrated in the plastic case
· 1 plastic transport case for accessories
    · 1 mains cable 230 V AC (3 m long)
    · 1 air hose (5 m long) with couplings for connection to the tester and to the air duct system to be tested
    · 1 hose (10 m long) for pressure measurement, with couplings for connection to tester and to the air duct system to be tested
    · 2 spare paper rolls for record printer
    · 1 operating instructions/calibration record
    · USB stick

Note:
Changes to the technical data and available accessories for the product can occur at any time as part of further technical development.

CONTROLS

Controls

1. Side flap
2. Mains connection (power connection)
3. Device fuse
4. Mains switch
5. Display
6. USB port (max 4 GB)
7. Air hose
8. Positive pressure air connection
9. Negative pressure air connection
10. Pressure measuring hose with removable adapter
11. Pressure measurement connection
12. Record printer

Startup

The corresponding mains connection cable (power cable) is used to connect the airLPT216 air leak proof tester to the electrical system (230 V, 50 Hz) and the device is switched on at the mains switch **(4)**.

⚠ **Open the side flap (1) on the right-hand side of the device.** ⚠

K

There you will find the mains connection for the power cable and the device fuse

2 Mains connection

3 Device fuse

After switching on, the display **(5)** shows the company name, name of the device, hardware and software version and the number of tests performed since the last inspection.


```
        airleben
       airLPT 216
    HWV 1.0 SWV 1.3
      Tests: 487
```

F1 F2 F3   Arrow buttons ↑ and ↓
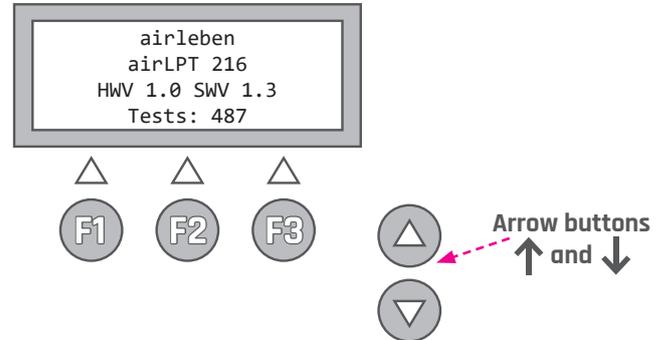
After three seconds the device signals on the display **(5)** that internal tests (device self-tests) are being performed.

In detail, these are:
1. Display test (visual only)
2. Test of the backup battery of the realtime watch (clock) with warning if a battery change is required
3. Program memory test
4. Parameter memory test
5. Button test (possibly jamming buttons)
6. USB port test
7. Flow sensor test for compliance with the signal limits
8. Differential pressure sensor test for compliance with the signal limits
9. Brief starting up of the compressor (fan)
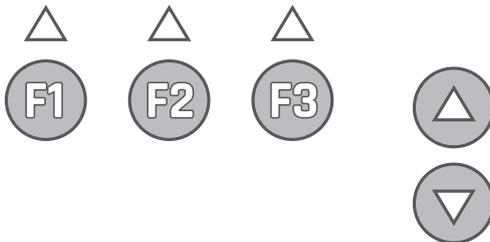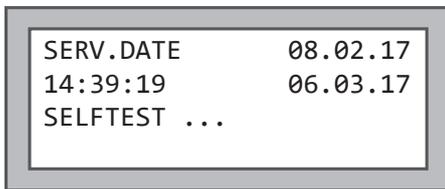
The display **(5)** then shows information on whether all internal tests have been passed, or shows a corresponding error message. In case of fatal errors (errors 3, 4, 5, 7, 8, 9), the device cannot be used, or only to a limited extent, and must be handed in to the servicing or sent to the manufacturer's factory for repair. (See also "Troubleshooting" section on page 60)

A test is also performed on the USB drive **(6)**, whereby it does not matter whether a USB stick is plugged in or not.
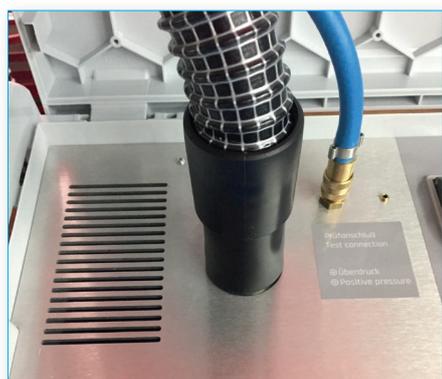If an error occurs, a warning appears on the display

(5) for 3 s. This error is NOT a fatal error, so that the device can continue to be operated; however, without the option of reading data onto the USB stick and saving it.

The USB stick must not have a storage volume greater than 4 GB, as otherwise complications can occur with the software. We recommend that you use the USB stick supplied by us with the device.

POSITIVE PRESSURE MEASUREMENT

Connect the air hose **(7)** for a positive pressure measurement to the positive pressure air connection **(8)** on the top of the device. Turning the hose coupling slightly makes it easier to push on.

K

7

10

Connect the pressure measurement hose **(10)** to the top of the device, at the pressure measuring connection **(11)**. Connect both hoses to the measurement connections on the air duct system to be tested.

These should be approx. 1.5 – 2 m apart and not be opposite each other.

⚠️

In case of pressures higher than 2,000 Pa, the two measuring connections (air connection, pressure measuring connection) must be additionally secured against coming off suddenly.

⚠️

The hoses must not be kinked, crushed or twisted.

The ductwork surface to be tested should be at least 10 m^2 for testing in conformity with the standards and must be determined to EN 14239. The air duct system to be tested must be sealed off airtight from the remaining system. Ensure careful sealing. Avoid using film and adhesive tapes to close off the openings, as in most cases this results in too large measurement errors. The openings must be closed off properly, e.g. using end caps. The air leakproof tester is connected via prepared measuring openings. These can be, e.g. flanged spigots, or inspection openings with appropriate adapters. According to EN 12599, the test pressure, as positive pressure for supply air ducts and negative pressure for exhaust air ducts, should be 200 Pa, 400 Pa or 1,000 Pa and lie in the middle of the average operating pressure.

NEGATIVE PRESSURE MEASUREMENT

Connect the air hose **(7)** for a negative pressure measurement to the negative pressure connection **(9)** on the right-hand side of the device. Turning the hose coupling slightly makes it easier to push on.

K

Connect the pressure measurement hose **(10)** to the top of the device, at the pressure measuring connection **(11)**. Connect both hoses to the measurement connections on the air duct system to be tested.

These should be approx. 1.5 – 2 m apart and not be opposite each other.

In case of pressures higher than 2,000 Pa, the two measuring connections (air connection, pressure measuring connection) must be additionally secured against coming off suddenly.

The hoses must not be kinked, crushed or twisted.

