

# Labacqua Trace, Labacqua HPLC, Labacqua Bio **Water purification system**



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## 1. About this edition of user instructions



1.1. The current edition of the user instructions applies to the following models:

Model	Version
Labacqua Trace, water purification system	V.5A01
Labacqua HPLC, water purification system	V.5A02
Labacqua Bio, water purification system	V.5A03






1.2. Edition 5.04 – April of 2024

## 2. Safety precautions

2.1. Symbols used in the manual

- **Caution!** Make sure you have fully read and understood the present instructions before using the equipment. Please pay special attention to sections marked by this symbol.
- **Caution!** Do not service the unit with an operating UV compartment. Otherwise, operator can receive dangerous levels of UV emission.

2.2. Icons used on the unit and packaging

	CE marking, manufacturer affirms conformity with European health, safety, and environmental protection standards, see <b>12.1</b>		
	WEEE directive marking, see <b>12.1</b>		Do not proceed further without reading the user and service instructions first
	This sign marks the area of electrical grounding		This sign indicates high voltage areas

### 2.3. General safety

- The protection provided can be ineffective if the operation of the appliance does not comply with the manufacturer's requirements.
- Store and transport the unit as described in section **Storage and transportation**.
- Save the unit from shocks and falling.
- Before using any cleaning or decontamination methods except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment.
- Use only original parts and accessories, provided by manufacturer for this product.
- Do not make modifications in design of the unit.
- Do not block the ventilation openings
- Do not operate the unit with removed covers.
- Do not drink deionized water.

### 2.4. Water leakage prevention

- Ensure that no water tubes are bent.
- Ensure that all connections are watertight.
- Ensure that the drainpipe exit is lower than the drain fitting in the unit.
- Install a particle filter on the water access pipe. Warranty does not cover malfunctions of the unit if the filter is not installed.
- Close off the water access pipe when leaving the unit for extended period.

### 2.5. Electrical safety

- Use a power line regulator if the local mains network is susceptible to fluctuations exceeding 10% of the nominal values.
- Connect only to the mains with voltage corresponding to that on the serial number label.
- When replacing fuses, re-check its placements.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that the power plug is easily accessible during use.
- Disconnect the unit from the mains before moving.
- If liquid penetrates into the control module, disconnect the unit from the mains and have it checked by a repair and maintenance technician.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in section **Specifications**.

### 2.6. During operation

- Do not operate the unit in environments with aggressive or explosive chemical mixtures. Please contact manufacturer for possible operation of the unit in specific atmospheres.
- Do not operate the unit if it is faulty or has been installed incorrectly.
- Do not use outside laboratory rooms.

### 2.7. Biological safety

- The user is responsible to carry out appropriate decontamination if hazardous material spills on or penetrates into the equipment.

## 3. General information

### 3.1. Unit overview.

Biosan Labaqua is Ultrapure water purification system which requires external water tank that use tap water as feed water (tap water system). There are three models available: Labaqua Trace, Labaqua HPLC and Labaqua Bio.

Water purification system Biosan Labaqua produces pure water that complies with ISO 3696 Grade II and Grade I water requirements.

Pure (ISO 3696 Grade II) water applications include, but are not limited to:

- Feed for laboratory equipment (washing machines, clinical analysers, humidifiers, autoclaves, hydrogen gas generators);
- Manufacturing of chemical and biochemical reagents;
- Buffer preparation;
- Microbiological media preparation;
- In some cases - sensitive analytical techniques (e. g. atomic absorption, ICP-OES);
- Wet chemistry;
- Spectrophotometry.

Ultrapure (ISO 3696 Grade I) water applications include but are not limited to:

- High sensitivity analytical techniques (ICP-MS);
- High performance liquid chromatography;
- TOC analysis
- Molecular biology;
- Cell culture.

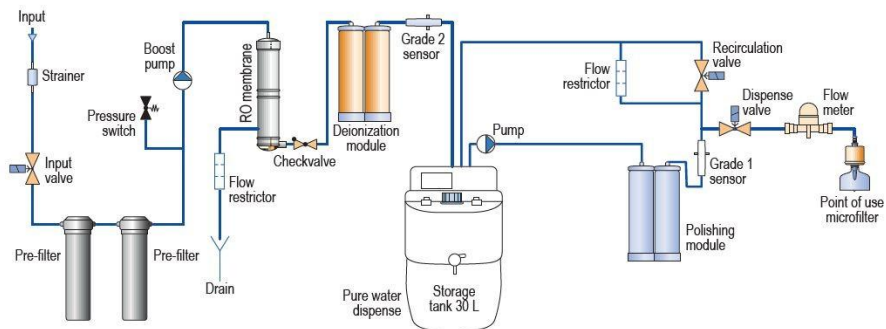
**Table 1. Labaqua model comparison**

Model	Labaqua Trace	Labaqua HPLC	Labaqua Bio
Grade I water resistivity	18.2 MΩ x cm		
Grade I water conductivity	0.055 μS/cm		
Grade II water conductivity	0.1 μS/cm		
TOC	< 10 ppb	< 5 ppb	
RNase	–	–	< 0.01 ng/mL
DNase	–	–	< 4 pg/μL
Bacteria	< 0.01 CFU/mL		
Endotoxins	0.15 EU/mL		0.001 EU/mL

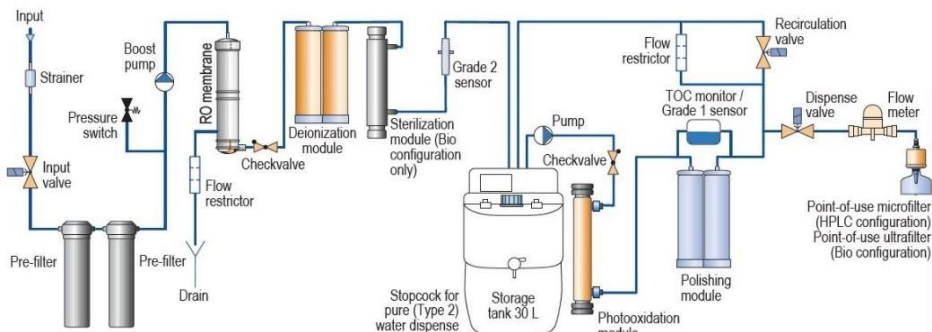


**Figure 1. Unit overview**

**1. Power switch (on the back panel) 2. Water access connection (on the back panel). 3. Control panel and display. 4. Filter and clean water dispenser. 5. Pre-filter set, deionization and polishing modules (behind side door)**



**Figure 2. Labaqua Trace scheme**



**Figure 3. Labaqua HPLC / Bio scheme**

### 3.2. Operation principle.

3.2.1. The hydraulic diagram of the Biosan Labaqua water purification system can be seen in figures 2 and 3.

3.2.2. The input valve controls intake of feed water from the access. The first cleaning stage is the pre-filter set that uses activated carbon to remove particles, free chlorine, organics and colloids. The pressure switch controls incoming water pressure.

