



Bluenco srl
Engineering and Construction

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FILTERABILITY TEST UNIT

Model BLU-IF 14LS250

User Manual

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1 INTRODUCTION

The purpose of this manual is to provide to the user the different operating modes of the instrument for Vmax tests. We will give instructions on how to install and operate.

It is advisable to follow carefully the directions for use of the equipment. Taking actions not indicated in this manual, it might affect the smooth operation of the instrument as the balance connected to it.



The instrument has one-year warranty and **NOT TO BE OPENED BY THE USER** for any reason.

Any attempt to repair or modify the unit exposes the user to the danger of electric shock and will void any warranty condition.

Any problem with the system must be notified to the manufacturer or retailer where it was purchased.

In any case, DISCONNECT POWER SUPPLY before taking any action.

The instrument is isolated from the area to dangerous voltage and user accessible parts.

1. Did not pour liquids on and / or on the control console.
2. Do not use solvents to clean the indicator and / or the control panel.
3. Do not expose the instrument to direct sunlight or heat sources

Place the instrument and the weighing platform on a vibration free table.

All connections must be made respecting the rules applicable in the area and in the installation.

Anything not specifically described in this manual is to be considered as improper use of the equipment.

Do not install in an environment with danger of explosion.



The product at the end of its useful life must be taken to recycling centers, or to the reseller at purchase of an equivalent new product.

2 TECHNICAL SPECIFICATION

Power supply

24 V

Operating Temperature

From -1 to +40 ° C

Rated capacity

15 kg

Pressure¹

Max inlet 2.5 bar

2.1 GENERAL FUNCTIONS

- Balance with non-automatic weighing
- Allows you to test for the assessment of Vmax clogging of a filter system in the event of gradual clogging of the pores.

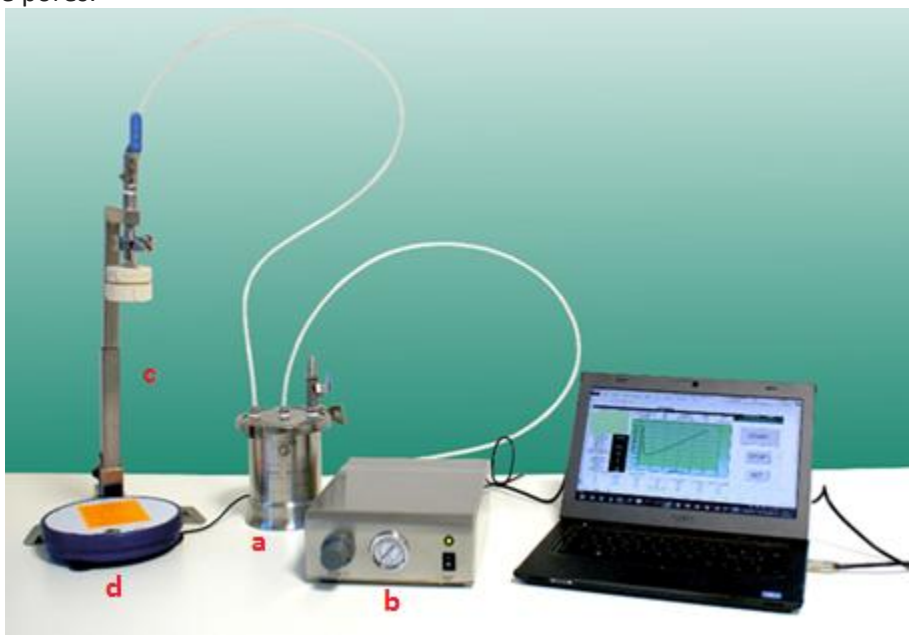


Photo 1- Filterability Test equipment

INSTRUMENT COMPONENTS (See Photo 1)

- a) Pressure tank
- b) Control system
- c) steel stand equipped with screw connection in which to secure the filter holder for 47 mm membranes.

¹ Install a pressure regulator to reduce the pressure to 2.5 bar before connecting air supply to the control system.

- d) Balance 15 kg
- e) Suitcase for transport of all the components forming part of the instrument.

The personal computer in Photo 1 is not included in the supply.