The ductwork surface to be tested should be at least 10 m² for testing in conformity with the standards and must be determined to EN 14239. The air duct system to be tested must be sealed off airtight from the remaining system. Avoid using film and adhesive tapes to close off the openings, as in most cases this results in too large measurement errors. The openings must be closed off properly, e.g. using end caps. The air leakproof tester is connected via prepared measuring openings. These can be, e.g. flanged spigots, or inspection openings with appropriate adapters. According to EN 12599, the test pressure, as positive pressure for supply air ducts and negative pressure for exhaust air ducts, should be 200 Pa, 400 Pa or 1,000 Pa and lie in the middle of the average operating pressure.
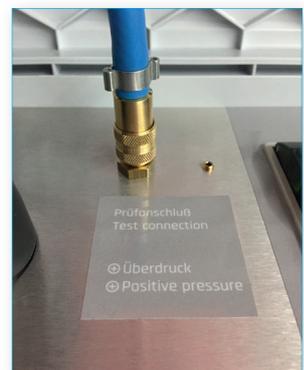
OPERATION

Main menu

After the device self-tests have been completed successfully the Main menu is displayed. The following possible modes appear on the display:

- Automatic test mode
- Manual test mode
- Leak detection mode
- Setup mode

The menu used for previous operation of the device is indicated by an arrow. If it is to be used again, it is sufficient to press the ENTER button. Otherwise use the arrow buttons ↑ and ↓ to select another menu.

```
→ AUTOMATIC TEST
  MANUAL TEST
  LEAK DETECTION MODE
              [ENTER]
```
△ F1   △ F2   △ F3
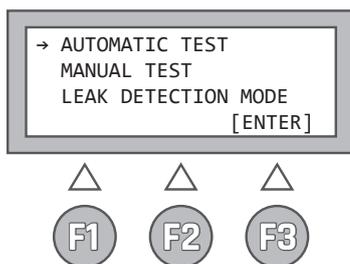
Automatic test mode (as per EN 1507 and EN 12237)

K

The saved input parameters of the preceding test are shown on the display as follows

```
→ CLASS          B
  TEST PRESS.  400 Pa
  SURFACE      20.0 m2
[MAIN | CHANGE | START]
```
△ F1   △ F2   △ F3
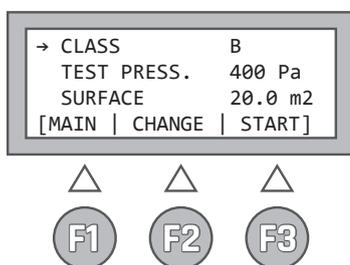
- in line 1   the air leaktightness class A, B, C, D or Z
- in line 2   the test pressure, with "+" for positive pressure and "-" for negative pressure
- in line 3   the air duct surface area

In this menu the buttons have the following labelling and meaning:

F1 - MAIN   Back to Main menu
F2 - CHANGE   Switch to submenus to change the "Class", "Test pressure" and "Surface area" parameters. An arrow in the respective line indicates the menu to which the program switches. The arrow can be moved vertically using the arrow buttons ↑ and ↓.
F3 - START   Start of the test

As the input parameters of the previous test are saved, it is sufficient to press the **START button (F3)**, if a test is to be repeated.

In the CLASS submenu
you can choose between the air tightness classes A, B, C, D or Z.

F2 - CHANGE   Change the "air tightness class"

```
→ CLASS          B
  TEST PRESS.  400 Pa
  SURFACE      20.0 m2
[MAIN | CHANGE | START]
```
△ F1   △ F2   △ F3

```
  CLASS          B



              [ENTER]
```
△ F1   △ F2   △ F3
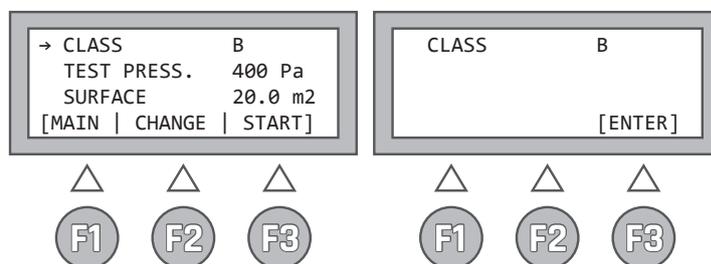
Remark:
Air tightness class Z is an air tightness class that can be freely defined by the user. The corresponding leakage factor is defined in the Setup menu.

In the TEST PRESS. submenu

the arrow buttons ↑ and ↓ can be used to set the test pressure within the limits –3,500 to +6,500 Pa in 5 Pa increments. If the arrow buttons are pressed for longer than 1.5 s, the pressure value changes quickly.

F2 - CHANGE Change the "Test pressure" parameter

```
  CLASS         B
→ TEST PRESS.  400 Pa
  SURFACE      20.0 m2
[MAIN | CHANGE | START]
```
△ △ △
F1 F2 F3

```
TEST PRESS.   200 Pa



              [ENTER]
```
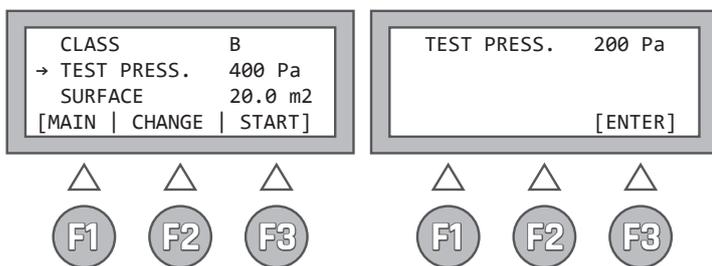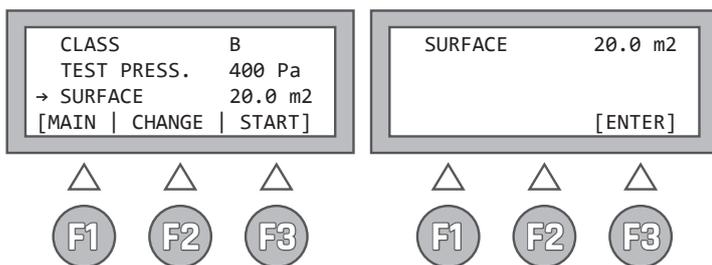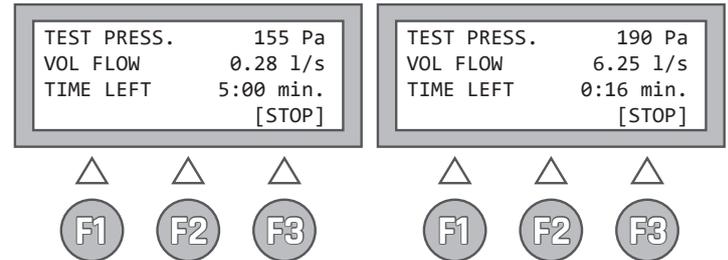△ △ △
F1 F2 F3

In the SURFACE submenu

the arrow buttons ↑ and ↓ can be used to set the surface area between 0.1 and 2,000 m^2 in 0.1 m^2 increments. If the arrow buttons are pressed for longer than 1.5 s, the surface area value changes quickly.