3.2.3. The boost pump maintains pressure for the efficient operation of the reverse osmosis membrane, deionization module and UV sterilization module (model Bio only). The feed flow splits on the membrane into the permeate, which diffuses through the membrane, and the concentrate, which passes over the membrane, carrying away contaminants through the drain. The permeate proceeds to the deionization module where the remaining dissolved contaminants are removed.

3.2.4. Before entering the tank, model Bio sterilizes the water with an UV lamp. Water quality is controlled by Grade II water conductivity sensor. LCD display shows these values.

3.2.5. Purified water is stored in the tank. Water in the tank meets the requirements of ISO 3696 Grade II.

3.2.6. To obtain Grade I water, the Grade II water in the storage tank must pass through a recirculation loop. For model Trace this loop consists of a recirculation pump, a polishing module, a Grade I water sensor and a dispense port with microfilter. Models HPLC and Bio additionally include a photooxidation module and a TOC monitor. Model Bio has an ultrafilter instead of a microfilter.

## 4. Pre-installation requirements

4.1. Make sure the following pre-installation requirements are met before unpacking and installing the unit.

**Table 2a. Electrical requirements.**

Operating current	200–240 V~
Operating frequency	50/60 Hz

**Table 2b. Input water requirements.**

Type of feedwater	Potable
Minimum pressure	≥ 0.5 bar
Maximum pressure	≤ 5 bar
Conductivity	< 1300 µS/cm
Temperature	5 ... 35°C
pH	4 ... 10
Fouling Index	< 10
Iron	< 0.1 ppm as CaCO <sub>3</sub>
Aluminium	< 0.05 ppm as CaCO <sub>3</sub>
Manganese	< 0.05 ppm as CaCO <sub>3</sub>
Free chlorine	< 1 ppm
Langelier saturation index	< +0.2
TOC	< 2000 ppb
Water access connections	½" male NPTF

### 4.2. Electrical requirements

- Use a power line regulator if the local mains network is susceptible to fluctuations exceeding 10% of the nominal values.
- Connect only to the mains with voltage corresponding to that on the serial number label.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that the power plug is easily accessible during use.

### 4.3. Water access connection.

4.3.1. Feedwater hardness affects water-cleaning quality. Using hard feedwater may result in premature clogging of reverse osmosis membranes and reduced Grade II or Grade I water output.



**Caution!** Therefore, we strongly recommend installing a water softener or a polyphosphate particle filter if water hardness is above 160 ppm.

4.3.2. Filter and soften feedwater with polyphosphate-carbon 1 µm particle filter. If the filter is not installed, pre-filter in the unit will clog and block the water flow. There must be at least one filter on the feedwater access pipe. Filter is available in the local plumber shops or by ordering at Biosan.





**Figure 4. Filter on the water access pipe.**



**Caution!** Please note that if the pre-filter clogs prematurely, such malfunction will be covered by warranty only if the service department receives photographic proof of the particle filter installed in the feedwater access pipe.

4.3.3. Feedwater connection port has to be ½" NPTF male thread. The system is equipped with feedwater tube (¼" outer diameter) and a ½" NPTF female adapter for water supply connection. The feedwater tube should be connected to the ¼" John Guest adapter in the unit. Feedwater connection pipe must have a valve to allow closing off water supply.

4.3.4. Feedwater supply connector and drain should be within 3 meters from the unit location.

4.4. Water leakage safety:

- Ensure that no water tubes are bent.
- Ensure that all connections are watertight.
- Feedwater access and drain connections must be no farther than 3 m from the unit.
- Water access connector is ½" male NPTF.



**Caution!** Ensure that the storage tank is connected to the drain with a tube from the OVERFLOW fitting. Ensure that the drain is lower than the OVERFLOW fitting. This prevents water leakage in case of water level sensor malfunction.

4.5. Requirements for the installation site. Ensure that the unit is placed on a solid, level surface not less than 320x560 mm, which is able to support its weight and the weight of water inside the unit. The storage tank Pro requires at least 300x300 mm free space. The tank during operation weighs up to 40 kg. The tank can be placed below the unit. Ensure that all cables, tubes and the power switch on the rear panel of the unit are easily reachable.

4.6. Requirements for the environment. The water purification unit is intended for indoor use only, at ambient temperature from +15°C to +30°C (59 to 86 °F) in a non-condensing atmosphere and relative humidity between 20% and 80%.

## 5. Getting started

**5.1. Unpacking.** Remove packing materials carefully and retain them for future shipment or storage of the unit. Examine the unit carefully for any damage incurred during transit. The warranty does not cover in-transit damage. Warranty covers only the units transported in the original package.



**Caution!** Due to the high weight of the unit, its unpacking and installing must be carried out by two persons.

**5.2. Complete set.** Package contents:

**5.2.1. Standard set:**

- Water purification system, Labaqua **Trace/HPLC/Bio** ..... 1 pce.
- Storage tank Pro ..... 1 pce.
- Pre-filter cartridges ..... 2 pcs.
- Polishing module ..... 1 pce.
- Deionization module ..... 1 pce.
- 0.22 µm filter dispenser (models **Trace & HPLC**) ..... 1 pce.
- Ultrafilter dispenser (model **Bio**) ..... 1 pce.
- Adapter from ½" NPTF to ¼" John Guest ..... 1 pce.
- Straight angle fittings for polishing & deionization modules ..... 4 pcs.
- Tubes, ¼" OD ..... 5 pcs.
- Tube, ⅜" OD & straight angle fitting ..... 1 pcs.
- Bypass tube for disinfection ..... 1 pce.
- Storage tank water level cable ..... 1 pce.
- Power cable ..... 1 pce.
- Tool for tube detaching ..... 1 pce.
- User instructions ..... 1 copy

**5.2.2. Optional accessories:**

- 1 µm particle filter, carbon ..... on demand
- 1 µm particle filter, polyphosphate-carbon ..... on demand

**5.3. Setup.** Ensure that the requirements listed in section **4. Pre-installation requirements** are met.

**5.3.1. John Guest fittings** (figure 5). Unit is equipped with push-in John Guest fittings (henceforth JG), with clamps that hold a tube with steel teeth without deforming the tube or blocking the flow. O-type sealing ring ensures hermetic seal. To facilitate tube detachment, a special tool for clamp pressing is included in the standard set.



