

User manual

airLPT113

airLeakProofTester



User manual

airLeakProofTester 113

Version 1.13 Status 05.2014

An airtightness test on ventilating and air-conditioning systems is necessary to check that the required airtightness class has been complied with and that the ductwork is still therefore airtight. The requirements of ventilating and air-conditioning systems are based on DIN EN 13779 "Ventilation of non-residential buildings – general principles and requirements of ventilating and air-conditioning systems."

Leaking ventilation systems waste energy. Energy savings can be made by making air lines more airtight. Furthermore, leaking systems can pose hygiene risks. Insufficient quantities of air at the destination point caused by leakages can have an adverse effect on ambient conditions.

The airLPT113 serves to determine the volume of leaked air and the airtightness class attained according to DIN EN 13779, or DIN EN 1507 and DIN EN 12237, especially in air conditioning systems. Because the airtightness class is determined automati-

cally, the device has a wide range of applications ranging from the smallest systems (8 m² surface area) up to large systems.

The airLPT113, which is fully equipped and supplied in a robust aluminium case, has been specially designed for use on construction sites. The device is light and easy to carry as it weighs less than 12 kg. The hoses and accessories are conveniently packaged in a robust carrying bag.

The device is simple to operate thanks to its clear and user-friendly menu navigation. It is suitable for positive and negative pressure tests. All the connections, the display and the thermal printer are clearly laid out on the top of the device. The air hose connection for underpressure measurement is led out from the side of the device.

The automatic measuring process according to DIN EN 1507 and DIN EN 12237 takes 5 minutes. The air duct system to be tested is sealed off airtight from the rest of the system. Test pressure is applied, which is automatically regulated and maintained at a constant level (+/- 5 % according to the relevant

standard), and the air leakage rate is determined. The measurement report is printed on an integrated thermal printer or transmitted to a USB stick for data transfer.

If you would like to find out more about the technical aspects of the airLPT113, please visit our website www.airleben.de or call us on +49 (0) 3621 51445-0.

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General information

The information provided in this operating manual will enable you to operate the airLPT113 safely. Read this operating manual carefully and retain it for further reference.

The airtightness testing device airLPT113 must be used solely by competent personnel and used solely for its intended purpose. The device was designed for testing the airtightness of air duct systems, especially in air conditioning systems and is intended to be used as a measuring device. An extended search for leaks must be made only in the leak search mode. The device should be transported, stored and used under dust-free and dry conditions. Avoid the connections for the air hose and the pressure measuring hose becoming contaminated (e.g. with dust or moisture).

The device should never be opened by the user.



Caution: Danger to life: 230 V, 50 Hz!



The device must be opened only by a qualified and skilled person. If the device fails to function, follow the instructions in the section on troubleshooting or contact the manufacturer.

Any modification to the original condition of the device is not permitted.

Sole responsibility rests with the user and not the manufacturer for

any personal injury or material damage caused by using the device other than for its intended purpose, or by a failure to follow the instructions in this operating manual.

Manufacturer

airleben GmbH
Goldbacher Straße 37
99867 Gotha
Tel.: 03621/51445-0
Fax: 03621/51445-219
www.airleben.de

Electronic devices must not be disposed of with household waste. They must be disposed of in accordance with the applicable environmental regulations. Defective batteries are classed as hazardous waste and must be disposed of at the designated collection points.

Explanation of the symbols used



Danger from electricity. This symbol warns of the dangers posed by electric currents and dangerous voltages.



Caution/important. This symbol provides important information on how to handle the equipment correctly.



Quick guide - a quick start guide to using the airtightness testing device.