F2 - CHANGE Change the "Surface" parameter

```
  CLASS         B
  TEST PRESS.  400 Pa
→ SURFACE      20.0 m2
[MAIN | CHANGE | START]
```
△ △ △
F1 F2 F3

```
SURFACE       20.0 m2



              [ENTER]
```
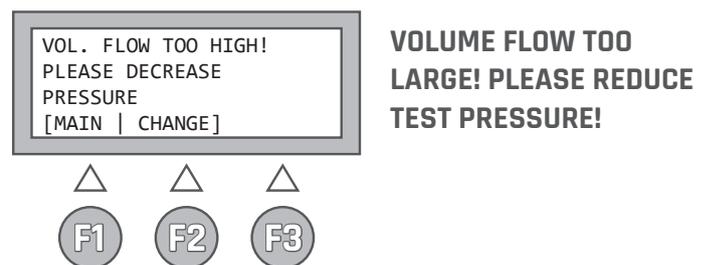△ △ △
F1 F2 F3

Start the test by pressing the **START button (F3)**. The current pressure in Pa and the volumetric flow in l/s (with two decimal places) are displayed continuously. The automatic mode controls the pressure to the pre-

defined test pressure. As soon as it is within +/- 5% accuracy, the actual test time of 5 minutes begins. A counter indicates the remaining test duration. This counter is stopped if the test pressure leaves the above-named tolerance range during the test.

```
TEST PRESS.      155 Pa
VOL FLOW       0.28 l/s
TIME LEFT     5:00 min.
                 [STOP]
```
△ △ △
F1 F2 F3

```
TEST PRESS.      190 Pa
VOL FLOW       6.25 l/s
TIME LEFT     0:16 min.
                 [STOP]
```
△ △ △
F1 F2 F3

The automatic test can be ended prematurely by pressing the **STOP (F3) button**. The measurement period that has passed up to this time is then evaluated. However, no statement is made as to whether the test was passed or not, as it was not performed in conformity with the duration of 5 minutes required in the relevant standard (see EN 1507:2006 Clause 5.22).

If the leakage volume at the set test pressure is above 36.0 l/s, the measurement is cancelled with the following error message:

```
VOL. FLOW TOO HIGH!
PLEASE DECREASE
PRESSURE
[MAIN | CHANGE]
```
△ △ △
F1 F2 F3

VOLUME FLOW TOO LARGE! PLEASE REDUCE TEST PRESSURE!

If the leakage volume at the set test pressure is below the measurement limit of 0.08 l/s, the measurement continues, but a specific measurement value cannot be determined. As a result "Leakage volume < 0.08 l/s" is then output.
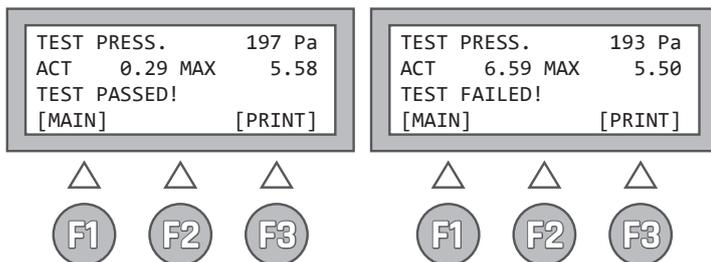
Remark:
The test period is preset to 5 min. (300 sec.). In the Setup menu the test period can be freely set between 30 and 300 sec. in 10 sec. increments.

After the test period has expired the display **(5)** shows the following data:

- average test pressure [Pa]
- average volume flow, i.e. leakage rate [l/s]
- maximum permitted volume flow (leakage rate) as per class and surface area [l/s]
- Test passed (ok) or failed (not ok)

```
TEST PRESS.      197 Pa
ACT    0.29 MAX     5.58
TEST PASSED!
[MAIN]         [PRINT]
```

△ △ △
(F1) (F2) (F3)

```
TEST PRESS.      193 Pa
ACT    6.59 MAX     5.50
TEST FAILED!
[MAIN]         [PRINT]
```

△ △ △
(F1) (F2) (F3)

After ending the test the buttons have the following function:

F1 - MAIN   Back to Main menu
F3 - PRINT   Printout by means of record printer **(12)**.

If the button is pressed again the measured values and the test result are printed out.

```
TEST PRESS.     1000 Pa
ACT    0.53 MAX     0.80
TEST PASSED!
[MAIN | BACK | PRINT]
```

△ △ △
(F1) (F2) (F3)
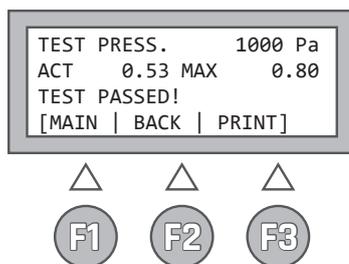
The record can be printed out from this menu as often as required.

K

If the USB stick supplied is in the corresponding drive **(6)**, the record printout is saved on the USB stick as a text file at the same time. The file name is made up of the letters LPT and the 5-digit test number, e.g. "LPT00123.TXT". The date and time when the file was created are saved and are visible, for example, if the files are listed in WINDOWS Explorer. This file is only written on the USB stick once, regardless of how often the paper copy of the record is printed.

RECORD

Contents of the record printout

The record is printed out in the set language (shown here in German).

See also language setting in Setup Mode, page 51.

Record header
It contains seven lines, each with 32 characters, which are freely configurable by the user to display company details.
For details of configuration of these lines, see
"Entering the record header" section.

„LEAKAGE TEST"
"airleben airLPT216" ; "Serial number"; "HW version 1.00" ; "SW version 1.07"
  · Consecutive test numbering since last inspection
  · Date
  · Time

"Air leakage test on air ducts in compliance with standards EN 12237, EN 1507 and EN 12599"

"Data of test objects"
  · Manual or automatic mode
  · Selected air tightness class,
  · Entered surface area [m^2]
  · Target test pressure [Pa]
  · Actually achieved average pressure [Pa]
  · Measuring time [sec]
  · Average leakage rate [l/s] and [m^3/h]
  · Maximum permitted leakage flow rate for the given test pressure and the given surface area in Class A, B, C and D [l/s] and [m^3/h]

If measuring time = 5 min:
         "Test object OK" or "Test object NOT OK"
         this line is printed in twice the text size.
If measuring time < 5 min:
         "Evaluation not possible as test duration was less than 5 min!"
The maximum leakage volume for the four air tightness classes is displayed.

Signature of the tester
Signature of the client

Printout

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Goldbacher Straße 37
D-99867 Gotha
E-Mail: gotha@airleben.de
Internet: www.airleben.de
Tel.: 03621/51445-0
Fax: 03621/51445-219

LUFTDICHTHEITSPRÜFUNG

airleben airLPT216
Seriennummer   2
HW_Version   1.00
SW_Version   1.07

Test-Nummer   504
07.03.2017
07:36:40

Luftdichtheitstest an Luft-
leitungen in Übereinstimmung
mit den Normen
EN 12237, EN 1507 und EN 12599

Testobjekt-Informationen

Prüfung manuell
Luftdichtheitsklasse: B
Prüfungs-Oberfläche: 4,0 m²
SOLL-Prüfdruck: 400 Pa
durchschn. Prüfdruck: 402 Pa
Messdauer: 30 sec
durchschn. Leckvolumen:
          1,62 l/s   5,83 m³/h
zulässig. Leckvolumen:
          1,77 l/s   6,37 m³/h

Prüfung
BESTANDEN

LDK   A: 5,32 l/s   19,15 m³/h
LDK   B: 1,77 l/s   6,37 m³/h
LDK   C: 0,59 l/s   2,12 m³/h
LDK   D: 0,19 l/s   0,68 m³/h