**Figure 5. John Guest type fitting and the tool for tube detaching.**

5.3.2. Tube connection. Push the tube into the fitting to the stop (fig. 6/a) and tug back to ensure the clamping (fig. 6/b).

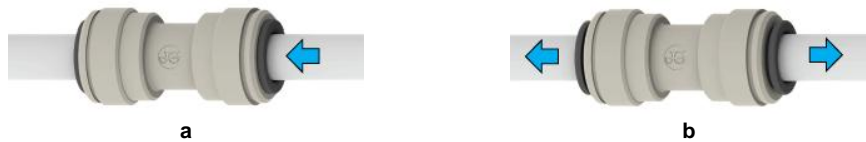


Figure 6. Connecting tubes

5.3.3. Disconnecting tubes. Ensure that the system is not under pressure. Press the clamp sleeve on the fitting (fig. 7/1). This loosens the clamp, and the tube can be detached (fig. 7/2).


 **Note.** Use the tool for tube detaching (figure 5, right) included in the standard set, for easier operation.



Figure 7. Detaching tubes

5.4. Side door and the rear panel. Side door provides access to installation sockets for cleaning filters and modules (figure 8). Rear panel has inlet and outlet fittings and sockets (figure 9).



Empty unit



Work-ready unit

Figure 8. Filters and cleaning modules.

1. Deionization module socket. 2. Polishing module socket. 3. Pre-filter sockets.



Top



Bottom

Figure 9. Rear panel.

1. Unit info and serial number. 2. Connector for the Flow Point 3 water dispenser. 3. Service socket. 4. Tank water level sensor socket. 5. Mains' cable socket and fuse socket. 6. Power switch. 7. Connector for the Flow Point 3 water dispenser. 8. Feedwater inlet fitting. 9. Drain fitting.

10. Connector for the Flow Point 3 water dispenser. 11. Recirculating water inlet fitting. 12. Recirculating water outlet fitting.

5.5. **Pro tank.** Storage tank Pro, 30 L in volume, is equipped with water level sensor and dispenser tap and is designed for storage and recirculation of clean water.



Front view



Rear view



Top view



Bottom fittings

Figure 10. 30L Pro tank.

1. Tank level sensor socket. 2. Overflow. 3. Lid. 4. Air filter. 5. Dispenser tap. 6. Recirculating water inlet fitting. 7. Recirculating water outlet fitting.

**5.6. Order of filter and module installation.** Open the side door (fig. 1/5) and install cleaning modules in the following order: the deionization module and the polishing module first (in sockets on fig. 8/1 and 8/2), then the pre-filters in sockets on figure 8/3.

**5.7. Deionization and polishing module installation.** Processes are identical for both modules.

**5.7.1. Distinguish the modules (figure 11):** deionization module is marked with a blue sticker, polishing module – with a silver sticker on the front sides.



**Figure 11. Polishing and deionization modules.**

**5.7.2. Remove both black corks from the module top.**

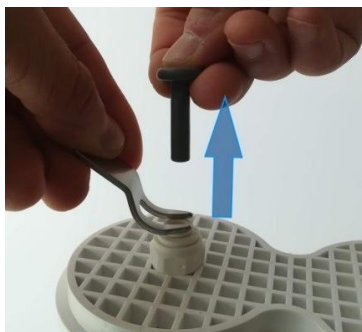


**Note.** Use the tool for tube detaching (figure 5, right) included in the standard set, for easier operation.

Press down the small rubber ring on the fitting with fingers (fig. 12/a) or with the tool (fig. 12/b) and remove the cork.



**a**



**b**

**Figure 12. Removing the cork.**

5.7.3. Prepare two straight angle module connecting fittings (fig. 13/a) and insert them in the module fittings to the stop, so that the free ends are rotated towards the side of the module with guide rail (fig. 13/b). Check the connecting fittings for a tight fit.



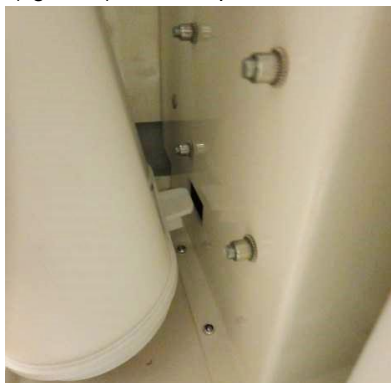
a



b

**Figure 13. Installing the connectors.**

5.7.4. Insert the guide rail in the slot (fig. 14/a). Push both connectors into the fittings on the unit (fig. 14/b) to the stop. Check the connecting fittings for a tight fit.



a

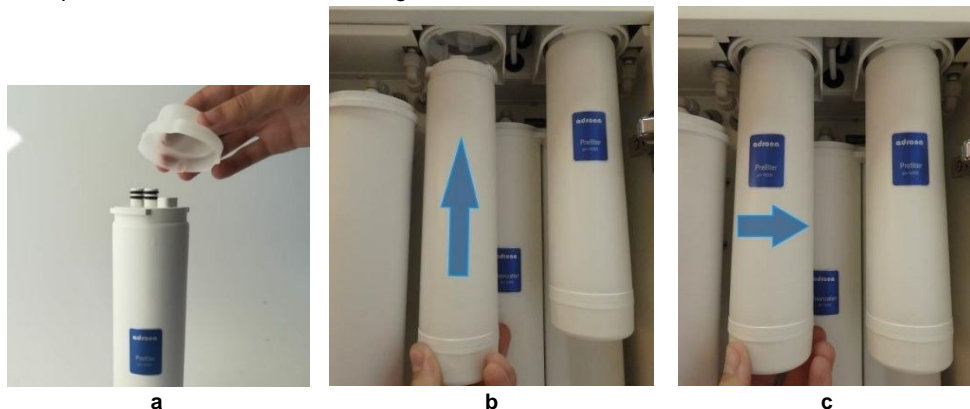


b

**Figure 14. Fitting the module inside the unit.**

5.7.5. Repeat the operation with the second module.

5.8. Pre-filter cartridge installation. Turn and remove the protective cap from both of the cartridges (fig. 15/a). Insert a cartridge in the socket (fig. 1/3 and 15/b) and lock it in place by turning cartridge a quarter turn to the right ( fig. 15/c) Check the cartridge for a tight fit. Repeat the operation with the second cartridge.