Technical data

- 4 line illuminated display
- Voltage supply 230 V, 50 Hz
- Power input: max. 1500 W
- Weight: approx. 12 kg
- Dimensions (LWH): 560 mm x 310 mm x 270 mm
- Operating range: +5 to +50°C
- Storage temperature: -20 to +50°C
- Operating capacity: 0.11 - 25 l/s; 0.40 - 90 m³/h
- Airtightness classes according to DIN EN 1507: LDK A / LDK B / LDK C / LDK D
- max. test pressure: +/- 2700 Pa
- Pressure measurement
 - with piezo-resistive semiconductor sensor in the measuring range -3000 to +3000 Pa
 - Resolution 2 Pa
 - Combined error 1.8 % FS
- Flow rate measurement
 - with hot film anemometer (standardised to 1013.25 hPa and 20°C)
 - measuring range 0.11 to 36.5 l/s
 - Resolution 0.01 l/s
 - Combined error +/- 5 % of MV

Equipment/scope of delivery

- 1 airLPT113 supplied in an aluminium case
- 1 carrying bag with carrying strap
 - 1 power cable 230 V AC (length 2m)
 - 1 air hose (length 5 m) with couplings for connection to the basic device and the air duct system to be tested
 - 1 air hose (length 5 m) for pressure measurement with couplings for connection to the basic device and the air duct system to be tested
 - 1 portable log printer with an integrated Li-ion battery, band size 57 mm
 - 1 charger for the log printer
 - 1 spare paper roll for log printer
 - 1 copy of the operating manual/calibration protocol
 - 2 keys for the aluminium case
 - USB flash drive

Operating controls

1. Slide flap
2. Power supply (power socket)
3. Fuse
4. Power switch
5. Display
6. USB flash drive
7. Air hose
8. Overpressure air connection
9. Underpressure air connection
10. Pressure measuring hose with detachable adapter
11. Pressure measuring connection
12. Log printer
13. Serial interface (hardware preparation for 2nd expansion stage. No function has yet been assigned to this interface).



Start-up

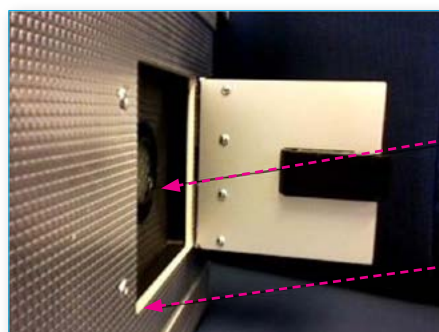
The airLPT113 is connected by the associated power lead (power cable) to the electric supply network (230 V, 50 Hz) and is switched on at the power switch (4).



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



After the device has been switched on, the display (5) shows the firm, name of the device, the hard and software version and the number of tests carried out since the last inspection.



2

Power
connection

3

Fuse

After the device has been switched on, the display (5) shows the firm, name of the device, the hard and software version and the number of tests carried out since the last inspection.



Arrow keys
↑
and
↓

After three seconds the device indicates on the display (5) that internal tests (device self test) are being carried out.

These tests comprise:

1. Display test (visual only)
2. Test of the back-up battery for the real-time clock with warning if battery needs changing
3. Programme memory test
4. Parameter memory test
5. Keyboard test (to check if the keys are sticking)
6. USB flash drive test
7. Test to check the flow sensor is adhering to the limit values of the signals.
8. Test to check the differential pressure sensor is adhering to the limit values of the signals.
9. Starting up the fan for a short period



The display (5) then provides information on whether all the internal tests have been passed or it displays an appropriate error message. If serious errors have occurred (errors 3, 4, 5, 7, 8, 9), the device cannot be used or can be used only to a limited extent. It must be repaired or sent in to the manufacturer for repair (see also the section of troubleshooting on page 26).

A test of the USB drive (6) is also carried out (after the keyboard test), irrespective of whether a USB stick has been inserted.



If an error occurs in this test, a warning is displayed for 3 seconds on the display (5). This error is NOT a serious error. You can continue to use the device although you will not be able to read and save data on the USB stick.

The storage capacity of the USB stick must not exceed 4 GB to prevent complications arising with the software. We recommend you use the USB stick supplied with the device.

Overpressure measurement

To carry out an overpressure measurement connect the air hose (7) to the overpressure air connection on the top side of the device (8).



K

7

Connect the pressure measuring hose (10) to the pressure measuring connection (11) which is also on the top side of the device. Connect both hoses to the air duct system to be tested.