_____
Unterschrift Prüfer

_____
Unterschrift Auftraggeber

OPERATION

Manual test mode
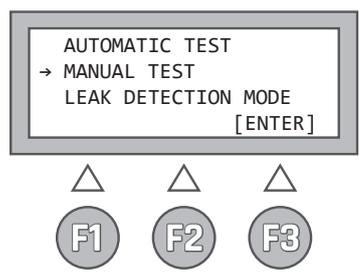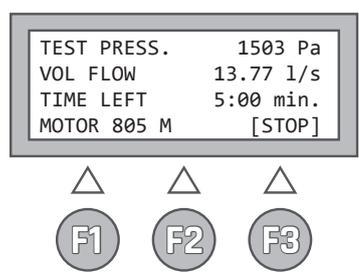
This corresponds to automatic test mode, with the exception that the test pressure must be adjusted manually by changing the fan speed to the entered target value.

```
┌─────────────────────────────┐
│   AUTOMATIC TEST             │
│ → MANUAL TEST                │
│   LEAK DETECTION MODE        │
│                  [ENTER]     │
└─────────────────────────────┘
      △        △        △
    (F1)     (F2)     (F3)
```

After pressing the **Start button (F3)**, the compressor (fan) does not start automatically, but must be adjusted using the arrow buttons ↑ and ↓ to a speed at which the preset pressure is kept within the limits +/- 5 %. If the arrow buttons are pressed for longer than 1.5 s, the compressor (fan) speed changes quickly.

```
┌─────────────────────────────┐
│ TEST PRESS.      1503 Pa     │
│ VOL FLOW        13.77 l/s    │
│ TIME LEFT       5:00 min.    │
│ MOTOR 805 M        [STOP]    │
└─────────────────────────────┘
      △        △        △
    (F1)     (F2)     (F3)
```

The current pressure in Pa and the volumetric flow in l/s (with two decimal places) are displayed continuously. In addition, a numerical value between 0 (speed = 0) and 4095 (maximum speed) appears in the display **(5)** for orientation purposes and indicates the speed of the compressor (fan). Whenever the test pressure is within the tolerance window, a countdown counter counts down from 5 minutes to 0. The measurement ends after the time has expired or by pressing the **STOP (F3) button**.

The evaluation uses the average of the measured values from the entire test duration. However, if the test duration during which the test pressure was within the tolerance range band is less than 5 min, as with the automatic measurement, no statement is made whether the test was passed or not, as it was not performed in conformity with the standard for a duration of 5 minutes.
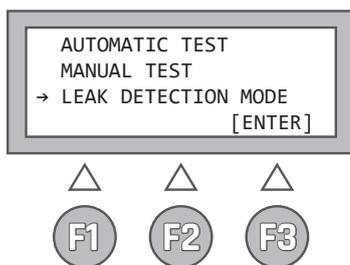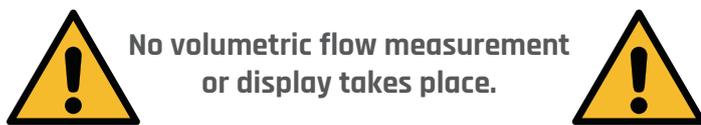
The same options for recording the test exist for manual test mode as for automatic mode. (See also page 46)

LEAK DETECTION MODE

Leak detection mode

This mode is used to apply a constant positive pressure to the duct system for a specific period of time, to search for possible leaks during this time.

The air hose must be connected to the positive pressure connection.

No volumetric flow measurement or display takes place.

```
  AUTOMATIC TEST
  MANUAL TEST
→ LEAK DETECTION MODE
             [ENTER]
```

F1   F2   F3

After selecting this mode, the saved parameters from the previous use of Leak Detection mode are shown on the display, namely

· in line 1   the test pressure
· in line 2   the duration
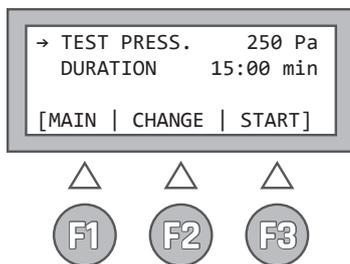
```
→ TEST PRESS.    250 Pa
  DURATION     15:00 min

[MAIN | CHANGE | START]
```

F1   F2   F3

The buttons have the following labelling and meaning:
F1 - MAIN   Back to Main menu
F2 - CHANGE   Switch to the submenus to change the test time and duration parameters. An arrow in the respective line indicates the menu to which the program switches. The arrow can be moved vertically using the arrow buttons ↑ and ↓.
F3 - START   Start Leak Detection mode.

In the TEST PRESS. submenu
the arrow buttons ↑ and ↓ can be used to set the test pressure within the limits 50 to 500 Pa in 5 Pa increments (the default pressure the first time this mode is called up is 250 Pa). If the arrow buttons are pressed for longer than 1.5 s, the pressure value changes quickly.

F2 - CHANGE   Change the "Pressure" parameter

```
TEST PRESS.     250 Pa

             [ENTER]
```

F1   F2   F3
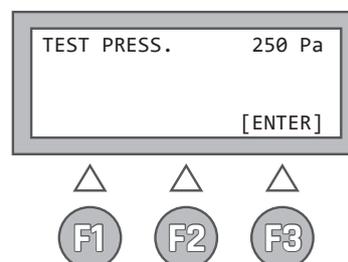
In the DURATION submenu
the arrow buttons ↑ and ↓ can be used to set a test duration of 1 to 30 min in 10 sec. intervals (the default time when this mode is first called up is 15 min). If the arrow buttons are pressed for longer than 1.5 s, the time value changes quickly.

F2 - CHANGE   Change the "Time" parameter

```
DURATION      15:00 min

[ENTER]
```

F1   F2   F3
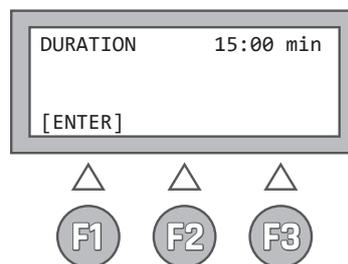
Leak detection mode starts after the **START button (F3)** is pressed. The current pressure in Pa and the remaining time are displayed continuously. The device switches off the fan (compressor) after the time has expired. The **STOP (F3) button** can also be used to end this mode beforehand.

```
TEST PRESS.     158 Pa
TIME LEFT    14:55 min

             [STOP]
```
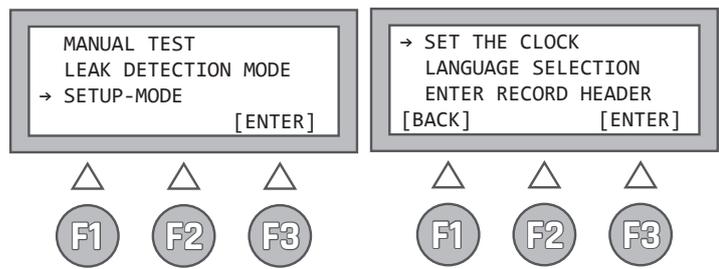
F1   F2   F3
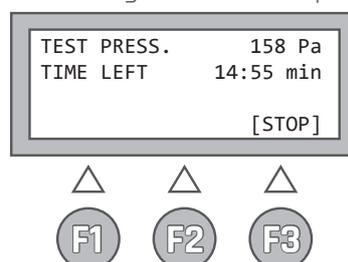
SETUP MODE