3 CONNECTIONS AND ASSEMBLY OF THE INSTRUMENT

3.1 CONNECTING THE SCALE

Screw the female scale connector on the male connector (Scale) on the back panel of the control system (Photo 2).



Photo 2- USB, balance and power supply connections.

3.2 ELECTRICAL CONNECTION

Connect the power supply to the connector (Power) shown in Photo 2. Then connect the plug to the mains 220V 50 Hz.

3.3 COMPRESSED AIR CONNECTION

Connect the compressed air supply (A / C) to the **INLET** quick connection (Photo 2) using a Rilsan² tube of 6 mm.

3.4 SETTING THE PRESSURE TEST

The front panel allows you to adjust the pressure of the gas used during the testing, using the knob "**Pressure Test**" in Photo 3. A pressure gauge with full scale 2.5 bar allows you to read the pressure.

² The Rilsan tube must have a minimum resistance to pressure of 3 bar. Normally they are rate at 6 bar.

3.5 TURNING THE INSTRUMENT

By pressing the "**Power**" button(Photo 3), you can turn on/ off the instrument.

The LED just above the "**Power**" button provides information about the operating status of the instrument as shown in Table 1.

LED Status	What is doing
Flashing red	The control system isn't connect to the USB port of the personal computer (PC) that is used as a data acquisition.
Solid red	Reset performed but the system is not connect to PC
Solid green	System connected to the PC and the reset is done
Blinking green	System connected to the PC but balance reset is pending
Yellow/Orange	The system is in data acquisition mode.

Table 1- Operating Status tool



Photo 3- Control system front panel

3.6 FILTER INSTALLATION

- I. I. Unscrew the plastic holder (Photo 4)
- II. Place a 47 mm disc filter on the lower part of the filter holder.

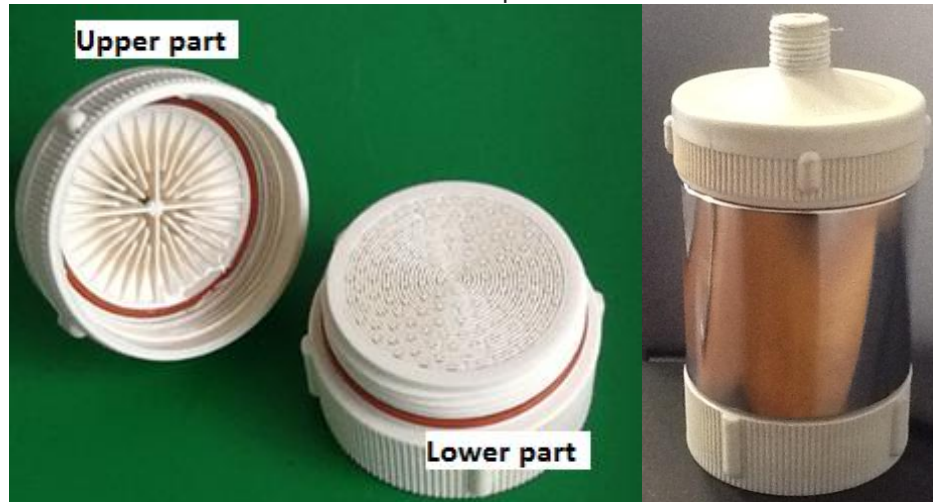
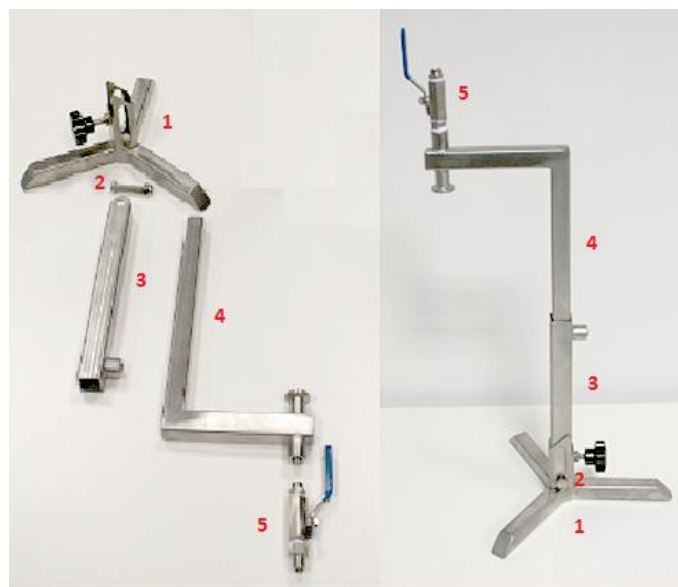