**Figure 15. Pre-filter installation.**

5.8.1. Installed filters and modules look as on figure 8, on the right.

#### 5.9. Tube and sensor installation.

5.9.1. Connect the  $\frac{1}{2}$ " NPTF to  $\frac{1}{4}$ " JG adapter (fig. 16) to one of the  $\frac{1}{4}$ " OD tube. Connect the NPTF/JG adapter to feedwater access pipe (section **Pre-installation requirements**), and the open end of the tube to the TAP WATER fitting on the rear panel (fig. 9/7).



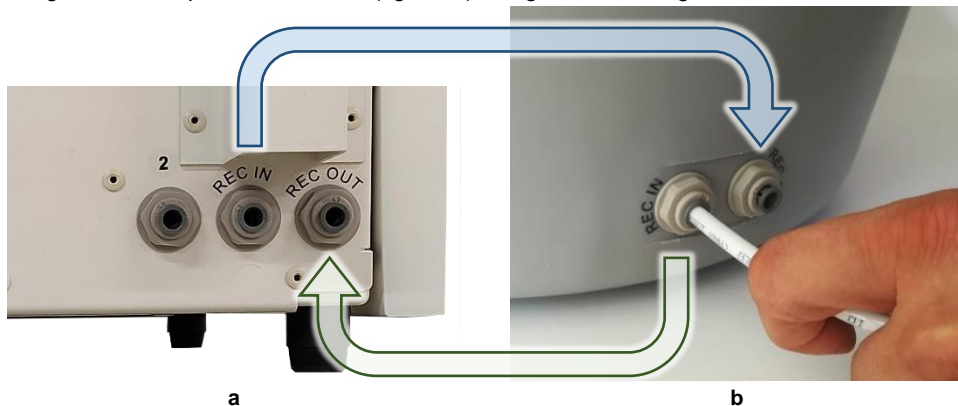
**Figure 16. NPTF  $\frac{1}{2}$ " to JG  $\frac{1}{4}$ " adapter for feedwater.**

5.9.2. Connect another  $\frac{1}{4}$ " OD tube to the DRAIN fitting on the rear panel (fig. 9/8). Connect the open end of the tube to the drain that is prepared according to section 4. **Pre-installation requirements.**

**5.10. Connecting the storage tank to the system.** Position the tank on an even horizontal surface (see **4.6**). Locate two pairs of REC IN and REC OUT fittings: one pair on the unit (fig. 9/9 and 9/10) and one pair on the tank (fig. 10/6 and 10/7)

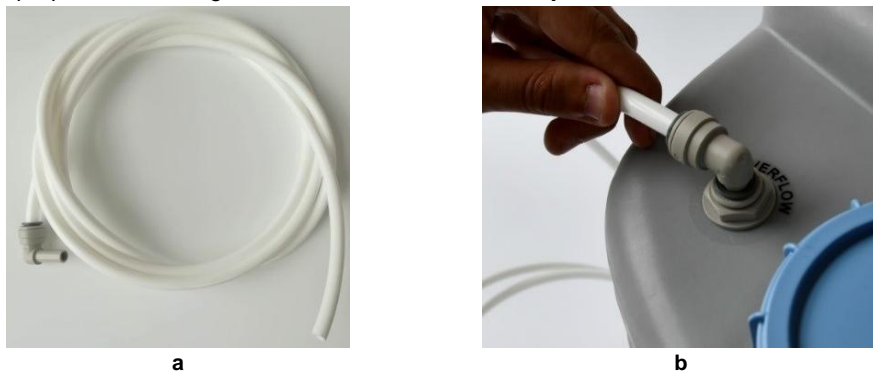
5.10.1. Connect the REC IN fitting on the rear panel of the unit (fig. 17/a) and the REC OUT fitting on the rear panel of the tank (fig. 17/b) using a  $\frac{1}{4}$ " OD tube.

5.10.2. Connect the REC OUT fitting on the rear panel of the unit (fig. 17/a) and the REC IN fitting on the rear panel of the tank (fig. 17/b) using the remaining  $\frac{1}{4}$ " OD tube.



**Figure 17. Tank and system connection**

5.10.3. Connect the  $\frac{3}{8}$ " OD tube with straight angle fitting (fig. 18/a) to the OVERFLOW fitting on the top side of the tank (fig. 10/2 & 18/b). Connect the open end of the tube to the drain that is prepared according to section **Pre-installation requirements**.



**Figure 18. Overflow**



5.10.4. Connect the water level sensor cable (fig 19/a) to the socket on the tank (fig. 19/b & 10/1) and to the socket on the unit (fig. 19/c & 9/4).

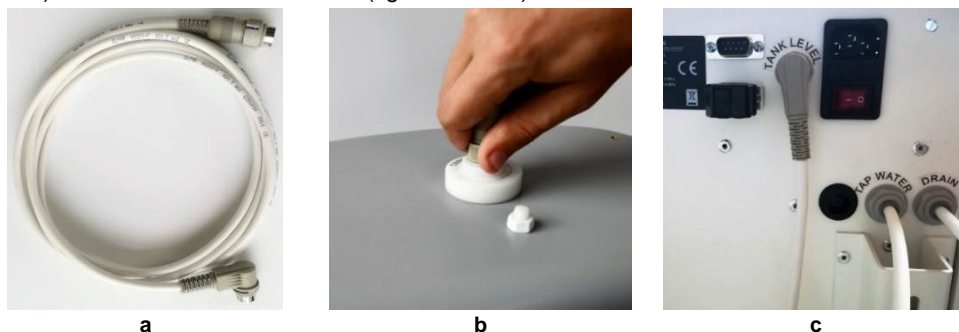


Figure 19. Water level data cable

#### 5.11. Installation of dispenser filter.

5.11.1. For **Trace** and **HPLC** models. Unpack the 0.22  $\mu$ m dispenser filter (fig. 20/a) and the black sealing ring (fig. 20/b). Screw the filter in the slot below the display so that the ring stays on top of the thread of the filter (fig. 20/c) in the slot as shown on figure 21/d. White bell cap must cover the dispenser at all times when the water is not being dispensed.