Setup mode

This menu contains the following submenus:

- Setting the clock (watch)
- Enter record header
- Language selection
- Class Z
- Test duration

The selection is made using the arrow buttons, as in the Main menu.

```
   MANUAL TEST
   LEAK DETECTION MODE
→  SETUP-MODE
                    [ENTER]
```

F1 F2 F3

```
→  SET THE CLOCK
   LANGUAGE SELECTION
   ENTER RECORD HEADER
[BACK]            [ENTER]
```
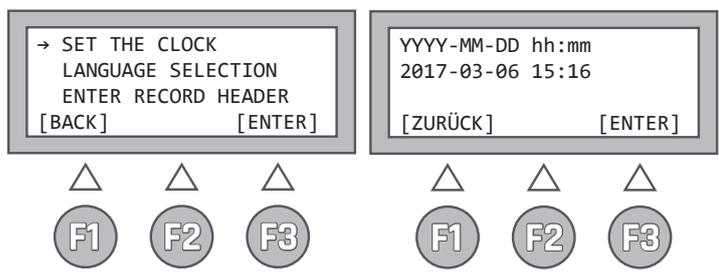
F1 F2 F3

Setting the clock (watch)

The integrated realtime clock can be set here.

The day, month (two-digit) and year (four-digit) and the hour and minutes (two-digit) are each edited. The arrow buttons ↑ and ↓ are used to increase and decrease the parameters. By pressing the ENTER button the clock is started at the entered minute accurate to the nearest second and the program branches back to the Main menu.

Depending on the selected language, the date and time have the following format:

```
→  SET THE CLOCK
   LANGUAGE SELECTION
   ENTER RECORD HEADER
[BACK]            [ENTER]
```

F1 F2 F3

```
YYYY-MM-DD hh:mm
2017-03-06 15:16

[ZURÜCK]          [ENTER]
```

F1 F2 F3

Language selection

This menu is used to select the language on the display **(5)** and on the paper printout from the record printer **(12)**.

```
   SET THE CLOCK
→  LANGUAGE SELECTION
   ENTER RECORD HEADER
[BACK]            [ENTER]
```

F1 F2 F3
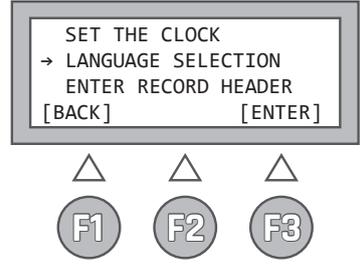
You can choose between

- German
- English
- French
- Italian
- Swedish

The date and time format also change automatically with the selection of the language.

```
→  DEUTSCH
   ENGLISH
   FRANCAIS
                    [ENTER]
```

F1 F2 F3

```
   FRANCAIS
   ITALIANO
→  SVENSKA
                    [ENTER]
```

F1 F2 F3
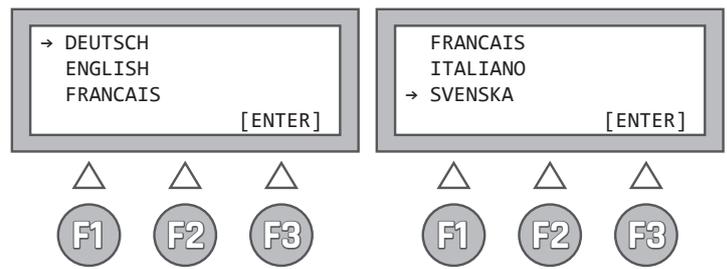
Enter record header

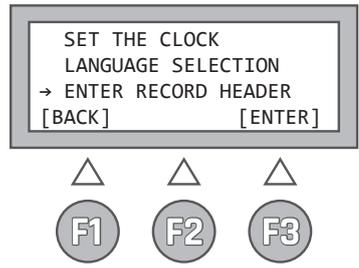The header of the printed record is made up of seven lines, each with 32 characters and can be used to show the company name and address. These lines are still empty when the device is delivered to the customer by the manufacturer.

```
   SET THE CLOCK
   LANGUAGE SELECTION
 → ENTER RECORD HEADER
 [BACK]          [ENTER]
```

△ △ △
(F1) (F2) (F3)

K

The customer can configure the record header easily as follows:

A text only file with the name "KOPF.TXT" (HEADER.TXT) is created at the PC using the WINDOWS text editor. It must be ensured that this file contains only 7 lines, each with 32 characters. Any additional characters and lines are ignored. This file is copied onto a USB stick. The USB stick does not have to be empty, i.e. it can contain other data. However, it must not have a storage volume larger than 4 GB, to prevent complications with the software. The "KOPF.TXT" file should be in the root directory.

The "Enter Record Header" menu item is opened at the airLPT216. The user is then prompted to plug the USB stick into the USB port **(6)** at the top of the device.

```
 PLEASE PLUG IN USB
 STICK WITH „KOPF.TXT"

 [BACK]          [ENTER]
```

△ △ △
(F1) (F2) (F3)
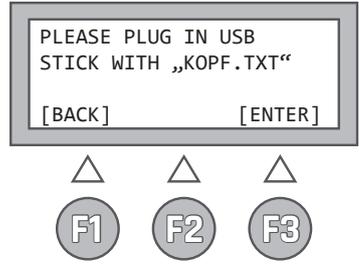
The file is transferred and the record header is permanently saved in the device. If the process is completed successfully, which only takes a few seconds, the user is informed.

```
 RECORD HEADER RECEIVED
 WITHOUT ERRORS

```

△ △ △
(F1) (F2) (F3)
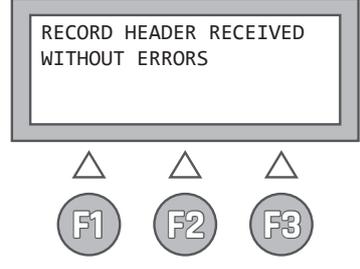
Otherwise an error message appears (e.g. if the KOPF.TXT files was not found on the USB stick).

```
 FILE NOT FOUND

```

△ △ △
(F1) (F2) (F3)
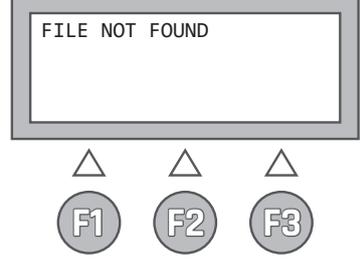
Class Z

Special test requirements require a leakage factor that differs from the standardised air tightness classes. Use the arrow buttons ↑ and ↓ to set a value between 0.0001 and 0.035 l/s. If the arrow buttons are pressed for longer than 1.5 s, the value changes quickly.
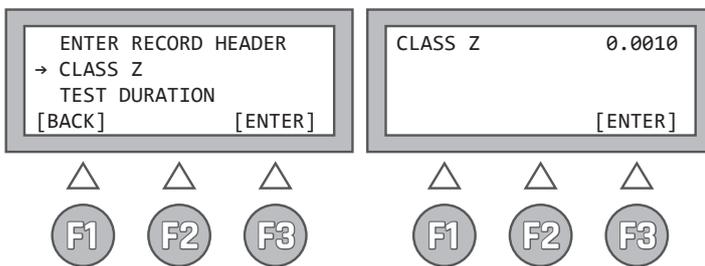
```
  ENTER RECORD HEADER
→ CLASS Z
  TEST DURATION
[BACK]          [ENTER]
```
△ △ △
(F1) (F2) (F3)

```
CLASS Z          0.0010



                [ENTER]
```
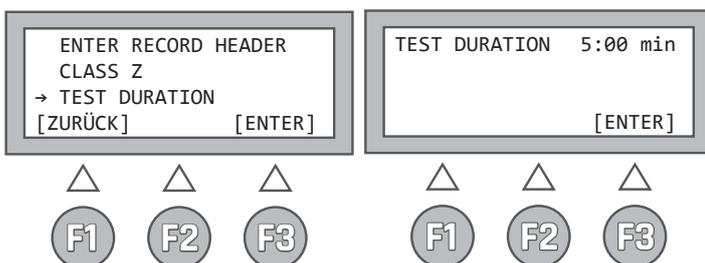△ △ △
(F1) (F2) (F3)

Stored leakage factors to EN 1507 and EN 12237:

- Class A – 0.027 l/s
- Class B – 0.009 l/s
- Class C – 0.003 l/s
- Class D – 0.001 l/s

Class Z – variable between 0.0001 and 0.035 l/s (see also Appendix, page 62)

Test duration

For some test requirements it is also necessary to use a different test duration. The arrow buttons ↑ and ↓ can be used to set the test duration between 30 and 300 s. If the arrow buttons are pressed for longer than 1.5 s, the value changes quickly. The test period is preset to 5 min (300 sec.) in the as-delivered test device.

```
  ENTER RECORD HEADER
  CLASS Z
→ TEST DURATION
[ZURÜCK]        [ENTER]
```
△ △ △
(F1) (F2) (F3)

```
TEST DURATION   5:00 min



                [ENTER]
```
△ △ △
(F1) (F2) (F3)

Record printer

A record printer **(12)** is permanently installed on the airLPT216.

To change the paper roll, open it by carefully pulling the roll cover **(13)** on the top of the printer.
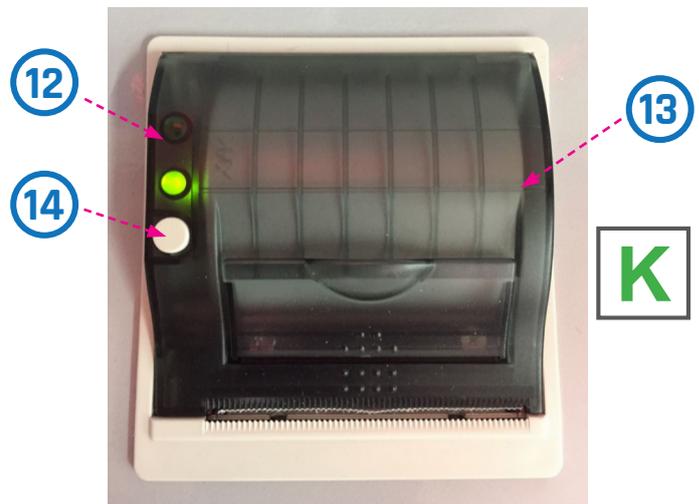
The button **(14)** on the left-hand side of the printer can be used to feed the paper manually.

The functions of the airLPT216 air leak proof tester can also be controlled using an app. This is configured for the Android operating system. A smartphone / tablet with at least 1 GHz processor and at least 10 MB free internal memory is required to use the app. The mobile terminal must have a Bluetooth module and support this type of connection. The Android app is to be used with Android version 4.5 and higher.

To open the test records in PDF format a corresponding app must be installed, e.g. Adobe Acrobat.

The airLPT216 Android APP is provided by the manufacturer for an additional price.

Startup

The startup is performed to establish communication with the tester. A Bluetooth connection is set up and all device data is read out of the device. The tester must be switched on and Bluetooth activated on the mobile terminal.
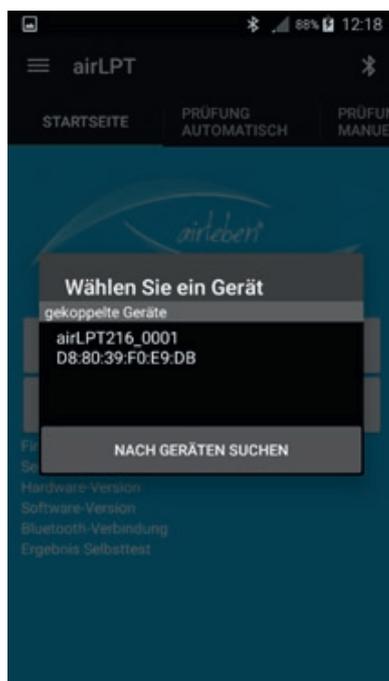
The device details such as company name, name of the device, hardware version, software version and the status of the self-test are read out and displayed.

The time is read out from the airLPT216 and is compared with the time of the mobile terminal. A warning is output if there is a difference of more than 1 minute. The user can transfer the time from the app to the device.

Furthermore, the record header data is copied from the device. You can change these in the Setup mode of the app.

⚠️ **If a Bluetooth connection exists, the airLPT216 can no longer be operated using the device buttons.**

If the connection is interrupted, this is also displayed and after 30 seconds has expired the tester automatically switches to an operable mode.

If the connection is interrupted, all test operations are stopped automatically.

Main menu

The individual points of the Main menu can be reached using the buttons on the Start page, the navigation bar on the left edge of the screen or the tabs of the menu bar.

The navigation bar on the left edge of the screen opens if the logo in the menu bar is pressed.

You can choose between the following:
 · Automatic test mode
 · Manual test mode
 · Leak detection mode
 · Setup mode
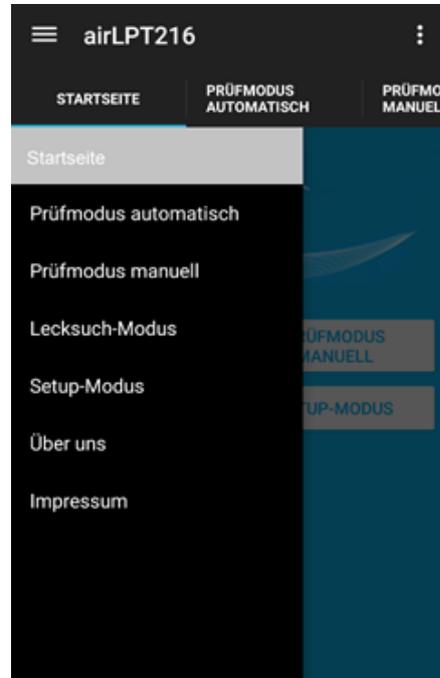
Automatic test mode

"Test automatically" is activated. The window for setting the test parameters appears. The user is prompted to choose the air tightness class, the test pressure and the surface area.

In the tightness Class field the user can choose between tightness classes A, B, C, D or Z.

In the Test Pressure field the test pressure can be set up to 6,500 Pa. After entering the value, the Positive pressure or Negative pressure button must be pressed to define the type of test pressure.

In the Surface field the surface area can be set between 0.1 and 2,000 m^2.