Photo 4

- III. Screw the two parts of the filter holder together, making sure that the O-rings are in the correct position.
- IV. Some application (viscous fluid) require the use a SS ring between the upper and lower part to improve filtration.

3.7 ASSEMBLY OF FILTER HOLDER SUPPORT

The trellis is composed of five parts. They are assembled as shown in Photo 5.





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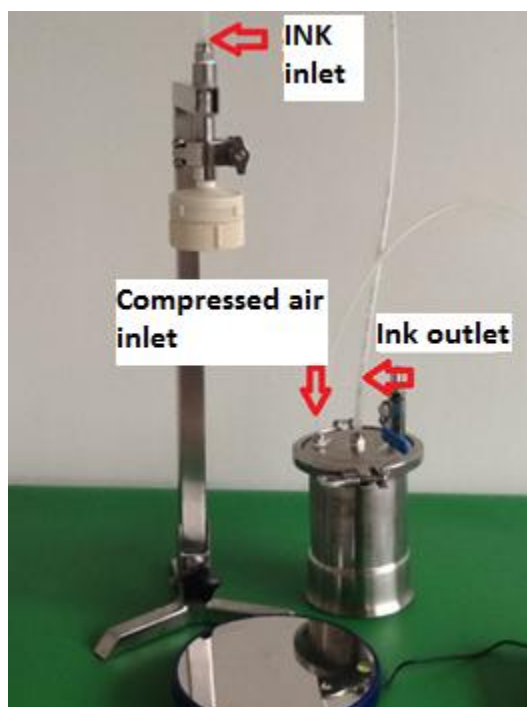
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Photo 5- Trellis filter holder: Components and assembled

3.8 TEST EXECUTION

Unpack the pressure tank and its components, removing the protective bags and assemble as shown in Photo 6.

3.8.1 CONNECTION OF SYSTEM COMPONENTS BEFORE TO START A TEST



- Connect the pressure tank OUTLET to the INK INLET using a Rilsan tube of 6 mm diameter (see photo 6).
- Install the filter holder on the trellis after inserting an appropriate 47 mm filter.
- Place the scale below the trellis. Unscrew the feet of the balance and adjust its flat position.
- Connect the quick connector output(Photo 3) from the instrument to the quick INLET for the compressed air

Photo 6-

3.9 CONNECTION OF THE CONTROL SYSTEM TO A PERSONAL COMPUTER (PC)³.

Connect the PC and the control system using the appropriate USB cable between as shown in Photo 2 (Serial connection).

³ To operate the instrument must be connected to a PC. The PC must have installed the operating system Windows 8. You also need the Excel program in one of the versions from 2003 to 2013.

4 PROGRAM FOR 'DATA ACQUISITION

4.1 INTRODUCTION

The tool uses the program Excel BLUENC_V114.xls4 for the acquisition and processing of data. Before starting a test or series of tests, save a copy of the master file to a new folder in which you plan to collect the results of tests that go into making.

4.2 MASK DATA ENTRY

When you launch the Excel file BLUENCO_V114.xls appears the following mask data entry.



Field	Value	Field	Value
Test name*	NPV0	Date (dd/mm/yyyy)*	22/01/2015
Pressure drop (bar)	2,5	Customer	
Temperature (°C)	12	Operator	
Viscosity (Pa*s)	1	Sample name	
Density (Kg/l)*	1,36	Product lot	
Filtration area (cm^2)*	13,8	Pre-Filter type	
Acquire time (s)*	1	Filter cat. n#	
Test time (s)*	30	Pore size (um)	11
Max weight (g)*	500		
Vmax limit of acceptability*	200		
PC COM door*	2		

Buttons: Change Vmax, SAVE DATA, Italiano

Example 1- Mask data entry

Table 2 shows the meanings of single data in the mask.

