TESTING INSTRUMENTS FOR QUALITY CONTROL 🖬

# **Operating Manual**

# FX 3300 LabAir IV Air Permeability Tester



FX 330



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# 1. INTRODUCTION

# 1.1 General Description

The TEXTEST FX 3300 LabAir IV is used for fast, simple, and accurate determination of the air permeability of all kinds of flat materials and of foam cubes. The measuring range covers dense papers and airbag fabrics as well as extremely open non-wovens and forming fabrics.

The instrument works in accordance with ASTM D 737, ASTM D 3,574, ASTM C 522 (partially), BS 5,636, EN ISO 7,231, EN ISO 9,237, JIS L 1,096-A, TAPPI T 251, WSP 70.1, EN 14683 and other standards. It is suitable for laboratory use as well as for measurements directly in the production area.

## 1.2 Safety Information

- Please read this information carefully before installing and using the instrument FX 3300 LabAir IV.
- Only operate the instrument with the voltages listed on the respective type plates.
- Only use power outlets, which are properly grounded.
- Always disconnect the instrument from power before opening it.
- Only operate the instrument within the climatic conditions listed under Technical Specifications. Protect the instrument from high temperatures and humidity and avoid condensation.
- Avoid high mechanical strain on the instrument, e.g. transporting the instrument on an extremely bumpy floor.
- Avoid testing electrically conducting fabrics. Conducting dust particles may penetrate the instrument and damage the electronics or vacuum blower.
- Avoid testing wet fabrics. Water particles may penetrate the instrument and damage the electronics or vacuum blower.

TEXTEST AG cannot be held responsible for damages, resulting from use of the instrument, which is not described in this manual.

#### 1.3 Scope of Supply

- 1 Testing Instrument FX 3300 LabAir IV
- 1 Calibration check plate
- 1 Mains cable
- 1 Silicone rubber plate
- 1 Manual
- 1 USB flash drive (with FX 3300-IV EVA, FX 3300-IV PRI or FX 3300-IV WLN only)
- 10 Rolls of printing paper (with FX 3300-IV PRI or FX 3300-IV STP only)

#### 1.4 **Optional Accessories**

- FX 3300-IV EVA Evaluation Software
- FX 3300-IV PRI Integrated Strip Printer, with evaluation software
- FX 3300-IV STP Integrated Strip Printer, without evaluation software
- FX 3300-IV WLN WIFI Module, with evaluation software
- FX 3300-IV 5 Test Head 5 cm<sup>2</sup>, diameter 1" (BS 5'636)
- FX 3300-IV 5.00 Test Head 5 cm<sup>2</sup>, diameter 25.2 mm
- FX 3300-IV 10 Test Head 10 cm<sup>2</sup>
- FX 3300-IV 20 Test Head 20 cm<sup>2</sup>
- FX 3300-IV 25 Test Head 25 cm<sup>2</sup> (for foam cubes)
- FX 3300-IV 38 Test Head 38 cm<sup>2</sup>
- FX 3300-IV 100 Test Head 100 cm<sup>2</sup>

# 2. UNPACKING AND INSTALLATION

# 2.1 Unpacking

When unpacking the instrument, inspect it for transportation damage. If any transportation damage is found, report it immediately to the forwarding agent and/or to the insurance company.

# 2.2 Power connection

Connect the instrument to a clean power line.

## 2.3 Compressed air

If available, connect the instrument to a clean, oil-free compressed air source. Compressed air is not mandatory, however, without compressed air, the automatic cleaning function is less effective.

## 2.4 Start up

Switch on the instrument. The start switch is located on the right-hand side. The startup procedure takes approx. 50 seconds. During starting up, the automatic cleaning function is being executed.

## 2.5 Touch Display

Most operations and settings are done on the touch display. In order to activate a function, or to select a setting, push the appropriate area of the screen gently. Be careful as not to damage the display. Never push very strongly, and don't make the selection using a hard or pointed object.

# 3. OPERATION AND COMPONENTS

## 3.1 Description of Operation

The instrument is distinguished by its functional design and consists mainly of a clamping arm, sensor module for the air flow or pressure drop, respectively, touch display for the readout of test results and operation of the instrument. The internal vacuum blower automatically maintains the air flow according to the selected testing parameters.

The use of high precision, electronic pressure sensors guarantee for very good accuracy and very high reproducibility of the test results.

Together with the FX 3300-IV EVA Evaluation Software all internally stored test results are accessible by means of a USB drive (memory stick). Alternatively, direct access is possible through the Ethernet port or the optional WIFI module to transfer the test results to the PC, laptop or server. Data is stored in XML-format and can be further processed with e.g. EXCEL or an ordinary webbrowser. Test reports in PDF format are also available.

Additionally, a RS232 data port is available which allows direct readout of present test results.

A patented cleaning function cleans the orifice disk after each start-up of the instrument.

Following languages are selectable: German, English, French, Italian, Spanish, Chinese, Korean and Japanese.

## 3.2 Operating and control elements



# 4. MAIN MENU



with evaluation program

#### 4.1 Submenu Settings

The menu Settings allows the operator to set up the instrument according to his or her needs.



- Function Info: Shows the firmware version, IP-address, activated licenses and serial number of the instrument
- Function Brightness: Allows to adjust the brightness of the display
- Function Mode: Only available with FX 3300-IV SEQ, see chapter 7
- **Function** *Timeout*: Allows to change the default timeout for the automatic range detection in ascending direction (e.g. from range 4 to 6). Interferences from power line may cause problems to detect the correct range in automatic mode. If this is the case on your instrument, change the default timeout to e.g. 3 seconds. The factory set default value is 1.2 seconds.
- Function Language: Select your preferred language here
- Function Date/Time: Allows to set date and time. Make sure this setting is correct since the date and time appears on the test reports (if evaluation program is installed).
- **Function** *Upgrade:* A new software version can be uploaded into the instrument using a USB Memory-Stick. On the USB Memory-Stick create a folder "upgrade" in the following directory (use lower case!):

Drive Memory-Stick, e.g. Drive E: Memory-Stick (E):

- fx3300-iv

- data
- upgrade

Copy the software program file "fx3300\_upgrade\_X.X.X.tar.gz into the folder "upgrade".

Log in as supervisor and insert the USB Memory-Stick into the USB port of the instrument. Wait until a beep indicates that the USB memory-Stick has been recognized correctly (this may take a few seconds). Select the function "Upgrade" and confirm with "Yes". The instrument performs now the program update and restarts automatically.

**Important:** Never switch off the instrument while the instrument is updating. This may cause that the instrument may not be operable anymore.

• Function Touchscreen calibration: The calibration data of the touch display is stored in a permanent memory on the main PCB. In case the touch display is replaced, the touch display needs to be re-calibrated. To do so, push the button <Touchscreen Calibration>. Now a red reticule appears in the upper left corner of the display. Touch the reticule with a pointed object, e.g. a pencil. Make sure that you touch the reticule precisely in the center.

Then the reticule appears in the upper right, lower right, lower left corner and finally in the center of the display. Touch it as described before.



Should it happen that the touch display has not been calibrated properly, you can restart the touch calibration by activating the push button on the main pcb. The main pcb is mounted behind the touch display:



- Function License: The following optional accessories contain the evaluation program:
   FX 3300-IV EVA Evaluation program
   Chine program
  - FX 3300-IV STP Strip printer, without evaluation program

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Above accessories can be retrofitted anytime. However, to unlock the evaluation software or strip printer, a license needs entered in this menu.

- **Function** *Password:* Allows to change the password for the Supervisor-Mode. The default password for a new instrument is *blank.*
- **Function** *Network:* Contains all settings for Ethernet and WIFI connections. Please refer to paragraph 6.2.
- **Function** *Supervisor:* Login as supervisor to unlock all functions. A supervisor has the following additional rights: Style programming, style management, data management and configuration management. Upon delivery of the instrument, no entry of a password is required. A password can be defined in the menu *Password*.

#### 4.2 Submenu Setup

Use this menu to enter all relevant test parameters such as test pressure and unit of measure and the operation mode for the measuring range recognition.

Setup	
Unit of measure: m³/m²/min	. All
Test pressure: 200 Pa	Jul.
Auto range: Off	
$\checkmark$	×

- **Unit of measure:** Select the unit of measure according to the test standard applied. A selection of test standards can be found in paragraph 10.3.
- **Test pressure:** Select the test pressure according to the standard applied. A selection of test standards can be found in paragraph 10.3.
- **Auto range:** The instrument is capable to find the correct measuring range *automatically*. This function can be disabled with the result, that the correct measuring needs selected *manually*. Further information regarding the manual measuring range selection can be found in paragraph 5.10.

#### 4.3 Submenu Style

Skip the paragraph if no evaluation program/printer is installed.

In order to save and manage stored data, a style designation needs entered in advance. The maximum length of the style designation is 22 characters. Together with each style, test pressure, unit of measure and nominal values must be entered.

	Style				
My first s	style				
				—i	
	÷	o pat	<b>*</b>	1	×
Ok	New	Edit	Search	Delete	Esc

- Ok: Reads the selected style and returns to the Standby-Mode.
- **New:** Enter your new style, together with test pressure, unit of measure and nominal values here.
- Edit: Allows to modify parameters of an existing style. Make sure you have previously selected the corresponding style you would like to modify.
- Search: Allows to search for an existing style. Enter the first known characters and confirm with

	_	(	Er	nter					
Enter the		-	My fir						
characters here and		а	b	С	d	е	f	g	-
confirm		h	i	j	k	I	m	n	•
		0	р	q	r	S	t	u	
	Ì	v	w	x	у	z			Î
									×

- Delete: Deletes your selected style.
- Esc: Closes this menu without reading the selected style.

## 4.4 Submenu Analyze

Skip the paragraph if no evaluation program/printer is installed.

This menu allows to retrieve present test series and to print it out with the strip printer (if present). Additionally, test series can be deleted as well.

Select your style	$] \setminus$	Analyze			
	- <i>'</i>	Style			
		My first style		/ [	Confirm here
			Search		

The following window appears:

Test	report			3/7 -		Shows the number of
Style:	My first style	1	228 l/m²/s	$\left[ \right]$		test series for this style
Date:	2011-10-24	2	215 l/m²/s	4_2		,
Time: Reference:	11:58:53 TEST	3	226 l/m²/s			
Test area:	20 cm <sup>2</sup>	4	246 l/m²/s			
Test pressure: Nom/Min/Max:	200 Pa 230/220/240 l/m²/s				/	Red colored
Average:	229 l/m²/s					results
Minimum:	215 l/m²/s			1		indicate
Maximum:	246 l/m²/s			-		results being
CV :	4.86%			]		out of the
←		2		$\Rightarrow$		nominal range
	Delete Print		Previous	Next		

- Delete: Delete displayed test series.
- **Print:** If the instrument is equipped with the FX 3300-IV PRI Strip Printer, click here to print a test report.
- **Previous:** Jump to the previous test report of this style.
- Next: Jump to the next test report of this style.

#### 4.5 Submenu Data Management

Skip the paragraph if no evaluation program/printer is installed.

This menu allows to exchange data from or to an external USB drive. Make sure, a USB drive is inserted on the right side of the instrument prior to using this function. After having inserted the USB drive, a beep sound indicates that the USB drive has been recognized properly by the instrument. This may take 40 – 50 seconds.



• **Test results, Export:** Exports all existing test series to the USB drive. The test results are being stored in the folder "data":

Drive Memory-Stick, e.g. Drive E: Memory-Stick (E):

- fx3300-iv

- data
- upgrade

The storage format of a test series is as follows:

Style\_Reference\_Serialnumber\_YearMonthDay\_HourMinuteSecond.pnt.xml

resp.

Style\_Reference\_Serialnumber\_YearMonthDay\_HourMinuteSecond.pdf



• **Style, Import:** Use this function if you wish to import the style data from a back-up or another instrument. The storage format of the style data is as follows:

labair_XXXX.dat.xml	
	S
1	i

- Serial number of the instrument
- Style, Export: Use this function to export the style data. It is strongly recommended to keep the style data as a back-up since it contains all styles together with test parameters.

# 5. MEASURE

## 5.1 Condition test specimens

Prior to testing bring the test sample to equilibrium with the standard atmosphere of  $(20 \pm 2)$  °C and  $(65 \pm 2)$  % relative humidity according to ASTM D 1776 or DIN 53,802 respectively.

## 5.2 Test specimen size

Under normal conditions cutting test specimens is not necessary, because the measurements can be taken at the test sample. However, if desired so, cut specimens at least 25 cm x 25 cm (ASTM) or 20 cm x 20 cm (DIN) respectively.

Foam cubes must be cut to size as follows:

ASTM D 3,574: (51.0 ± 0.3) mm x (51.0 ± 0.3) mm x (25.0 ± 0.5) mm
EN ISO 7,231: (51.0 ± 0.3) mm x (51.0 ± 0.3) mm x (25.0 ± 0.3) mm.