10

The air duct system to be tested must be sealed airtight from the rest of the system. The use of foil and adhesive tape to seal the openings should be avoided as these usually lead to major measuring errors. The openings should be sealed in a technically correct manner, e.g. by end caps. The airLPT113 is connected via prepared measuring openings. These can be, for example, flanged collars or inspection openings with suitable adapters. According to DIN EN 12599 the test pressure as overpressure for supply air ducts or as underpressure for air discharge ducts, should be 200 Pa, 400 Pa or 1000 Pa and should be at the midpoint of the average operating pressure range.

Underpressure measurement

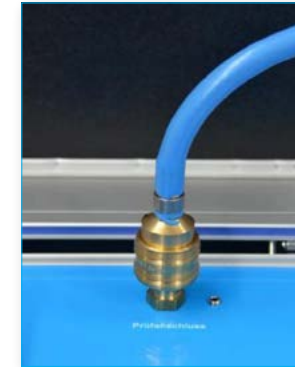
To carry out an underpressure measurement connect the air hose (7) to the underpressure air connection (9) on the right hand side of the device.



K

7

Connect the pressure measuring hose (10) to the pressure measuring connection (11) on the upper side of the device. Connect both hoses to the air duct system to be tested.



10

The air duct system to be tested must be sealed airtight from the rest of the system. The use of foil and adhesive tape to seal the openings should be avoided as these usually lead to major measuring errors. The openings should be sealed in a technically correct manner, e.g. by end caps. The airLPT113 is connected via prepared measuring openings. These can be, for example, flanged collars or inspection openings with suitable adapters. According to DIN EN 12599 the test pressure as overpressure for supply air ducts or as underpressure for air discharge ducts, should be 200 Pa, 400 Pa or 1000 Pa and should be at the midpoint of the average operating pressure range.

Main menu

The main menu is displayed after the device self tests have been passed. The display shows the operating modes that can be selected:

- Test Automatically
- Test Manually
- Leak detection mode
- Set-up mode

The menu used when the device was last operated is indicated by an arrow. To use this menu again, simply press the ENTER key. Otherwise you can select another menu by using the arrow keys \uparrow and \downarrow



Test automatically



The saved input parameters of the previous test are shown on the display, namely

- in line 1 - leakproof class A, B, C or D
- in line 2 - the test pressure, signed
- in line 3 - the air duct surface



In this menu the keys have the following labels and meaning.

- F1 - MAIN Return to the main menu
- F2 - CHANGE Jump to submenus to change the parameters "Tightness class", "Test pressure" and "surface" An arrow in the respective line shows which menu you have jumped to. The arrow can be moved vertically by the arrow keys \uparrow and \downarrow
- F3 - START Start the test

As the input parameters from the previous test have been saved, you can repeat a test simply by pressing the START key (F3).

In the Leakproof class submenu you can choose between the airtightness classes A, B, C or D.

- F2 - CHANGE Change the "leakproof class" parameter"



In the Test pressure submenu

you can set the test pressure between the limits - 3000 to +3000 Pa in 10 Pa steps by using the arrow keys \uparrow and \downarrow . If you hold down the arrow keys for more than 1.5 seconds, the pressure value is changed quickly.

- F2 - CHANGE Change the "test pressure" parameter



In the SURFACE submenu you can set the surface between the limits of 3 to 300 m² in 0.1 m² steps by using the arrow keys \blacktriangle and \blacktriangledown . If you hold down the arrow keys for more than 1.5 seconds, the surface value is changed quickly.

F2 - CHANGE Change the "surface" parameter



Testing starts after the START (F3) key has been pressed. The current pressure in Pa and the flow rate in l/s (to two decimal places) are displayed constantly. The automatic control system adjusts the pressure to the preset test pressure. As soon as the pressure is accurate to within +/- 5%, the actual measuring time of 5 min starts. A counter tells you how much measuring time is left. This counter is stopped if the test pressure goes outside the abovenamed tolerance zone once during the test.



You can terminate the automatic testing prematurely by pressing the STOP key (F3). An evaluation is then made on the basis of the measuring time elapsed up to this point. However, a statement is not made as to whether the test was passed as the test was not carried out over a period of 5 min as required by the standard (see EN 1507:2006 paragraph 5.22).

If the leak volume at the test pressure set exceeds 36.0 l/s, the measurement is aborted with the following error message:

VOL. FLOW TOO BIG! PLEASE DECREASE VOLUME FLOW!



If the leak volume lies below the lower measurement limit of 0.11 l/s at the test pressure set, the measurement is aborted with the following error message:

VOL. FLOW TOO SMALL! PLEASE INCREASE VOLUME FLOW!



After the expiry of the test period the display (5) shows the following data:

Test pressure [Pa]

Average flow rate, i.e. leak volume [l/s]

Maximum permitted flow rate (leak volume) according to class and surface [l/s]

Test passed or test not passed

If the test was not passed, the entire line ("NOT passed") flashes on and off, i.e. the display changes periodically.



After the test has ended, the keys have the following function:

- F1 - MAIN Return to the main menu
- F2 - BACK Return to "automatic test mode" to repeat the test
- F3 - PRINT Print-out by log printer (12)

The measured values and test result are printed when the key is pressed again.



You can print the log from this menu as many times as required. If the printer is not switched on, the error message "Printer not ready. Please switch it on" appears on the display (5) when the print function is started. After the printer has been switched on, the "PRINT" (F3) key can be pressed again.



If the USB stick supplied is in the associated drive (6) at the start of the printing process, the log printout is written in parallel as a text file on the USB stick. The file name comprises the letters LPT and the 5 digit test number, e.g. "LPT00123.TXT". The date and time the file was created are saved and can be seen when the files are listed, e.g. in WINDOWS Explorer. This file will be written once only on the USB stick, irrespective of how often the hard copy log is printed.

Contents of the log printout

The log is printed in German or in English, according to the language selected (the example shown here is in English).

Log header

The log header contains seven lines which are freely configurable by the user, each comprising 32 characters for setting out company data. To configure these lines see the section on inputting the log header.

AIR LEAK PROOF TEST

“airleben airLPT113” “HW-Version 1.0”; “SW-Version 1.0”

Consecutive test numbering since last inspection

Date

Time

“Airtightness test on air duct according to the EN 12237, EN 1507 and EN 12599 standards”

“Data of text pieces”

- Mode of operation, manual or automatic
- Airtightness class selected, test pressure applied [Pa]
- Surface [m²] input
- Average pressure actually attained [Pa]
- Measuring time during which the test pressure was in the tolerance window [sec]
- Average volume of leaked air [l/s]
- Maximum permitted volume of leaked air at the specified test pressure and surface in class A, B, C and D [l/s]

if measuring time \geq 5 min:

“Test object ok or not ok”

this line is printed in twice the font size

if measuring time < 5min:

“Valuation not possible as test duration was less than 5 min.”

The maximum volumes of leaked air for the four airtightness classes are displayed.

Signature of the inspector

Signature of the client

Printout

```
airleben GmbH
Goldbacher Straße 37
99867 Gotha
Tel: +49 3621/51445-0
Fax: +49 3621/51445-219
www.airleben.de
airLAB - Test

LEAK PROOF TEST

airleben airLPT113
HW-Version 1.0
SW-Version 1.1

Test-No: 81
23/07/2014
7:33 am

Leak proof test at airducts
in accordance with the standards
EN 12237, EN 1507 und EN 12599

Data of test pieces

Test automatically
Leakproof class: C
Investigated surface: 60,6 m²
Target test pressure: -1000 Pa
Average test pressure: -1001 Pa
Measuring time: 300 sec
Average leakage vol.: 6,02 l/s
Permitted leakage vol: 16,21 l/s

Test object

OK

Class A: 145,92 l/s
Class B: 48,64 l/s
Class C: 16,21 l/s
Class D: 5,40 l/s

Signature Inspector
Signature client
```


Manual test mode

This corresponds to the automatic test mode with the following exceptions:

1. The test pressure must be manually adjusted to the set point value that has been input. This is done by changing the fan speed.
2. Measurements beyond the time limit of 5 min can also be made.