Data with an asterisk sign are mandatory.

Acting on the “**Change Vmax**” button you can select one data of the last ten tests and then you can clone it , changing data you need to up-date.

There are rules to follow when entering data. If data is not entered correctly, the program pot-up an error message. The program accepts only alphanumeric characters.

⁴ Each unit has a copy of the acquisition program. The user undertakes to use it only with the equipment purchased. Any other use must be authorized by BLUENCO.



Description of the input data:

Parameter	Description
Date	Day test is done
Customer	Customer name
Operator name	Name of the operator has done the test
Product name	Ink name
Product lot nr	Ink lot number
Test nr	Test number
Test Pressure (mbar)	Test pressure
Temperature(°C)	Temperature during test
Viscosity(sec)	Ink viscosity
Density (kg/l)	Ink density
Filtration surface(cm²)	Net filtration surface during test. For a 47 mm filter is 13,8 cm ²
Time between two sampling (sec)	Time between two measure of weight .t.
Total Sampling Time (sec)	Expected total sampling time for a test
Max weight (g)	Max weight to filter. Test will stop automatically when the weight reach this value.
Pre-filtration	Add comments if you had used two filtration steps
Filter cat. number	Name and cat. Code for the filter used for ink filtration in production
Filtration rate	Filtration rate of the filter used for quality control
Min Vmax acceptable limit	Min Vmax acceptable for the ink under test
COM port connected to PC	COM port Nr connected to PC ⁵
Save Data	Press this button to save the data and move on to the next activity
Italiano	Press this button to change language from English to Italian
Change Vmax	Press this button to clone data from a previous test

At the end of a test you can print the results on paper or save them as PDF files.

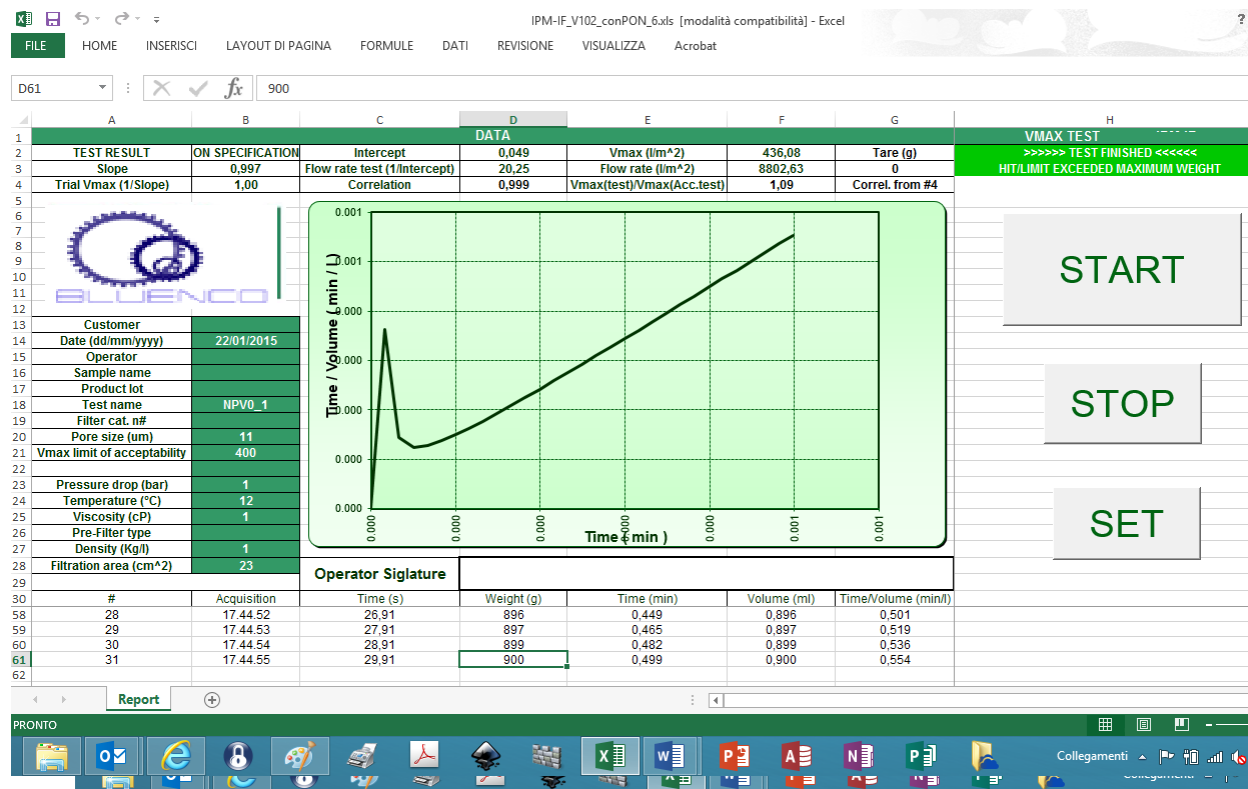
To do this, access the settings of the personal computer "**Control panel/View devices and printers**".