Figure 20. 0.22  $\mu$ m filter dispenser installation.

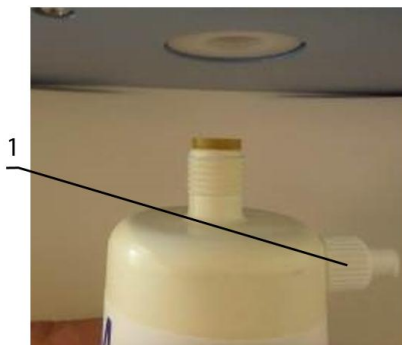
5.11.2. For **Bio** model. Unpack the dispenser ultrafilter (fig. 21/a) and the yellow sealing ring (fig. 21/b). Screw the filter in the slot below the display so that the ring stays on top of the thread of the filter (fig. 21/c) in the slot as shown on figure 21/d. Blue bell cap must cover the dispenser at all times when the water is not being dispensed.



**a**



**b**



**c**



**d**

**Figure 21. Ultrafilter dispenser installation.**

5.12. Insert the power cable into the socket on the rear panel of the unit (fig. 9/5) and position it for an unobstructed access to cable and the plug.

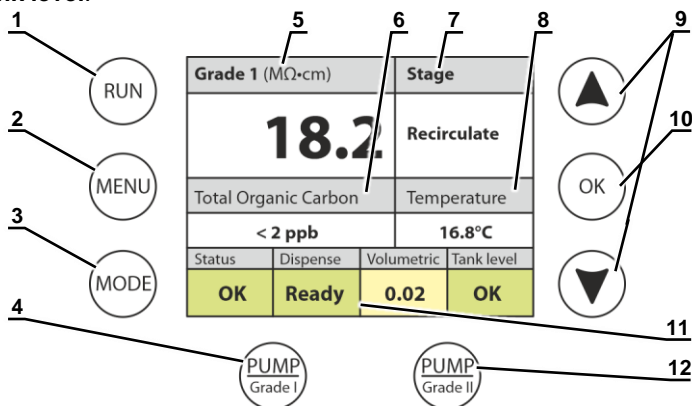
## 6. Operation

6.1. Open feedwater access (see 4.4).

6.2. Check the power cable for damages and connect the plug to a grounded mains socket. Turn the power switch (fig. 9/6) to **I** (on).

6.3. After several second of loading, the display shows (figure 22):

- **Water quality** and grade (fig. 22/5);
- **Stage** of the operation (fig. 22/7);
- **Total Organic Carbon**, or TOC, content (fig. 22/6);
- **Temperature** of the water (fig. 22/8);
- **Indicator bar** (fig. 22/11)
  - **Status** of the unit;
  - **Dispense** status;
  - **Volumetric** dispense setting;
  - **Tank level**.



**Figure 22. Control panel and display**

6.4. **Lowering and controlling TOC** (only for **HPLC** and **Bio** models). To lower the total organic carbon (TOC) content, previously purified water passes through organics photooxidation module and a polishing module to remove resulting products. To maintain a low TOC level, we recommend constant water recirculation in the storage tank. TOC level measurements are performed during recirculation stage, and the values are displayed after the unit at least partially fills the tank and performs at least one recirculation cycle, and the unit is at Filling, Grade I water dispensing or Recirculation stages (fig. 22/7).

6.5. **Checking water quality**. Press the **Mode** key (fig. 22/3) to check the water quality. Unit changes the stage (fig. 22/7), and quality values appear (fig. 22/5).

6.5.1. Diagnostic screen (figure 23). Press the **Mode** key twice in quick succession. Display will show the diagnostic screen that provide information and status for all sensors and components, as well as the tank water level.

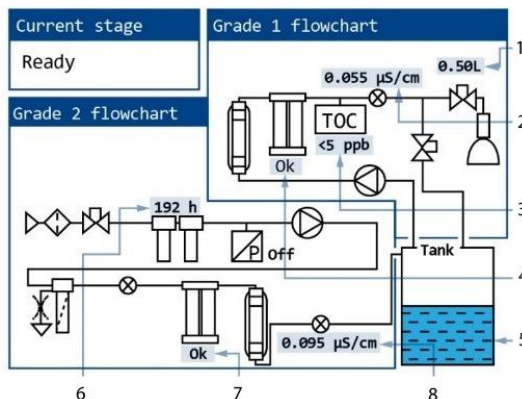


Figure 23. Diagnostics mode.

1. Dispensing volume. 2. Grade I water quality. 3. TOC monitor (HPLC & Bio). 4. Polishing module status. 5. Water level in storage tank. 6. Pre-filter countdown. 7. Grade II water quality. 8. Deionization module status.

6.6. **Unit rinsing.** A rinsing is necessary before starting the operation. Press the **Run** key (fig. 22/1) to start the rinsing cycle. Leave the unit rinsing for 2 hours.



**Caution!** Check the fittings inside the unit for leakage.

Check the water flow in the REC OUT tube and drain tube. The water flow in the drain tube must be 2–5 times stronger than in the REC OUT tube. If the REC OUT tube flow is stronger, then the RO membrane is damaged. Stop the unit by pressing the **Run** key and contact the service.

6.7. **Filling the tank.** Press and hold the **RUN** key for 2 seconds. If the tank is connected and not full and the feedwater supplying pressure is adequate, display shows the Filling tank stage change. Unit fills the storage tank with Grade II water. As soon as the tank is full, unit shuts off the water supply and displays the Tank Full message. This takes approximately 1 hour with an empty tank.