After the start key (F3) has been pressed, the fan does not start up automatically but must be adjusted by the arrow keys \uparrow and \downarrow to a speed of rotation at which the preset test pressure is maintained between the limits $\pm 5\%$. If you hold down the arrow keys for more than 1.5 seconds, the fan speed is changed quickly.



The current pressure in Pa and the flow rate in l/s (to two decimal places) are displayed constantly. In addition, a numerical value between 0 (speed of rotation = 0 and 2180 (maximum speed of rotation) appears in the display (5) to indicate the speed of rotation of the fan. A countdown counter counts down from 5 minutes to 0 whenever the test pressure is in the tolerance window. Thereafter, however, you may continue the test for as long as required. To terminate the measurement press the STOP (F3) key.

The average of the measured values from the entire measuring time is used for assessment purposes. However, if the measuring time in which the test pressure was in the tolerance band was under 5 min, no statement is made as to whether the test was passed as this test was not carried out over a period of 5 min as required by the standard. The same also applies to automatic measurement.

The test can be logged in the same way in the manual test mode as in the automatic mode (see also page 15).

Leak detection mode

This mode serves to load the air duct system with a constant pressure over a specific period of time in order to seek leaks in this period.



No volume flow measurement and display are carried out.



After this mode has been selected, the saved parameters from the previous use of the leak search mode are displayed on the display, namely

in line 1 - the test pressure

in line 2 - the duration of the test



The keys have the following labels and meaning:

- | | |
|-------------|--|
| F1 - MAIN | Return to the main menu |
| F2 - CHANGE | Jump to the submenus to change the test pressure and duration parameters. An arrow in the respective line shows which menu you have jumped to. The arrow can be moved vertically by the arrow keys \uparrow and \downarrow . |
| F3 - START | Start the leak detection mode. |

LEAK DETECTION MODE

In the TEST PRESSURE submenu

you can set the test pressure between the limits 10 to 500 Pa in 10 Pa steps by using the arrow keys \uparrow and \downarrow (the pressure setting is 200 Pa when you call up this mode for the first time). If you hold down the arrow keys for more than 1.5 seconds, the pressure value is changed quickly.

F2 - CHANGE Change the "pressure" parameter"

In the submenu DURATION you can set a test time

from between 1 to 30 min in 1 min steps by using the arrow keys \uparrow and \downarrow (the time setting is 15 min when you call up this mode for the first time). If you hold down the arrow keys for more than 1.5 seconds, the time value is changed quickly.

F2 - CHANGE Change the "time" parameter



The Leak Search Mode Testing starts after the START key (F3) has been pressed. The current pressure in Pa and the remaining time is displayed continuously. The device switches off the fan when the time has expired. You can also terminate this mode prematurely by pressing the STOP key (F3).



Setup-Mode

This menu contains the following submenus:

Setting the watch
Input Protocol Head
Choose the language

Selections are made as for the main menu by using the arrow keys.



Setting the watch

The integrated real-time clock can be set in this menu.

Day, month and year (two digit) as well as hour and minute (two digit) are each set. The arrow keys \uparrow and \downarrow serve to increment and decrement the parameters. By pressing the OK key the clock is started exact to the second for the minute input and is returned to the main menu.

Date and time have the following format according to the language selected:

German: xx.xx.xxxx (day, month, year)
xx:xx (hours, minutes 24 hour display)



Englisch: xxx (day, month, year)
xx:xx (hours, minutes 12 hour display) with AM or PM indicator



Input protocol head

The print log header comprises seven lines each of 32 characters and can be used to set out the firm's name and address. If the manufacturer has supplied the device to the customer, these lines will still be blank.



The customer can configure the log header easily as follows:

An only text file with the name "KOPF.TXT" is created by the WINDOWS text editor on the PC. Please note that this file contains only 7 lines each with 32 characters. Characters and lines in excess of these limits are ignored.