## 5.3 Select test area

Select the test area in accordance with the applicable test standard:

- ASTM D 737: 38 cm<sup>2</sup>
- ASTM D 3,574: 25 cm<sup>2</sup>
- BS 5,636: 5 cm<sup>2</sup>
- EN ISO 7,231: 25 cm<sup>2</sup>
- EN ISO 9,237: 20 cm<sup>2</sup>
- JIS L 1,096-A: 38 cm<sup>2</sup>
- TAPPI T 251: 20 cm<sup>2</sup> or 38 cm<sup>2</sup>
- WSP 70.1: 5 cm<sup>2</sup>, 20 cm<sup>2</sup>, 38 cm<sup>2</sup>, 50 cm<sup>2</sup> or 100 cm<sup>2</sup>

Normally, due to the wide measuring range of the instrument, all measurements can be taken with the same chosen test area, i.e. the test head must never be changed, except:

- If a test is to be performed in accordance with a test standard requiring a test area different from the one currently used. In this case the test area prescribed in the test standard must be used.
- If an extremely dense specimen is to be tested, the air permeability of which exceeds the lower end of the measuring range of the instrument. In this case a larger test area (e.g. 100 cm<sup>2</sup>) must be used.
- If an extremely open specimen is to be tested, the air permeability of which exceeds the upper end of the measuring range of the instrument. In this case the test must be performed with a smaller test area. (This case is very unlikely, because the FX 3300 LabAir IV is able to measure even an extremely high air permeability).

The instrument automatically recognizes the area of the installed test head and converts the test results accordingly. It is, however, to be noted, that test results obtained with different test areas are not always directly comparable. Therefore, for comparison of the air permeability of different test specimens, the tests should be performed with the same test area.

The correct sequence for changing the test head is as follows:

- Disconnect the rubber tube from the clamping ring.
- Lift the latch of the test head snap closure and pull out the upper clamping ring.
- Pull out the test head from the instrument. Disconnect the rubber tube from the test head.
- Connect the rubber tube to the new test head and insert the test head into the instrument. **Make sure not to squeeze or bend the rubber tube!**
- Push the new clamping ring assembly onto the clamping arm and engage the clamping ring with the snap closure.
- Re-connect the rubber tube to the clamping ring. Make sure the rubber tube is not bent or squeezed!

After each change of the test head it is recommended to perform an air tightness test as described in paragraph 8.2.

#### 5.4 Enter/Select Style

Skip this paragraph if no evaluation program is installed.

Enter a new style or select an existing style according to paragraph 4.3. Test pressure and unit of measure of the current test will be configured automatically according to the parameters stored together with the corresponding style.

#### 5.5 Select test pressure

Skip this paragraph if using a style.

Select the test pressure according to paragraph 4.2.

•	ASTM D 737:	125 Pa (= 0.5" w.c.)
•	ASTM D 3,574:	125 Pa (= 0.5" w.c.)
•	BS 5,636:	98 Pa
•	EN ISO 7,231:	125 Pa (= 0.5" w.c.)
•	EN ISO 9,237:	
	apparel fabrics:	100 Pa
	industrial fabrics:	200 Pa
•	JIS L 1,096-A:	125 Pa (= 0.5" w.c.)
•	TAPPI T 251:	125 Pa (= 0.5" w.c.)
•	WSP 70.1:	100 Pa to 200 Pa, other test pressures may
		be used

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#### 5.6 Select unit of measure

Skip this paragraph if using a style.

Select the unit of measure according to paragraph 4.2

• ASTM D 737: ft³/ft²/min

dm<sup>3</sup>/s

dm<sup>3</sup>/s

cm<sup>3</sup>/cm<sup>2</sup>/s

mm/s (=  $I/m^2/s$ )

- ASTM D 3,574:
- ASTM C 522: mks rayl or cgs rayl
- BS 5,636:
- EN ISO 7,231:
- EN ISO 9,237:
- JIS L 1,096-A:
- TAPPI T 251:
- WSP 70.1:

cm<sup>3</sup>/cm<sup>2</sup>/s ft<sup>3</sup>/ft<sup>2</sup>/min or cm<sup>3</sup>/cm<sup>2</sup>/s mm/s, ft<sup>3</sup>/ft<sup>2</sup>/min, cm<sup>3</sup>/cm<sup>2</sup>/s, l/m<sup>2</sup>/s, l/dm<sup>2</sup>/min, m<sup>3</sup>/m<sup>2</sup>/min, m<sup>3</sup>/m<sup>2</sup>/h or dm<sup>3</sup>/s

#### 5.7 Reset to zero



Briefly push the RESET key to reset the pressure sensors to zero.

**Note**: It is essential to reset the sensors while the test head is open (without specimen) and the vacuum pump is at a complete stop! Violation of this direction may result in coarse measuring errors!

#### 5.8 Load test specimen

Place the test specimen, free from tension, across the test head:

- **Position of test points**: Place the test points evenly and diagonally over the sample, so that each test point includes different warps and wefts. The test points should be at least two to three meters away from the end of the sample and should not be closer than 10 cm to the selvage. At certain materials, where the evenness of air permeability is critical over the entire width (for example at parachutes fabrics), the selvage area must be included in the test. Avoid tests on creases and defects.
- **Number of test points**: Normally, at least 5 measurements are to be on each test sample. Additional measurements may be required due to statistical necessities (see DIN 53,803).
- **Coated specimens**: Coated specimens must be clamped with the coated side *down*!

#### 5.9 Start test

Start the test by pressing down the clamping arm. The test specimen is clamped to the test head and the vacuum pump is automatically started.

#### 5.10 Select measuring range

Skip this paragraph if Auto Range is activated.

The instrument displays whenever the measuring range is correct or needs changed:



With the left or right red keys select the measuring range so that the middle range indicator stabilizes into *green*.

- Left red zone: If the range indicator is in the lower red zone, the test result is *only an approximation*. Select the next lower measuring range. However, in measuring range no. 1, test results taken in the lower red zone may be accepted as approximate test results.
- **Right red zone**: If the range indicator is in the upper red zone, the test result is *uncertain* and may be *grossly wrong*! Avoid taking measurements in the upper red zone. Select the next higher measuring range.

#### 5.11 Read/transmit test result

A test result is valid, after the middle range indicator has turned from blue to green and the display stabilizes. The air permeability of the test specimen is displayed in the selected unit of measure, rounded to three significant digits. Read and record the displayed value.

In case the instrument is connected though the RS232 serial data port with a PC with the evaluation software L 5110 LABODATA III, transmit the test result now.

In case a FX 3300-IV STP/PRI strip printer or the FX 3300-IV EVA evaluation software is installed, you may save the test result.



#### 5.12 Terminate test

Terminate the test by pressing down the clamping arm. The clamping arm lifts off the test head, the vacuum pump is shut off and the test specimen is released. It can now be removed from the instrument or it can be moved to the next test position.

In case the test result has been saved, the following, unfinished report appears:

Test r	eport			
Style: Test area: Test pressure: Average: Minimum: Maximum: CV :	My first style 20 cm² 200 Pa 3120 l/m²/s 3120 l/m²/s 3120 l/m²/s 		3120 l/m²/s	Your first result
Delete all	Delete	Digt		

In case the result has not been saved, the instrument returns to Standby Mode.

#### 5.13 Conduct additional tests

Conduct any additional tests according to the same procedure.

An active test report will be temporarily blanked out while measuring. Save the test result again, and repeat additional tests as many times required. After each release of the clamping arm, the rest report adds the last result and shows the statistical analysis.



After all test results have been recorded, you can either print a test report (with strip printer only), save the test report (with evaluation program only) or return to the standby menu without saving. In case the test report has been saved, it can be easily retrieved through Ethernet or WIFI using a regular web-browser. The internal web-server allows to display the test report using a standard web-browser. Alternatively, since the data format of the test report is stored in XML format, the test results can be further processed with EXCEL or many other programs. Further information's can be found in paragraph 6.3.

If you wish to display an old test report on the instrument, please proceed according to paragraph 4.4.

#### 5.14 Test breaks

During test breaks cover the test area with the rubber plate supplied with the instrument to protect the vacuum system from dust.

During test breaks you may leave the instrument switched on with the clamping arm up (i.e. with the vacuum pump shut off) for an extended period of time. The power consumption of the idle instrument is minimal, and to leave the instrument on saves the waiting time when the instrument is switched back on, until the zero point of the pressure sensors has stabilized. However, *never* leave the instrument on for an extended period of time with the vacuum pump running! The vacuum pump could be seriously damaged.

## 5.15 Lateral air flow

When measuring the air permeability of certain thick or dense test specimens, the lateral air flow through the clamping area may represent a significant share of the total air flow and may distort the test result. In such a case the same test specimen is to be measured twice at each spot: once in the normal way and once covered with a thin piece of plastic. The air permeability of the test specimen is calculated from the differential of these two test results.

If the instrument is connected to a PC with the L 5110 Evaluation Program LABODATA III, the lateral air flow of the test specimen may be determined once per series of tests and may automatically be subtracted from every test result in that series of tests. The test report then shows the "net" air permeability.

### 5.16 Function and calibration test

From time to time, but at least once a day, check the proper function and calibration of the instrument by performing the function and calibration test described in paragraph 8.1.

### 5.17 Air tightness test

From time to time check the vacuum system of the instrument for air tightness by performing the air tightness test described in paragraph 8.2.

# 6. DATA MANAGEMENT

#### 6.1 Scope

Data management is possible if the FX 3300-IV EVA Evaluation Program is installed on the instrument. The PC, however, requires no further program except a web-browser. If you wish to exchange data through a USB drive, please proceed according to chapter 4.5.

Alternatively, transfer of present test results is also possible through the RS232 Serial Data Port together with L 5110 LABODATA III. If you use LABODATA, please refer to the LABODATA operating manual and skip this chapter.

The instrument has a web-server installed which allows to:

- Export test series from instrument to PC
- Export style data from instrument to PC
- Import style data from PC to instrument
- Delete test series on instrument
- Delete styles on instrument

The PC can be connected via Ethernet or WIFI, but not simultaneously.

#### 6.2 Integration into network

Integration of the instrument into your network should be performed by your IT-administrator. Select the menu *Settings* => *Network:* 



- **Network Settings:** Allows to configure static IP-addresses and to enable or disable the DHCP mode.
- Wireless Settings: Allows to select the security mode: None, WEP, WPA, WPA2-PSK

• **FTP Client:** In this menu you select if you want to activate the FTP Client in the LabAir. Enable the FTP Client if you wish to transfer the test results in *PDF*- and *XML-format* immediately after the test via the network to a server or a PC. In order to utilize the options of the data transfer via the network, you need to install on your PC or Server an FTP-server software for receiving data from the LabAir. There are many different types of FTP-software packages on the market.



**Server IP:** In this menu you enter the IP-address of the PC or the Server, to which you wish to connect.

**User Name:** As explained already, an FTP server software must be installed on the PC or Server. In this menu you enter the "User name", which you also have assigned to the FTP-Server on your PC.

**Password:** In this menu you enter the "Password", which you have assigned to the FTP-Server on your PC.

**Sub Directory:** Using a subdirectory structure allows to transfer test data from different LabAir's in your factory into different subdirectories. If you e.g. have programmed your FTP-server such that it stores the received data in the folder C:\LABAIR you can generate several subdirectories in the folder C:\LABAIR, e.g. referring to the serial number of the LabAir or referring to a specific production system, where you are using a specific LabAir. Enter the name of such a subdirectory using this menu. This will make sure that the test data from a specific LabAir are transferred into the selected subdirectory to your PC or Server.

• FTP Server: In order to utilize the options of the data transfer via the network, you need to install on your PC or Server an FTP-Client software for uploading data to the LabAir. There are many different types of FTP-software packages on the market.

FTP Serve	er	
Anonymous Login	Disabled	× ×
User Name	fx3300	Jose -
Password	****	J.C.
		Esc

**Anonymous Login:** In this menu you select if you want to access the FTP-server in the LabAir anonymously that means without applying a user name and a password. For safety reason we strongly recommend to set the "Anonymous login" to yes and enter a "User name" and "Password as described below.

**User name:** In this menu you enter the "User name", which you have assigned to the FTP-Client on your PC.

**Password:** In this menu you enter the "Password", which you have assigned to the FTP-Client on your PC.

#### 6.3 Access to instrument via network

After the network settings have been configured correctly, you may have access to the instrument.

**Important:** The instrument must be in standby mode whenever access through network is desired. If this is not the case, an error message will inform the user on the PC that access has not been granted.

Before you open your web-browser, make sure you have noted the correct IP address of the instrument. The IP address can be found as follows:



Open your web-browser and enter the IP address:



**Important:** For full access to all functions, login as supervisor. The password is identical to the supervisor password of the instrument (which is void upon delivery of a new instrument).

#### • Open a test report:

Measure Style Logs He Measure	Ip Configuration Logout		Alternatively, click here to open the test report in PDF format
	Toet rosults	Test protocol	
My first style NF 00100 20	111212_094332.pnt.xml		
TFE_00100_20111208_095	005.pnt.xml		
Delete Delete all	ne to PC Export		
Export test results (XML) from Machi	ne to PC Export		
			_
	Select your test	t report	

Click on the report you wish to open. The data format is as follows:





The test report is now being displayed:

IN	EX stru	Static Air Permeability	
Basic l	Data		
Style:		My first style	
Refere	nce:	TEST	
Date:		24.10.2011	
Time:		11:58:53	
Instru	nent:	FX 3300-IV LabAir	
Serial	Number:	100	
Setting	15		
Test pr	essure:	200 Pa	
Test an	ea:	20 cm <sup>2</sup>	
Statist	ic analys		
Averag	e:	229 l/m2/s	
Minimu	m	215 l/m2/s	
Maxim	um:	246 l/m2/s	
CV:		4.87 %	
Test re	sults		
1	228 l/m2/s		
2	215 l/m2/s		
3	226 l/m2/s		
4	2461/m2/s		

You can now print the test report, usually by clicking the right button of your mouse.

Manage your test reports:

•



**Important:** The export function transfers all existing test result packed in one data file. For further processing, the data file needs extracted. The file format is Zip.

Manage your styles: Edit the testing parameters of your style Select the style you TEXTEST Select data path wish to of your style INSTRUMENTS data you wish to delete import to the instrument Style Create a Style name Edit new style P first style After correct data path setting New Delete Delete all for the style data, execute Send Import Styles from PC to Machine Durchsuchen.. transfer to Export Styles from Machine to PC Export instrument Export style, it can be saved to any folder in your network system

In this menu, you can create, delete or modify your styles. Additionally, you can export your styles from the instrument to the PC. This is very useful if you wish to copy all styles from one instrument to another. Furthermore, it is recommended to keep your style data as a backup.

The data format of the style data is as follows:

Labair\_XXXX.dat.xml

TEXTEST AG, CH-8603 Schwerzenbach, Switzerland, info@textest.ch



• Insert your personalized company logo and company name:

TEXTEST		
Measure Style Logs Help	Configuration Logout	Enter data path of
Configuration		company
Insert company logo	Durchsuchen Send	logo nere
Insert company name	Send	Transfer
Last Update 2011-11-08 info@textest.ch		company logo here

You can insert your company logo and/or your company name in the menu "Configuration". The file format for the company logo is *JPEG* or *PNG*. The file size must not exceed 64kB.

The logo as well as the company name appears in the header of the test report (in PDF format only).



#### 6.4 Alternative: Connection to network via internal server of instrument

Alternative to the webbrowser (chapter 6.3), you can connect the instrument so that it appears as a network drive. This allows to handle the data with the MS explorer. First, make sure the instrument is connected to your network (chapter 6.2).

After connection of the instrument is established, connect network drive. Depending on the Windows version, this needs to be done in different manner. The following example shows Windows 10 (German edition).

OneDrive Dieser PC Netzwerk e following wi	165 GB frei von 223 GB       1.56 GB frei von 13.5 GB       43.5         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: Metzwerkadhessen (1)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)         Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)       Image: DVD-RW-Laufwerk (F:)	utton work
Dieser PC Netzwerk  following wi	DVD-RW-Laufwerk (F:)         Vetzwerkadtessen (1)         daten         (\texsrv02.texdom.local (P:)         Click here with right mouse be and select «Connect with net drive"         indow should open:         werk verbinden	utton work
Petzwerk	Netzwerkadiesen (1) daten (\texsrv02.texdom.loss() (P:) Click here with right mouse b and select «Connect with net drive" indow should open:	work
e following wi	Netzwerkadnessen (1) daten (Vtexsrv02.texdom.local (P:) Click here with right mouse b and select «Connect with net drive" indow should open:	work
e following wi	Indow should open:	work
e following wi	Click here with right mouse b and select «Connect with net drive"	work
e following wi	indow should open:	×
e following wi	indow should open:	×
🔏 Netzlaufv	werk verbinden	×
Netzlaufi	werk verbinden	
Netziauti	werk verbinden	
Bestimmen S hergestellt w Laufwerk:	Sie den Laufwerkbuchstaben für die Verbindung und den Ordner, mit dem die Verbinverden soll:	dung
Ordner:	\\10.198.1.207\export V Durchsuchen	
	Beispiel: \\Server\Freigabe	
	🗹 Verbindung bei Anmeldung wiederherstellen	
	Verbindung mit anderen Anmeldeinformationen herstellen	
	Verhindung mit einer Wehsite herstellen auf der Sie Dokumente und Bilder sneiche	
	können	<u> </u>

Enter as network path: \\X.X.X.X\export (X=IP address of the instrument)

The access data is as follows:

User:	admin
Password:	1234

You should now have access to the drive:



The content of the drive looks like this:

<ul> <li>Schnellzugriff</li> <li>Desktop</li> <li>Downloads</li> <li>Dokumente</li> <li>Bilder</li> <li>Rere Vorlagen</li> <li>MUB Messunsi</li> <li>PP Prüfprotoko</li> <li>OneDrive</li> <li>Dieser PC</li> <li>Netzwerk</li> </ul>	* * 8.1.2( cherl	<ul> <li>4711_1_00164_20180312_085622.pnt</li> <li>4711_00164_20180312_085622</li> <li>PETER_A_00164_20180312_090953</li> <li>PETER_A_00164_20180312_090953.pnt</li> </ul>	12.03.2018 09:56 12.03.2018 09:56 12.03.2018 10:09 12.03.2018 10:09	XML-Dokument Adobe Acrobat D Adobe Acrobat D XML-Dokument	1 KB 13 KB 13 KB 1 KB	
> 💣 Netzwerk						

You can now copy or delete your test results.

# 7. SEQUENCE MODE

## 7.1 General

The optional software module FX 3300-IV SEQ allows programming of automatic pressure or velocity sequences. With this option, it is possible to record up to 10 pair of results together with the corresponding Rayl and NLF values.

For the use of the sequence mode, it is mandatory to configure the instrument accordingly. First, log in as *Supervisor* and select the function *Mode*.



For the measurement of sequences, a style has to be defined first. All required parameters are assigned to the style and will be loaded whenever the style is selected. In the list of styles, only "sequence mode" styles will be visible. Note that new styles only can be entered on touch screen of the instrument.



C	Style	$\supset$			
No style ABC Mein erste MLKJ MMMMM My first st	er Artikel yle				
Ok	New	Edit	Search	Delete	Esc

- Select "New" to enter a new style
- Select "Edit" to change a style
- Select "Delete" to delete the style which is highlighted on the list

#### 7.2 Enter a new style



**Menu "Style":** Enter your style designation. **Important:** Equal style designation between "Standard" and "Sequencer" mode is not permitted.

**Menu "Parameter":** Select "Pressure drop" if a sequence should be performed at fixed pressure drops. The results will be recorded as "Test velocity" in the corresponding "Unit of measure".

Select "Test velocity" if a sequence should be performed at fixed test velocities in the corresponding "Unit of measure". The results will be recorded as "Pressure drop" in Pa.

Menu "Unit of measure": Select the unit of measure for the test velocity.

• Select "Next" to open the next menu.

Enter your sequences:

Edit sty	le		Tap here to enter a new sequence
Sequence	Pressure drop (Pa)		
1	100 Pa		
2	200 Pa		
3	300 Pa		
4	400 Pa	_الل	Tan hara ta dalata a
5	500 Pa		highlighted
6	600 Pa		sequence
7	700 Pa		
Ok	Previous Next	Esc	

In this example, "Pressure drop" is entered as parameter.

• Select "Next" to open the next menu



Each sequence supplies a pair of values (pressure drop and test velocity). These pair of values can be used for the calculation of the Rayl- and NLF- number.

It is:

mks Rayl = 1000 
$$\frac{p}{v}$$
 or cgs Rayl = 100  $\frac{p}{v}$ 

p: Pressure drop [Pa]

v: Test velocity in [mm/s] or [l/m<sup>2</sup>/s]

$$NLF = \frac{Rayl2}{Rayl1}$$

Rayl1: Rayl-Number of 1st measurement

Rayl2: Rayl-Number of 2nd measurement

• Select "Ok" to close the menu

#### 7.3 Start of a sequence measurement

From the list in the menu "Styles", select your style and attached your test sample onto the test head. Push down the clamping arm. The sequences are now being performed fully automated. After all results have been recorded, the following message appears:



Confirm to review your results:

(	Meas	ure				11:06:22 23.02.18		
								Tap here to scroll
Seq.	Pressure drop	Test velocity	Rayl	NLF 1	NLF 2		1	
3	300 Pa	442 mm/s	67.7 cgs rayl	1.16	-		-/	
4	400 Pa	510 mm/s	78.2 cgs rayl	1.10	4			
5	500 Pa	568 mm/s	88.2 cgs rayl	1.10	2.76		/	
6	600 Pa	622 mm/s	96.7 cgs rayl	1.10	4			
7	700 Pa	668 mm/s	105 cgs rayl	1.09				
Setti		i				H Save		

Two NLF numbers are available:

- NLF 1: Ratio of 2 sequential Rayl numbers
- NLF 2: Ration of last and first Rayl number
- ⇒ Close the menu with the "Save" button. In case you do not want to save the results, you may now reject the results. Alternatively, confirm with "Yes" and enter your reference (if applicable).
- $\Rightarrow$  Press down the clamping arm to release you test sample.

## 7.4 Evaluation of the sequence reports

The results can be downloaded as XML- or PDF- data file. First, make sure your instrument is connected to your PC or network according to chapter 6.2.

If your instrument is connected, you may download the results:



The test report looks like this:



# 8. FUNCTION CHECKS

### 8.1 Function and calibration check

From time to time, but at least once a day, check the proper function and calibration of the instrument by means of the calibration check plate:

- Select unit of measure and test pressure: Select the unit of measure and the test pressure shown on the calibration check plate.
- Load calibration check plate: Place the calibration check plate flat onto the test head and make sure the small pin located at the rear of the clamping ring rests in the corresponding groove of the calibration check plate.
- Start test: Start a test by pressing down the clamping arm.
- **Select measuring range**: Make sure, the function *Autorange* is deactivated. Normally, the calibration check plate can be measured in two adjacent measuring ranges. Successively select both of these measuring ranges.
- **Check test result**: In both cases, the instrument must display the air permeability shown on the calibration check plate, with a maximum tolerance of ± 3 %. If the displayed air permeability differs by more than this tolerance from the nominal air permeability of the calibration check plate, this may have the following reasons:
  - **Check plate incorrectly mounted**: Check that the calibration check plate is placed flat onto the test head.
  - **Check plate not clean**: Check that the calibration check plate is perfectly clean. Carefully clean the holes in the calibration check plate with compressed air, without scratching the check plate. Also clean the black rubber gasket of the check plate.
  - **Dust filter clogged**: Check, and if necessary clean, the dust filter in accordance with paragraph 9.1.
  - **Instrument problem**: Check that the instrument recognizes the test area correctly, and that none of the rubber hoses is bent. For details see chapter 4.
  - **Air leak**: Check the air tightness of the vacuum system of the instrument in accordance with paragraph 8.2.

If none of the above measures corrects the problem, the instrument is defect and needs repair.

#### 8.2 Air tightness test

From time to time check the air tightness of the vacuum system of the instrument:

- Select test parameters: Select the test pressure and the unit of measure for the air permeability normally used for testing.
- Select test head: Mount the test head normally used for testing.
- **Select measuring range**: Make sure, *Autorange* is deactivated. Select measuring range no. 8.
- Load rubber plate: Place the rubber plate supplied with the instrument flat onto the test head. Make sure the rubber plate and the test head are completely clean and free from dust and lint.
- **Start test**: Start a test by pressing down the clamping arm. Read the test result after the display has stabilized.
- **Change measuring range**: Successively select measuring ranges 7 through 1. Each time wait until the display has stabilized, and then read the test result
- Change test head: Repeat the air tightness test with all other test heads available.
- **Check test result**: In all measuring ranges and with all test heads the displayed air "leakage" must be less than 1 % of the minimum air permeability normally measured at the particular test pressure and with the particular test head. If a higher value is displayed, this may have the following reasons:
  - **Rubber plate mounted incorrectly**: Check that the rubber plate lies completely flat on the test head.
  - **Rubber plate not clean**: Check that the rubber plate is completely clean and free from dust and lint.
  - **Hose not connected**: Pull the clamping ring from the clamping arm, and pull the test head from the instrument. Check that the silicone rubber hose leading to the underside of the test head is properly connected to the test head. After changing the test head this may have gotten forgotten.
  - **Orifice disk not clean**: Check that no fiber and dust particles have accumulated between the orifice disk (drawing TT 3300-4-300, item 76) and the two Nylon gaskets (drawing TT 3300-4-300, items 133+149) riding on the disk. Clean the orifice unit in accordance with paragraph 9.2.

If none of the above measures corrects the problem, the instrument is defect and needs repair.

# 9. MAINTENANCE

**Warning!** When performing repair or maintenance work on the instrument with the covers taken off, be extremely cautious and aware of the electrical hazards! Only qualified personnel should work on the open instrument.

The FX 3300 LabAir VI requires very little maintenance. Regular cleaning of the dust filter and of the orifice unit is generally sufficient for problem-free operation over many years:

## 9.1 Cleaning of the dust filter

From time to time check the dust filter and clean it if necessary:

- **Remove clamping ring**: Disconnect the silicone rubber tube from the clamping ring and loosen fast lock device. Pull the clamping ring from the clamping arm.
- **Remove test head**: Pull out the test head from the instrument. Disconnect the silicone rubber tube from the test head.
- **Remove dust filter**: Remove the dust filter (drawing TT 3300-4-300, items 39-42) from the instrument.
- Clean dust filter: Clean the dust filter with compressed air. Also clean the tube (drawing TT 3300-4-300, item 27) from which the dust filter has been removed. Important: Do not use compressed air inside the tube!
- Insert dust filter: Re-insert the cleaned dust filter into the instrument.
- **Mount test head**: Connect the silicone rubber tube to the test head and re-insert the test head into the instrument. **Make sure not to squeeze or bend the rubber tube!**
- **Mount clamping ring**: Push the clamping ring back onto the clamping arm and secure it in place. Re-connect the silicone rubber tube to the clamping ring, and make sure the rubber tube is not bent!

#### 9.2 Cleaning of the orifice unit

From time to time clean the orifice unit, in particular if the vacuum system of the instrument has a leak:

- **Switch off instrument**: With the power switch, switch off the instrument.
- **Remove covers**: Remove the right front and rear covers from the instrument.
- Clean Nylon gaskets: Using a finger nail, slightly lift the white Nylon gasket (drawing TT 3300-4-300, item 133) riding on the orifice disk (drawing TT 3300-4-100, item 76). Soak a piece of thin cardboard (for example a name card) in gasoline, alcohol, or acetone, and push it between the gasket and the disk. Manually turn the orifice disk so that the cardboard is pulled all the way under the Nylon gasket and back out at the opposite side. The goal is to remove all dust and lint particles, which may have accumulated on the gasket.
- Clean orifice disk: Carefully clean both sides of the orifice disk (drawing TT 3300-4-300, item 76) with gasoline, alcohol, or acetone. Afterwards clean all eight orifices of the orifice disk with compressed air. It is imperative that the orifice disk and the orifices are completely clean and free from dust, grease, lint, and residues from the cleaning agent! Note: Be very carefully not to scratch the orifices nor the disk. A scratched orifice or orifice disk causes measuring errors and must be replaced!
- **Re-mount covers**: Re-mount the right rear cover to the instrument.
- Conduct air tightness test: Conduct an air tightness test in accordance with paragraph 8.2.

# 10. INFORMATION ABOUT AIR PERMEABILITY

# 10.1 Conversion table for units or measure

	mm/s	l/m²/s	l/dm²/min	cm <sup>3</sup> /cm <sup>2</sup> /s	ft³/ft²/min	m³/m²/s	m³/m²/min	m³/m²/h
1 mm/s =	1,00	1,00	0,600	0,100	0,197	0,00100	0,0600	3,60
1 l/m²/s =	1,00	1,00	0,600	0,100	0,197	0,00100	0,0600	3,60
1 l/dm²/min =	1,67	1,67	1,00	0,167	0,328	0,00167	0,100	6,00
1 cm <sup>3</sup> /cm <sup>2</sup> /s =	10,0	10,0	6,00	1,00	1,97	0,0100	0,600	36,0
1 ft <sup>3</sup> /ft <sup>2</sup> /min =	5,08	5,08	3,05	0,508	1,00	0,00508	0,305	18,3
1 m <sup>3</sup> /m <sup>2</sup> /min =	16,7	16,7	10,0	1,67	3,28	0,0167	1,00	60,0
$1 \text{ m}^3/\text{m}^2/\text{h} =$	0,278	0,278	0,167	0,0278	0,0547	0.000278	0,0167	1,00

# **10.2** Conversion table for pressure

	Ра	mbar	cm w.c.	in w.c.	psi
1 Pa =	1,00	0,0100	0,0102	0,00402	0,000145
1 mbar =	100	1,00	1,02	0,402	0,0145
1 cm w.c. =	98,1	0,981	1,00	0,394	0,0142
1 in w.c. =	249	2,49	2,54	1,00	0,0361
1 psi =	6900	69,0	70,3	27,7	1,00

## **10.3** International standards for air permeability

Standard	Country or application	Test area	Test pressure	Unit of measure
AFNOR G 07-111	France	20 cm <sup>2</sup> or 50 cm <sup>2</sup>	196 Pa	l/m²/s
DIN 53'887	Germany	20 cm <sup>2</sup>	200/160/100 Pa	l/m²/s or l/dm²/min
EDANA 140.1	Nonwovens	20 cm <sup>2</sup> or 50 cm <sup>2</sup>	196 Pa	l/m²/s
EN ISO 9'237	International	20 cm <sup>2</sup>	200/100 Pa	mm/s (= l/m²/s)
TAPPI T 251	Paper	20 cm <sup>2</sup> or 38 cm <sup>2</sup>	125 Pa	ft³/ft²/min or cm³/cm²/s

#### 10.4 Determination of the air permeability at any pressure differentials

The velocity of the air traveling through a porous material (or "air permeability") AP depends on the pressure differential p as follows:

$$AP = A \cdot p^{E}$$

It is:

=	velocity or "air permeability"
=	material constant
=	pressure differential
=	exponent of the air permeability curve.
	= = =

Determine the air permeability  $AP_1$  and  $AP_2$  of the test specimen at two distinctly different test pressures  $p_1$  and  $p_2$ . From these two test results calculate the exponent E of the air permeability curve as follows:

$$E = \frac{\log(AP_2 / AP_1)}{\log(p_2 / p_1)}$$

If the two test pressures  $p_1$  and  $p_2$  are selected so that they differ exactly by a factor of 10 (for example  $p_1 = 100$  Pa and  $p_2 = 1,000$  Pa), log ( $p_2/p_1$ ) is equal to "1" and the above algorithm is simplified to:

$$E = \log(AP_2 / AP_1)$$

The curve exponent is a material constant. In the vast majority of all cases it varies between 0.5 and 1.0.

By means of the curve exponent E the air permeability  $AP_3$  at any other pressure differential  $p_3$  may be calculated from any one of the two original test results with a fair degree of accuracy as follows:

or:  
$$AP_{3} = AP_{1} \cdot (p_{3} / p_{1})^{E}$$
$$AP_{3} = AP_{2} \cdot (p_{3} / p_{2})^{E}$$

# 11. SERIAL DATA PORT

The character code is ASCII, with 1 start bit, 8 data bits and 2 stop bits, without parity and without protocol. The baud rate is 9,600 baud.

The pin layout of the female 9-pin Sub-D connector at the rear of the instrument is:

- pin 2: request for data RD
- pin 3: data line TD
- pin 5: ground.

When the instrument receives a "CR" character (Hexadecimal "0D") as request for data through pin 2 of the data port, a 60-character ASCII string is transmitted through pin 3. The format of this string is as follows:

1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
SC	;	II	II		II	II	II	- 11	SN	SN	SN	SN	VP1	VP1	VP1	VP1	VP1
18		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
VP1	1	UP1	ZP2	ZP2	ZP2	ZP2	ZP2	ZP2	UP2	BL	BL	BL	BL	BL	BL	BL	BL
35		36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
BL		BL	BL	BL	BL	BL	WS	TR1	TR1	TR1	TR1	TR1	TR1	UR1	BL	BL	BL
								1		1							
52		53	54	55	56	57	58	59	60								
BL		BL	BL	BL	BL	TF	CS	EC1	EC2								
SC	=	Star	rt chai	acter:							He	kadeci	imal "′	1E"			
11	=	Inst	rumer	nt iden	tifier						"FX	3300	"				
SN	=	Seri	ial nur	nber c	of the	instrur	nent										
VP1	=	Tes	t pres	sure, i	right a	djuste	d										
UP1 = Unit of measure of the test pressure "Pa": Hexadecimal "3F" = ASCII "?"																	
ZP2	=	Tes	t area	, right	adjus	ted, w	ith flo	ating o	decima	al poir	nt						
UP2 = Unit of measure of the test area "cm <sup>2</sup> ":									0	100							
UP2	=	Unit	t of me	easure	e of th	e test	area '	'cm²":			He	kadec	mal "2	29" :	= ASC	лг»"	
UP2 BL	= =	Unit Blar	t of me nk	easure	e of th	e test	area '	'cm²":			He	kadec	mal "2	29" :	= ASC	лг")"	
UP2 BL WS	= = =	Unit Blar War	t of me nk rning s	easure signal:	e of th	e test	area '	'cm²":			He	kadec	mal "2	29" =	= ASC	;II ")"	
UP2 BL WS	= = =	Unit Blar War Tes	t of me nk rning s t resu	easure signal: It is in	e of th the u	e test oper re	area ' ed zoi	'cm²": ne:			He> He>	kadeci kadeci	imal "2 imal "2	29" = 2A"	= ASC = AS	SCII ")	k 11
UP2 BL WS	= =	Unit Blar War Tes Tes	t of me nk rning s t resu t resu	easure signal: It is in It is in	e of th the u the lo	e test pper re wer re	area ' ed zoi ed zor	rcm²": ne: ie:			He> He> He>	kadeci kadeci kadeci	mal "2 mal "2 mal "2	29" = 2A" 75"	= ASC = AS = AS	SCII ")" SCII "' SCII "'	۰. ۲
UP2 BL WS	= =	Unit Blar War Tes Tes Tes	t of me nk rning s t resu t resu t resu	easure signal: It is in It is in It is in	the up the lo the g	e test oper ro wer re reen z	area ' ed zor ed zor one:	rcm²": ne: ne:			He> He> He> He>	kadeci kadeci kadeci kadeci	mal "2 mal "2 mal "7 mal "2	29" = 2A" 75" 20"	= ASC = AS = AS = AS	SCII ")" SCII "' SCII "I SCII "	" "

UR1 = Unit of measure of the test result:

		I/m²/s:	Hexadecimal "55"	= ASCII "U"
		l/dm²/Min:	Hexadecimal "56"	= ASCII "V"
		cm <sup>3</sup> /cm <sup>2</sup> /s:	Hexadecimal "57"	= ASCII "W"
		m³/m²/Min:	Hexadecimal "58"	= ASCII "X"
		m³/m²/h:	Hexadecimal "59"	= ASCII "Y"
		ft³/ft²/min:	Hexadecimal "53"	= ASCII "S"
		mm/s:	Hexadecimal "48"	= ASCII "H"
		dm³/s:	Hexadecimal "54"	= ASCII "T"
		Pa:	Hexadecimal "3F"	= ASCII "?"
		mks rayl:	Hexadecimal "4D"	= ASCII "M"
		cgs rayl:	Hexadecimal "6A"	= ASCII "j"
		Pa/cm <sup>2</sup> :	Hexadecimal "6B"	= ASCII "k"
TF	=	Data transfer flag:		
		Data have not yet been transferred:	Hexadecimal "30"	= ASCII "0"
		Data have already been transferred:	Hexadecimal "31"	= ASCII "1"
CS	=	Check sum, consisting of the lower eight bits of the	sum of byte 1 throug	h byte 57
		(both included)		
EC1	=	End character 1:	Hexadecimal "0D"	= ASCII "CR"
EC2	=	End character 2:	Hexadecimal "0A"	= ASCII "LF".

# 12. TECHNICAL SPECIFICATIONS

•	Measuring range:	0.4 1 0.6 0.002 0.1 0.05 0.03 2 0.1 20	···· ···· ···· ····	750 10,000 6,000 20 1,300 700 400 24,000 1,600 2,500	$cm^{3}/cm^{2}/s$ mm/s (I/m <sup>2</sup> /s) I/dm <sup>2</sup> /min dm <sup>3</sup> /s ft <sup>3</sup> /ft <sup>2</sup> /min cm <sup>3</sup> /cm <sup>2</sup> /s m <sup>3</sup> /m <sup>2</sup> /min m <sup>3</sup> /m <sup>2</sup> /h 38 cm I/dm <sup>2</sup> /min Pa at 1 - 10,000	5 cm <sup>2</sup> 20 cm <sup>2</sup> 20 cm <sup>2</sup> 25 cm <sup>2</sup> 38 cm <sup>2</sup> 38 cm <sup>2</sup> 38 cm <sup>2</sup> 2 100 cm <sup>2</sup> 0 mm/s (20 cm <sup>2</sup> )	
•	Unit of measure:	mm/s, ft³/ft²/min, cm³/cm²/s, l/m²/s, l/dm²/min, m³/m²/min, m³/m²/h, dm³/s, Pa, mks rayl, cgs rayl					
•	Measuring accuracy:	better th	nan ±	: 3 % of th	e displayed valu	le	
•	Test pressure:	20 throu	igh 2	,500 Pa (	0.08 through 10'	' w.c.)	
•	Test head / test area:	5, 20, 2	5, 38	and 100	cm²		
•	Data ports:	<ul> <li>RS 232 C, asynchronous, bi-directional</li> <li>Ethernet 100BASE-TX, IEEE 802.3u</li> <li>WIFI 820.11g/b, WEP, WPA/WPA2-PSK, (optional)</li> <li>USB 2.0, for USB flash drive</li> </ul>					
•	Display:	Resolution 640x480, LED Backlight, 256k colors, brightness 280 cd/m², resistive touch					
•	Memory space:	8 GB or (approx	n SD . 500	HC Card '000 test	reports)		
•	Power requirements:	- 195 - 851	260 30 V	VAC, 50/ AC, 50/60	60 Hz, max. 1,1 ) Hz, max. 1,100	00 W ) W	
•	Air pressure supply:	5 – 8 ba can be o	ar (fo opera	r cleaning ated witho	function only, th out compressed a	ne instrument air)	
•	Projection of clamping arm:	50 cm (2	20")				
•	Sample thickness:	0 - 10 m	nm (C	) – 0.4")			
•	Operating temperature range:	0°C 4	45°C				
•	Storage temperature range:	-20°C	. 60'	C			
•	Dimensions (w x d x h):	40 x 100	0 x 9	8 cm			
•	Table height:	80 cm					
•	Net/gross weight:	55 / 76	kg				

# 13. EU DECLARATION OF CONFORMITY FOR MACHINERY



Testing Instruments for Quality Control

#### **EU – Declaration of Conformity**

This declaration of conformity is issued under the sole responsibility of TEXTEST AG.

Manufacturer:	TEXTEST AG
Address:	Sonnenbergstrasse 72, CH-8603 Schwerzenbach / Switzerland
Instrument designation:	FX 3300 Air Permeability Tester IV
Trade designation:	LABAIR
Туре:	FX 3300-IV

The object of the declaration above is in conformity with the relevant Union harmonization legislation:

- 2006/42/EC Machinery Directive
- 2014/35/EU Low Voltage Directive
- 2011/65/EU RoHS-Directive

Applied standard:

• EN 61010-1:2010

Schwerzenbach, May 9, 2018

TEXTEST AG

Nils Fretz Head of technical department

## **TEXTEST AG**

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