Alternatively, the dimensions of a rectangular air duct can be entered in the Height, Width and Length fields. The Calculate button is used to determine the surface area from the dimensions entered and the value is transferred into the Surface field.

Press the Start button to transmit the data to the tester and the test begins. The automatic test can be ended prematurely by pressing the Stop button.

Press the STOP (F3) button on the tester to interrupt the test process at any time.

After starting the test process the current pressure is in Pa, the volume flow in l/s (with two decimal places) and the test time are displayed continuously.

After the test time has expired the following data is displayed:

· average test pressure [Pa]
· average volume flow, i.e. leakage volume [l/s and m^3/h]
· maximum permitted volume flow (leakage volume) according to class and surface [l/s and m^3/h]
· Test passed (ok) or failed (not ok)
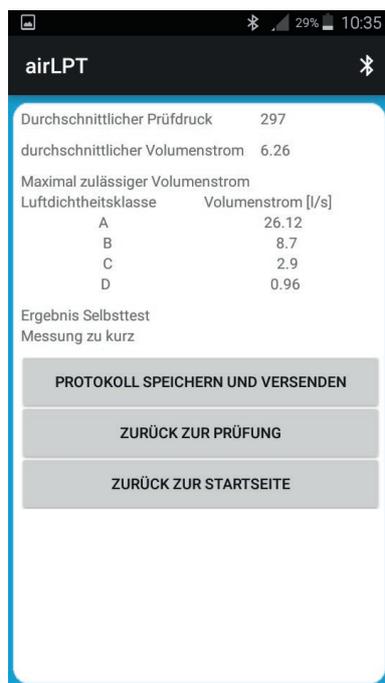
The "Test" button is used to switch back to input and the "Start page" button to switch to the Main menu.

If "Save record" is pressed the data is saved as a PDF file in the mobile terminal device. This record can then be sent by email or can also be deleted manually.

Manual test mode

This corresponds to automatic test mode, with the exception that the test pressure must be adjusted manually by changing the fan speed to the entered target value.

The program prompts for the same data as for automatic test mode.

When the Start button is pressed the data are transferred to the tester and the test begins with minimum compressor (fan) speed.

The manual test can be ended prematurely by pressing the Stop button.

Press the STOP (F3) button on the tester to interrupt the test process at any time.

After starting the test process the current pressure in Pa, the volume flow in l/s (with two decimal places), the test duration and the compressor (fan) speed are displayed continuously.

The compressor (fan) speed control buttons can be used to adjust the speed between 0 (speed = 0) and 4095 (maximum speed).
Whenever the test pressure is within the tolerance window the measured values are recorded and the test duration decreases.

After the test time has expired the following data is displayed:
- average test pressure [Pa]
- average volume flow, i.e. leakage volume [l/s and m^3/h]
- maximum permitted volume flow (leakage volume) according to class and surface [l/s and m^3/h]
- Test passed (ok) or failed (not ok)
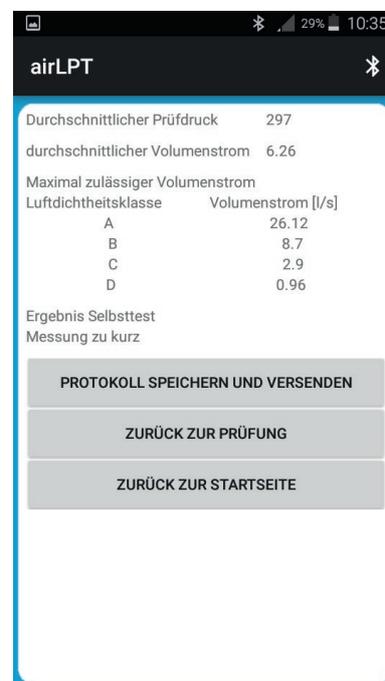
The "Test" button is pressed wot switch back to input and the "Start" page button is pressed to switch back to the Main menu.

If "Save record" is pressed the data is saved as a PDF file in the mobile terminal device. This record can then be sent by email or can also be deleted manually.

Leak detection mode

This mode is used to apply a constant positive pressure to the duct system for a specific period of time, to search for possible leaks during this time.

The air hose must be connected to the positive pressure connection

⚠️ **No volumetric flow measurement or display takes place.**

In the TEST PRESS. field the test pressure can be set within the limits 50 to 500 Pa (the default pressure on opening this mode is 250 Pa).

A test duration of 1 to 30 minutes can be set in the DURATION field (the default time on opening this mode is 15 minutes).

The leak detection mode begins after the Start button is pressed. The current pressure in Pa and the remaining time are displayed continuously. The device switches off the fan (compressor) after the time has expired.

This mode can also be ended prematurely by pressing the Stop button.

⚠️ **Press the STOP (F3) button on the tester to interrupt the test process at any time.**

Setup-Mode

The device data are read out and displayed in the app. The record header data are displayed and can be changed. After pressing the Save button the data is transmitted to the tester.

The mobile terminal uses the time and date obtained from the radio network. Both can be set manually and transmitted to the tester.

The manual setting of the app language, the language of the PDF record and the device language, incl. record printout, is made via the language selection. Furthermore, the date of the next inspection is displayed.

SERVICING AND GUARANTEE

Service interval

The airLPT216 air leakproof tester is tested in the manufacturer's factory and is subjected to quality control. This is documented with a calibration record. A corresponding record is enclosed with each device.

The device should be tested yearly by the manufacturer for full functionality and its measurement accuracy checked. To this end, you can send the air leakproof tester (with hoses) to the following address:

airleben GmbH
Goldbacher Straße 37
99867 Gotha, Germany
Tel.: +49 3621 51445-0
Fax: +49 3621 51445-219

The calibration in the manufacturer's factory takes approx. 1-2 weeks.

Guarantee

The guarantee period is one year (12 months) from date of sale and is subject to appropriate, proper and intended use of the device. Wearing parts (such as hoses, adapters), consumables (such as paper rolls) and the costs for packaging and transport are excluded from the guarantee. This guarantee expires if unauthorised third parties have carried out repairs on the device.

DECLARATION OF CONFORMITY

Declaration of Conformity

The company:

airleben GmbH
Goldbacher Straße 37
99867 Gotha, Germany
Tel.: +49 3621 51445-0
Fax: +49 3621 51445-219

declares that, based on independent measurements, the product: airLPT216 air leakproof tester complies with the fundamental protection requirements defined in the Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility. The following standards were used to assess the electromagnetic compatibility:

EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements
EN 55011:2017-03*	Industrial, scientific and medical equipment. Radio-frequency disturbance characteristics. Limits and methods of measurement
EN 61000-3-2:2015-03	Electromagnetic Compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3:2014-03	Electromagnetic Compatibility (EMC) - Part 3-3: Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

CE marking attached to device

*valid from 01.03.2017

Gotha, 07 March 2017   Bernd Neupert, Managing Director

TROUBLESHOOTING

Troubleshooting

Fault	Possible cause	Action
Device does not work	Power cable not connected	Connect power cable (open side flap on the right)
	Device not switched on	Switch on device
	Device fuse defective	Check device fuse, replace if necessary
Printer does not print	Paper roll empty	Insert new paper roll
	Roll cover not closed	Close roll cover
Check backup battery WATCH BATT. ALMOST FLAT!	Backup battery almost flat	Switch off device and hand it in to the service department
Check program memory PROGRAM MEMORY ERROR	Internal error	Switch off device and hand it in to the service department
Check parameter memory SETUP MEMORY ERROR	Internal error	Switch off device and hand it in to the service department
USB drive error	USB drive error or defective USB stick	Replace USB stick; device can continue to be used; however, without option of saving data on USB stick, hand in device to the service department
Button test BUTTON ERROR	Internal error	Gerät ausschalten und zum Service geben
Volume flow sensor test VOLUME FLOW SENSOR	Internal error	Switch off device and hand it in to the service department
Pressure sensor test PRESSURE SENSOR ERROR		Switch off device and hand it in to the service department
Fan motor test FAN MOTOR ERROR		Switch off device Remove the air hose and pressure measurement hose from the device. Switch on device and test again. If the error persists the device must be handed in to the service department.