6.8. **Recirculation** (models **HPLC** and **Bio** only). Allow the unit to fill the storage tank, disconnect water supply and setup the recirculation schedule as shown below. Leave the unit recirculating for 8 hours. Recirculation removes all remaining organic contamination and lowers the TOC levels below 5 ppb.




**Caution!** Microfilter / ultrafilter must be rinsed before use! When the tank is full, press the **PUMP / Grade I** key (fig. 22/4) and let flow at least 10 L of purified water through the filter.

6.9. **Menu of the unit** (figure 24). Additional settings for the unit are available by pressing the **Menu** key (fig. 22/2). To navigate the menu, use arrow keys (fig. 22/9), to select an item, press the **OK** key (fig. 22/10), to return to the previous level or to exit the menu – the **Menu** key.

Menu
Volumetric dispense ON
Parameters
Maintenance

Figure 24

6.9.1. Volumetric Dispense (figure 25). This menu item controls turning on the volumetric dispense and setting the dispensed water volume by pressing the **PUMP / Grade I** or **PUMP / Grade II** keys (fig. 22/4 or 22/12). Select the set dispense volume (0.01 to 10 L, with 0.01 L increment) using the up and down arrow keys. To change the next digit, press the **Mode** key (fig. 22/3). To confirm the changes, press the **OK** key.

 **Note.** You can set the volume by teaching the unit directly. Before dispensing, press the up-arrow key (fig. 22/9). Parameter Volumetric changes to Teach on a red background on display (figure 26). Dispense the necessary volume (see 6.10). Unit remembers the dispensed volume and uses it for the next dispensing.

Volumetric dispense ON
Choose dispense volume (L)
<b>0.20</b>
Use "Up" and "Down" to change value Use "Mode" to shift cursor Press "OK" to confirm value

Figure 25.

Grade I (µS/cm)		Stage	
<b>0.055</b>		Recirculate	
Total Organic Carbon		Temperature	
< 2 ppb		18.2°C	
Status	Dispense	Volumetric	Tank level
OK	Ready	Teach	OK

Figure 26.

## 6.9.2. Parameters (figure 27).

- Measurement units (figure 28). Choose between  $\mu\text{S} / \text{cm}$  or  $\text{MOhm} \cdot \text{cm}$ .
- Prevent dispensing poor quality (ON/OFF). Water dispense will not start until the water quality exceeds threshold.
- Recirculation (figure 29). Setup the recirculation schedule. First, the Recirculation period (figure 30): every 10, 25 or 50 minutes. Then, the Recirculation time (figure 31): 10, 14 or constantly (i.e., time equals period).
- Grade 1 alarm threshold (figure 32). Set the value above which the **Gr1 Error** will be triggered.
- DI alarm threshold. As in Grade 1 alarm, this is for the deionization module.
- RO alarm threshold. As in Grade 1 alarm, this is for the reverse osmosis membrane.

Parameters
Measurement units
Prevent dispensing poor quality: OFF
Recirculation
Grade 1 alarm threshold
DI alarm threshold
RO alarm threshold
Temperature compensation
Night mode: ON
Set time and date

**Figure 27.**

Measurement units
$\mu\text{S} / \text{cm}$
$\text{Mohm} \cdot \text{cm}$

**Figure 28.**

Recirculation
Recirculation period
Recirculation time

**Figure 29.**

Recirculation period
Min 10 minutes
Typical 25 minutes
Maximum 60 minutes

**Figure 30.**

Recirculation time
Min 10 minutes
Typical 14 minutes
Max = recirculation period

**Figure 31.**

Parameters
Enter Grade 1 limit ( $\mu\text{S}$ )
<b>0.100</b>
Use "Up" and "Down" to change value
Use "Mode" to shift cursor
Press "OK" to confirm value

**Figure 32.**

- Temperature compensation (figure 33). Turn on and off the DI and RO water temperature compensation that affects conductivity measurement.



**Note.** Measurement units, time and date must be set before using temperature compensation.

- Night mode (ON/OFF). Turn off the booster pump and oxidation UV lamps between 21:00 and 7:00.



**Note.** Time and date must be set before using night mode.

- Set time and date (figure 34). Set time and date as described on the display

Temperature compensation
DI temperature compensation: OFF
RO temperature compensation: OFF

**Figure 33.**

Parameters
Set time and date:
<b>2018-01-01 14:55:42</b>
Use "Up" and "Down" to change value
Use "Mode" to shift cursor
Press "OK" to confirm value

**Figure 34**

6.9.3. Maintenance (figure 35). Current menu item allows to do filter timer reset, clear errors, calibration or to check firmware version.



**Note.** After completing replacement procedure, be sure to reset filter timers.

Maintenance
Reset filter timer
Clear errors
Calibrate volumetric
Reset factory settings
Firmware version

**Figure 35**

6.10. Dispensing Grade I water. After rinsing (see **6.6**) and filling the tank (see **6.7**), remove the bell cap and place the vessel for purified water. Press the **PUMP / Grade I** key (fig. 22/4). Unit performs a 5 to 10 s internal rinsing and starts dispensing purified water.



**Note.** If the ultrafilter is installed, loosen the degassing valve (fig. 21/1), to remove the air bubbles.

Press the **Dispense** key again to stop the water dispensing. If the volumetric dispense is set (see **6.9.1**), then dispensing stops after set volume (fig. 22/11, Volumetric).

6.11. Dispensing Grade II water. After rinsing (see **6.6**) and filling the tank (see **6.7**), Grade II water is available from the storage tank Pro. Use the tap to fill the vessel with purified water.



**Note.** If the optional tank pump is installed, you can follow the steps in 6.9.3, only using the **PUMP / Grade II** key (fig. 22/12) instead of **PUMP / Grade I** key.

6.12. **Shutdown.** If the recirculation is not scheduled, shut down the unit. Put the unit in the OFF stage by pressing the **Run** key. Turn the power switch (fig. 9/6) into position **O** (off). Disconnect the mains plug from the socket. Shut off the feedwater access pipe.



# 7. Specifications

7.1. Biosan is committed to a continuous programme of improvement and reserves the right to alter the design and specifications of the equipment without additional notice.