This file is copied on to a USB flash drive. The USB flash drive need not be empty, i.e. it can contain other files. The storage capacity of the USB flash drive must not however exceed 4 GB to prevent complications with the software. The file "KOPF.TXT" should be in the root directory.

Call up the menu item "Input protocol head". You will then be asked to insert the USB flash drive into the USB connection (6) on the upper side of the device.



The file is transferred and the log header permanently saved in the device. You will be informed if the process has been successfully completed. The process only takes a few seconds.



If the process has not been successfully completed, an error message appears (e.g. if the file KOPF.TXT was not found on the USB flash drive).



Choose the language

This menu enables you to select the language on the display (5) and the language in which the hard copy is printed by the log printer (12). You can choose between German and English. After you have selected the language, the format of the date and time display is changed automatically.



Log printer



A log printer (12) is permanently installed in the airLPT113. Note that the data cable (16) is connected to the left hand side of the printer. After you have switched on the device (19), a control tone is sounded and the LED display (14) provides information about the battery charge level. If the battery is not sufficiently charged, you can charge it by connecting it to the charger supplied on the left hand side of the printer (15). To change the paper roll open the roll cover (17) by pressing the key (18) on the upper side of the printer.



You can feed the paper manually by using the arrow key (20).

Maintenance interval

The airLPT113 is tested at the manufacturing plant and undergoes a quality inspection. This is documented with a calibration log. The relevant log is enclosed with every device.

The device should be checked once a year by the manufacturer to ensure it is working correctly and measuring accurately. The airLPT113 (with hoses) should be sent to the following address for the above checks to be made.

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

Calibration at the manufacturing plant takes about 1 to 2 weeks.

Warranty

The warranty period runs for one year (12 months) from the date of purchase and is conditional on the device being used properly, competently and for its intended use. Wear parts (such as hoses, adapters), consumables (such as paper rolls) and packaging and transport costs are excluded from the warranty. This warranty shall lapse if repairs are carried out on the device by an unauthorised third party.

Declaration of conformity

The company:

airleben GmbH
Goldbacher Straße 37
99867 Gotha
Tel.: 03621/51445-0
Fax: 03621/51445-219

declares that the airLPT113 complies on the basis of independent measurements with the essential safety requirements prescribed in the Council Directive 2004/108/EC on the harmonisation of the laws of the Member states of the EU relating to electromagnetic compatibility. The following standards were applied to evaluate electromagnetic compatibility.

DIN EN 61326-1:2013
EN 55011:2009
EN 61000-3-2:2006
EN 61000-3-3:2008

CE mark affixed to device

Gotha, 17.04.2014

Bernd Neupert, managing director

Troubleshooting

Cause	Possible cause	Measure
The device is not working	The power cable is not connected.	Connect the power cable. (Open the side flap on the right.)
	The device is not switched on.	Switch the device on.
	Defective fuse	Check, and if necessary, replace the fuse.
The printer is not printing.	The printer is not switched on.	Switch the printer on.
	The data cable is not connected.	Connect the data cable
	The batteries are discharged.	Replace or charge the batteries (a charger is supplied with the device). Connection is on the left hand side of the printer).
	The paper roll is empty.	Insert a new paper roll
Check the back-up battery CLOCK-BATT IS ALMOST FLAT!	The back-up battery is almost flat.	Switch off the device and return to the manufacturer for repair.
Check the program memory. ERROR PROGRAM MEMORY	Internal error	Switch off the device and return to the manufacturer for repair.
Check the parameter memory. ERROR SET-UP MEMORY	Internal error	Switch off the device and return to the manufacturer for repair.
Error USB drive	USB drive error or defective USB drive	Replace the USB stick. The device can continue to be used but it will not be possible to save data on the USB stick. Return the device to the manufacturer for repair
Keyboard test ERROR KEYBOARD	Internal error	Switch off the device and return to the manufacturer for repair.
Test flow sensor ERROR FLOW SENSOR	Internal error	Switch off the device and return to the manufacturer for repair.
Test pressure sensor ERROR PRESSURE SENSOR	Internal error	Switch off the device and return to the manufacturer for repair.
Test fan motor ERROR FAN MOTOR		Switch off the device. Remove the air hose and pressure measuring hose from the device. Switch the device on and re-check. If the error persists, the device must returned to the manufacturer for repair.