Note:

Please contact the manufacturer in case of operating faults or errors, which you cannot correct yourself using these operating instructions.

ACCESSORIES

Accessories / wearing parts

Art. No.: 7303228	Accessories case made of plastic, without document wallet
Art. No.: 7303229	Document wallet for accessories case
Art. No.: 7301473	Power cable 230 V AC (3 m long)
Art. No.: 7303227	Air hose, black (5 m long) with couplings for connection to tester and to air duct system to be tested
Art. No.: 7303226	Pressure measuring hose, black (10 m long) with couplings for connection to tester and to air duct system to be tested
Art. No.: 7301369	Paper roll for record printer, strip width 58 mm
Art. No.: 7303230	USB stick 2 GB
Art. No.: 7300358	Adapter A32 for air hose for connection to RD32
Art. No.: 7300355	Adapter seal AD32 for adapter A32
Art. No.: 7300357	Adapter A21 for pressure measuring hose for connection to RD21
Art. No.: 7300356	Adapter seal AD21 for adapter A21

APPENDIX

Appendix

Measurement range limits of the airLPT216 air leakproof tester (theoretically testable surface area in m^2**)**

Test pressure (Pa)	Air tightness class A	Air tightness class B	Air tightness class C	Air tightness class D
50 Pa	95	285	855	2565
200 Pa	38	114	342	1026
400 Pa	25	75	225	675
500 Pa	22	66	198	594
750 Pa	17	51	153	459
1000 Pa	14	42	126	378
2000 Pa	8	24	72	216

Air tightness classes - comparison

DIN 24194	DIN EN 1507	DIN EN 12237	DIN EN 15727	DIN EN 13779
I				
II	A	A	A	A
III	**B**	**B**	**B**	**B**
IV	C	C	C	C
	D	D	D	D

Air tightness classes to EN 1507

| Air tightness class	Limit value of the air leakage rate $(m^3/s*m^2)$	Limit value of the static pressure gauge pressure (Pa) Pressure class		
		1	2	3
A	$0{,}027*p_{test}^{0,65}*10^{-3}$	-200/+400		
B	$0{,}009*p_{test}^{0,65}*10^{-3}$	-500/+400	-500/+1000	-500/+2000
C	$0{,}003*p_{test}^{0,65}*10^{-3}$	-750/+400	-750/+1000	-750/+2000
D	$0{,}001*p_{test}^{0,65}*10^{-3}$	-750/+400	-750/+1000	-750/+2000

LEAKAGE VALUES

Permitted leakage values

Air tightness class Test pressure [Pa] Surface [m²]	A							B						
	50	200	400	500	750	1000	2000	50	200	400	500	750	1000	2000
	Leakage [l/s]							Leakage [l/s]						
10	3,43	8,45	13,26	15,34	19,96	24,06	37,76	1,14	2,82	4,42	5,11	6,65	8,02	12,59
15	5,15	12,68	19,90	23,00	29,94	36,10	-	1,72	4,23	6,63	7,67	9,98	12,03	18,88
20	6,87	16,91	26,53	30,67	-	-	-	2,29	5,64	8,84	10,22	13,31	16,04	25,17
30	10,30	25,36	39,79	-	-	-	-	3,43	8,45	13,26	15,34	19,96	24,06	37,76
40	13,73	33,81	-	-	-	-	-	4,58	11,27	17,69	20,45	26,61	32,09	-
50	17,17	-	-	-	-	-	-	5,72	14,09	22,11	25,56	33,27	-	-
70	24,03	-	-	-	-	-	-	8,01	19,72	30,95	35,78	-	-	-
100	34,33	-	-	-	-	-	-	11,44	28,18	-	-	-	-	-
120	-	-	-	-	-	-	-	13,73	33,81	-	-	-	-	-
150	-	-	-	-	-	-	-	17,17	-	-	-	-	-	-

Air tightness class Test pressure [Pa] Surface [m²]	C							D						
	50	200	400	500	750	1000	2000	50	200	400	500	750	1000	2000
	Leakage [l/s]							Leakage [l/s]						
10	0,38	0,94	1,47	1,70	2,22	2,67	4,20	0,13	0,31	0,49	0,57	0,74	0,89	1,40
15	0,57	1,41	2,21	2,56	3,33	4,01	6,29	0,19	0,47	0,74	0,85	1,11	1,34	2,10
20	0,76	1,88	2,95	3,41	4,44	5,35	8,39	0,25	0,63	0,98	1,14	1,48	1,78	2,80
30	1,14	2,82	4,42	5,11	6,65	8,02	12,59	0,38	0,94	1,47	1,70	2,22	2,67	4,20
40	1,53	3,76	5,90	6,82	8,87	10,70	16,78	0,51	1,25	1,97	2,27	2,96	3,57	5,59
50	1,91	4,70	7,37	8,52	11,09	13,37	20,89	0,64	1,57	2,46	2,84	3,70	4,46	6,99
70	2,67	6,57	10,32	11,93	15,52	18,72	29,37	0,89	2,19	3,44	3,98	5,17	6,24	9,79
100	3,81	9,39	14,74	17,04	22,18	26,74	-	1,27	3,13	4,91	5,68	7,39	8,91	13,99
120	4,58	11,27	17,69	20,45	26,61	32,09	-	1,53	3,76	5,90	6,82	8,87	10,70	16,78
150	5,72	14,09	22,11	25,56	33,27	-	-	1,91	4,70	7,37	8,52	11,09	13,37	20,98

airleben®

...Sie Lüftungskompetenz
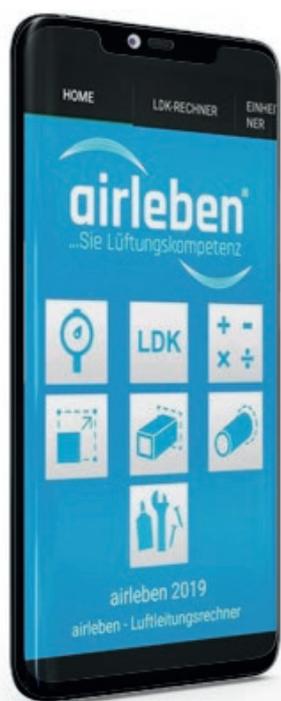
Use our airTool too!

Available for iOS and Android

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The test pressure and the air duct surface area are entered in the air tightness class calculator (LDK calculator). The air leakage rate is then calculated according to the selected air tightness class. You can also send all data by email.