## 7.2. Purified water specification

Water conductivity, Grade I .....	0.055 µS / cm
Grade II .....	< 0.1 µS / cm
Grade I water resistivity .....	18.2 MΩ x cm
TOC, Labaqua Trace .....	< 10 ppb
Labaqua HPLC & Bio, achievable.....	< 2 ppb
Labaqua HPLC & Bio, displayed.....	< 5 ppb



**Note.** To achieve TOC < 2 ppb, ensure storage tank cleanliness, regular filter and consumable replacement.

RNase (Labaque Bio).....	< 0.01 ng / mL
DNase (Labaque Bio).....	< 4 pg / µL
Bacteria .....	< 0.01 CFU / mL
Endotoxins, Labaque Trace & HPLC .....	< 0.15 EU / mL
Labaque Bio .....	< 0.001 EU / mL
Particles larger than 0.22 µm .....	< 1 / mL
Nominal water flow, Grade II .....	10 L/h
Dispenser water flow, Grade I .....	4 L/min
Grade II .....	2 L/min
Deionization module lifetime (standard) .....	1 m <sup>3</sup>
Regeneration.....	> 30 %

## 7.3. General specifications

Dimensions .....	320x560x620 mm
Weight, empty / operating unit, accurate within ±10%	
Labaque Trace .....	24 / 27 kg
Labaque HPLC .....	25 / 28 kg
Labaque Trace .....	26 / 29 kg
Storage tank volume .....	30 L
Noise level, 1 m from the unit.....	below 47 dB
Operating current and frequency.....	200–240 V~, 50/60 Hz
Power consumption.....	130 W
Fuse rating .....	220 V, 3 A
Feedwater pressure .....	0.5 – 5 bar
Feedwater conductivity.....	< 1300 µS / cm
Feedwater access connection.....	Ø 1/2" NPTF



**Note.** For in-depth requirements for feedwater quality, see 4.1.

## 7.4. Workroom specifications

Workroom description	Cold rooms and closed laboratory rooms, incubators (except CO <sub>2</sub> incubators)
Temperature range	+15 °C ... +30 °C
Humidity requirements	20–80% RH. Non-condensing atmosphere.
Operating height, maximum	2000 m ASL
Overvoltage category	II
Pollution degree	2

## 8. Ordering information

### 8.1. Models and versions available

Model and name	Version	Catalogue number
<b>Labaqu Trace</b> , water purification system	V.5A01	BS-070105-A02
<b>Labaqu HPLC</b> , water purification system	V.5A02	BS-070104-A02
<b>Labaqu Bio</b> , water purification system	V.5A03	BS-070106-A02

8.2. To inquire about or order optional or replacement parts, contact Biosan or your local Biosan representative.

#### 8.2.1. Optional parts

Description	Catalogue number
External pre-filter set (1 µm filter, carbon) with manometer	BS-070104-KK
External pre-filter set (1 µm filter, carbon, polyphosphate) with manometer	BS-070104-LK
Storage tank "Comfort" 60 L w/ base, tap and multipoint level switch	BS-070104-SK
Storage tank "Comfort" 100 L w/ base, tap and multipoint level switch	BS-070102-FK
IQ/OQ/PQ/DQ documentation	BS-070104-HK
Universal remote dispenser with 3 m supply hose	BS-070104-JK
External input pressure reducer (for tap water systems)	On request

#### 8.2.2. Replacement parts

Description	Catalogue number
Pre-filter cartridge set	BS-070104-AK
Deionization module set	BS-070104-IK
Polishing module set	BS-070104-BK
UV-lamp for sterilization, 254nm (only for <b>Bio</b> )	BS-070104-RK
UV-lamp for photooxidation, 185nm (only for <b>HPLC</b> and <b>Bio</b> )	BS-070104-DK
0.22 µm microfilter (non-sterile, only for <b>Trace</b> and <b>HPLC</b> )	BS-070104-EK
0.22 µm microfilter (sterile, only for <b>Trace</b> and <b>HPLC</b> )	BS-070104-FK
Ultrafilter (only for <b>Bio</b> )	BS-070104-GK
Replacement RO membrane	BS-070104-NK
0.22 µm air vent filter for the storage tank	BS-070102-AK
Replacement RO double 20lph	BS-070104-OK
Filter set for BS-070104-KK (carbon/PP, 1 µm PP)	On request
Filter set for BS-070104-KK (polyphosphate, carbon/PP, 1 µm PP)	On request

## 9. Care and maintenance

### 9.1. Service.

9.1.1. If the unit is disabled (e.g., no water dispensing, no reaction to key presses, etc.) or requires maintenance, follow the troubleshooting table below. If the problem persists or is not listed, disconnect the unit from the mains and contact Biosan or your local Biosan representative.

9.1.2. All maintenance and repair operations, except mentioned below, must be performed only by qualified and specially trained personnel.

### 9.1.3. Troubleshooting

**Table 4. Troubleshooting**

Problem	Solution
Switching from Filling Tank stage mode to Low Pressure and back	Replace pre-filters (fig. 15) Check the feedwater pressure. Required pressure is 0.5 bar or higher
Low Pressure stage mode	Replace pre-filters (fig. 15) Replace feedwater access pipe suspended particle filters (fig. 4) or contact Biosan for a solution Check if solenoid valve is in order, contact Biosan for a solution
Status display shows <b>RO Error</b>	Replace RO module, contact Biosan for a solution
Status display shows <b>DI Error</b>	Replace deionization module (fig. 11)
Status display shows <b>Gr1 Error</b>	Replace polishing module (fig. 11)
Status display shows <b>Prefilt. Error</b>	Replace pre-filters (fig. 15)
Conductivity value is "...."	Conductivity sensor is empty (not filled with water) Check the operation dongle (see <b>5.10</b> ) Water quality is below 10 µm
Conductivity value is in the 1.0–1.5 µS/cm range and does not change	Validation dongle is connected. Replace with the operation dongle (see <b>5.10</b> )
Resistivity value is in the 0.6–0.9 MOhm*cm range and does not change	
Temperature value is "--.-"	Temperature sensor is not connected or damaged
TOC value is "----"	TOC has not been measured yet. Wait until at least one recirculation cycle completes (approximately 1 hour)
Sound signal during Filling Tank stage	Replace UV sterilization lamp, contact Biosan for a solution
Sound signal during and after Recirculation and Dispense modes	Replace UV photooxidation lamp, contact Biosan for a solution

### 9.2. Cleaning and disinfection.

9.2.1. Use mild soap and water with a soft cloth or sponge for cleaning the exterior. Rinse remaining washing solution with distilled water. Wipe dry the excess water with clean, soft cloth or sponge.

9.2.2. To disinfect the exterior plastic and metal parts, use 75% ethanol or DNA/RNA removing solution (e.g., Biosan PDS-250). After disinfecting, wipe the surfaces dry.

9.2.3. No parts of the unit are autoclavable.

### 9.3. Recirculator disinfection.

- Fill the tank (see 6.7) or use a partially filled tank with a disconnected level sensor (fig. 18);
- Put the unit in the StandBy stage by pressing the **Run** key;
- Remove the polishing module (see 9.6.3);
- Connect the module fittings in the unit with a bypass tube (fig. 33);



**Figure 33. Inserted bypass tube.**

- Remove the storage tank lid (fig. 10/3) and add hydrogen peroxide solution to the tank so that the final concentration would be approximately 1% by volume;



**Caution!** 30% hydrogen peroxide solution can damage polypropylene components. Use appropriate containers and protective equipment when working with unsafe liquids.

- Put the unit in the Recirculate stage by pressing the **Run** key;
- Setup the recirculation period to 10 minutes, recirculation time to 5 minutes (see 6.9.2.3);
- Allow the unit to recirculate for 4–6 hours;
- Remove the microfilter or ultrafilter (fig. 18 & 19) and the water level sensor cable (fig. 18). Dispense approximately half of the solution;
- Connect the water level sensor cable and fill the tank;
- Remove the water level sensor cable and allow the unit to recirculate for approximately 1 hour;
- Dispense all water and repeat two previous steps;
- Dispense all water and put the unit in the StandBy stage by pressing the **Run** key;
- Remove (with the tool from figure 5) the bypass tube;
- Replace the polishing module, and microfilter or ultrafilter. Procedure is complete.

**9.4. Service schedule.** Use only the components recommended by the manufacturer. Replace components according to the table below:

**Table 5. Component replacement period**

Replacement part	Replacement period	Note
Pre-filter cartridges	When the filters are clogged or every 6 months. Replace both simultaneously.	Stage changes between Filling tank and Low pressure
Deionization module	On <b>DI Error</b> or when Grade II conductivity exceeds 0.5 $\mu\text{S}/\text{cm}$	
Polishing module	On <b>Gr1 Error</b> or when Grade I conductivity exceeds 0.1 $\mu\text{S}/\text{cm}$	Depends on water usage
Sterilization UV lamp	As required (every 2 years on average)	For model Bio
Oxidation UV lamp		For models HPLC & Bio

Replacement part	Replacement period	Note
0.22 µm filter dispenser	Every 3–6 months	For models Trace & HPLC
Ultrafilter	Every 6–12 months	For model Bio
External pre-filter cartridges	~400 working hours or together with internal pre-filters	

**9.5. Filter and module replacement.** After completing replacement procedure, be sure to reset filter timers, see **6.9.3** (Menu/Maintenance/Reset filter timer).

**9.5.1. Microfilter and ultrafilter dispensers.** Put the unit in the OFF stage by pressing the **Run** key and unscrew the filter. Replace with a new one according to **5.9**.

**9.5.2. Pre-filter cartridges.**

- Put the unit in the OFF stage by pressing the **Run** key;
- Open the side door;
- Remove the old filters by turning them to the left for a quarter turn, then by pulling down;
- Replace with a new set according to **5.6.2**.



**Note.** Replace both cartridges at the same time.

**9.5.3. Polishing module.** To replace, use the tool on figure 5.

- Put the unit in the OFF stage by pressing the **Run** key;
- Open the side door;
- Insert the tool under the right-angle fitting (fig. 34/a) and press down (fig. 34/b);
- Rotate the fittings inside (fig. 34/c) and remove the old module;
- Replace with a new one according to **5.6.1**.

**9.5.4. Deionization module.** Replacement is identical to polishing module replacement. Temporarily remove the pre-filter cartridges (see **9.6.1**).



**a**



**b**



**c**

**Figure 34. Polishing and deionization module replacement.**

**9.6. Emptying the tank.**

- Drain all available water from the tank by tap (fig. 10/5);
- Remove the tube from the REC IN fitting on the rear panel of the unit (fig. 9/9) and drain the remaining water. Reattach the tube.

# 10. Storage and transportation

10.1. Store and transport the unit in a horizontal position (see package label) at ambient temperatures between -20°C and +60°C and maximum relative humidity of 80%.

10.2. After transportation or storage and before connecting it to the electric circuit, keep the unit under room temperature for 2-3 hrs.

# 11. Warranty

11.1. The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.

11.2. The warranted service life of the unit from the date of its delivery to the Customer is 24 months. For extended warranty, see 11.5.

11.3. Warranty covers only the units transported in the original package.

11.4. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment report shall be compiled, certified and sent to the local distributor address. To obtain the claim form, visit **Technical support** page on our website at link below.

11.5. Extended warranty. Contact your local Biosan representative or our service department through the **Technical support** section on our website at the link below.

Technical support



[biosan.lv/en/support](https://biosan.lv/en/support)

11.6. The following information will be required in the event that warranty or post-warranty service comes necessary. Complete the table below and retain for your records.

Model	Serial number	Date of sale
Labagua Trace, Labagua HPLC, Labagua Bio, Water purification system		

# 12. EU Declaration of conformity

12.1. Water purification systems **Labagua Trace**, **Labagua HPLC** and **Labagua Bio** are in conformity with the following relevant Union legislations:

<b>LVD 2014/35/EU</b>	<b>LVS EN 61010-1:2011</b> Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements.
<b>EMC 2014/30/EU</b>	<b>LVS EN 61326-1:2013</b> Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements.
<b>RoHS3 2015/863/EU</b>	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
<b>WEEE 2012/19/EU</b>	Directive on waste electrical and electronic equipment.

12.2. Declaration of Conformity is available for download on the page for the relevant model on our website by links below, in the **Downloads** section:



[Labagua Trace](#)



[Labagua HPLC](#)



[Labagua Bio](#)

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Edition 5.04 – April of 2025