If malfunctions or errors occur which you cannot rectify yourself by using these operating instructions, please contact the manufacturer.

Accessories/wear parts

Art.- No.: 7301470 Carrying bag with carrying strap

Art.- No.: 7301473 Power cable 230 V AC (length 2 m)

Art.- No.: 7301474 Air hose (length 5 m) with couplings for connection to the basic device and the air duct system to be tested

Art.- No.: 7301477 Pressure measuring hose (length 5 m) with couplings for connection to the basic device and the air duct system to be tested

Art.- No.: 7301479 Log printer with an integrated Li-ion battery and serial port, band size 57 mm

Art.- No.: 7301481 Charger for printer battery

Art.- No.: 7301369 Paper roll for log printer band size 57 mm

Art.- No.: 7301378 USB stick

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 air hose for connection to RD21

Art.- No.: 7300356 Adapter seal AD21 for adapter A21

Appendix

Measuring range limits of the airLPT113 (theoretically testable surface)

Test pressure [Pa]	LDK A	LDK B	LDK C	LDK D
50 Pa	70 m ²	210 m ²	630 m ²	1890 m ²
200 Pa	30 m ²	90 m ²	270 m ²	810 m ²
400 Pa	19 m ²	57 m ²	171 m ²	513 m ²
500 Pa	17 m ²	51 m ²	153 m ²	459 m ²
750 Pa	13 m ²	39 m ²	117 m ²	351 m ²
1000 Pa	11 m ²	33 m ²	99 m ²	297 m ²
2000 Pa	7 m ²	21 m ²	63 m ²	189 m ²

Airtightness classes - comparison

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

Airtightness classes according to DIN EN 1507

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

Permissible leakage values

LDK Prüfdruck [Pa] Oberfläche [m ²]	A								B								C								D							
	50	200	400	500	750	1000	2000		50	200	400	500	750	1000	2000		50	200	400	500	750	1000	2000		50	200	400	500	750	1000	2000	
	Leakage [l/s]								Leakage [l/s]								Leakage [l/s]								Leakage [l/s]							
10	3,43	8,45	13,26	15,34	19,96	24,06	-	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		0,13	0,31	0,49	0,57	0,74	0,89	1,40		
15	5,15	12,68	19,90	23,00	-	-	-	1,72	4,23	6,63	7,67	9,98	12,03	18,88		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	6,87	16,91	-	-	-	-	-	2,29	5,64	8,84	10,22	13,31	16,04	25,17		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	10,30	25,36	-	-	-	-	-	3,43	8,45	13,26	15,34	19,96	24,06	-	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	13,73	-	-	-	-	-	-	4,58	11,27	17,69	20,45	-	-	-	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	17,17	-	-	-	-	-	-	5,72	14,09	22,11	25,56	-	-	-	1,91	4,70	7,37	8,52	11,09	13,37	20,98		0,64	1,57	2,46	2,84	3,70	4,46	6,99			
70	24,03	-	-	-	-	-	-	8,01	19,72	-	-	-	-	-	2,67	6,57	10,32	11,93	15,52	18,72	-	0,89	2,19	3,44	3,98	5,17	6,24	9,79				
100	-	-	-	-	-	-	-	11,44	-	-	-	-	-	-	3,81	9,39	14,74	17,04	22,18	-	-	1,27	3,13	4,91	5,68	7,39	8,91	13,99				
120	-	-	-	-	-	-	-	13,73	-	-	-	-	-	-	4,58	11,27	17,69	20,45	-	-	-	1,53	3,76	5,90	6,82	8,87	10,70	16,78				
150	-	-	-	-	-	-	-	17,17	-	-	-	-	-	-	5,72	14,09	22,11	25,56	-	-	-	1,91	4,70	7,37	8,52	11,09	13,37	20,98				



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