Select

- Acrobat PDF printer as favorite
- Or the printer to which the PC is connected.

⁵ At first installation or if you change the USB port to which the system is connected to the PC you must identify the USB port to which you are connected. Follow the path of Windows 8 that lets you access the device manager which shows the ports that the PC has opened. Locate the one to which the system is connected and insert it in the mask input data.

4.3 REPORT MASK



TEST RESULT		ON SPECIFICATION	DATA				VMAX TEST
Intercept	0,049		Vmax (l/m ²)	436,08	Tare (g)	0	>>>>> TEST FINISHED <<<<<
Slope	0,997		Flow rate test (l/Intercept)	20,25	Flow rate (l/m ²)	8802,53	HIT/LIMIT EXCEEDED/MAXIMUM WEIGHT
Trial Vmax (1/Slope)	1,00		Correlation	0,999	Vmax(test)/Vmax(Acc.test)	1,09	
			Correl. from #4				

#	Acquisition	Time (s)	Weight (g)	Time (min)	Volume (ml)	Time/Volume (min/l)
28	17.44.52	26.91	896	0.449	0.896	0.501
29	17.44.53	27.91	897	0.465	0.897	0.519
30	17.44.54	28.91	899	0.482	0.899	0.536
31	17.44.55	29.91	900	0.499	0.900	0.554

This mask allows you to follow in real time the test:

On the left under the logo Bluenco are data that describe the test.

In the upper part it shows the results of a test.

At the center is the graph of a test . It is built in real time.

Below the graph mask shows data acquired / processed during the test.

On the left there are three buttons.

START: To start a test

STOP : It is used only in case you want to stop the test before reaching the maximum weight or test time.

SET : To insert the data regarding a new test.

The test is considered valid if the index of linear correlation is ≥ 0.98 (Cell B2 of the sheet reports greater than 0.98) and if the value of Vmax measured is greater than the minimum (cell F4 of the sheet reports greater than one).

5 STEPS TO PERFORM A TEST

Warning: Turn on the instrument only after connecting the weighing platform.

Read sections 2 and 3 before proceeding with the instructions in this section.

- 1) Install the instrument following the instructions of paragraph 3.
 - 2) Remove any weight from the scale.
 - 3) Turn on the instrument as described in Section 3.5.
 - 4) Put a container on the scale in which to collect the product filtered.
 - 5) Install a new filter in 47mm filter holder as shown in section 3.6.
 - 6) Install the filter holder on the trellis as described in Section 3.9.
 - 7) Connect the pressure tank to the system
 - 8) Fill the pressure tank with the ink to be tested.
 - 9) Open and Start the Excel file BLUENCO_V114.xls.
 - 10) When the file is open it shows the data entry mask (See section 4 for an explanation of the data to be entered). If the mask is not shown you, need to go off macro security.
 - 11) Verify / enter the required data and then press the "Save Data".
 - 12) Program moves to the sheet Report (See section 4.3)
 - 13) Press the "START" button to begin test.
 - 14) If you want to stop the test , press the "STOP" button.
- When the test is completed, you can save the data as excel file and/or pdf file, or print on paper (see 4.2).



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NOTE: