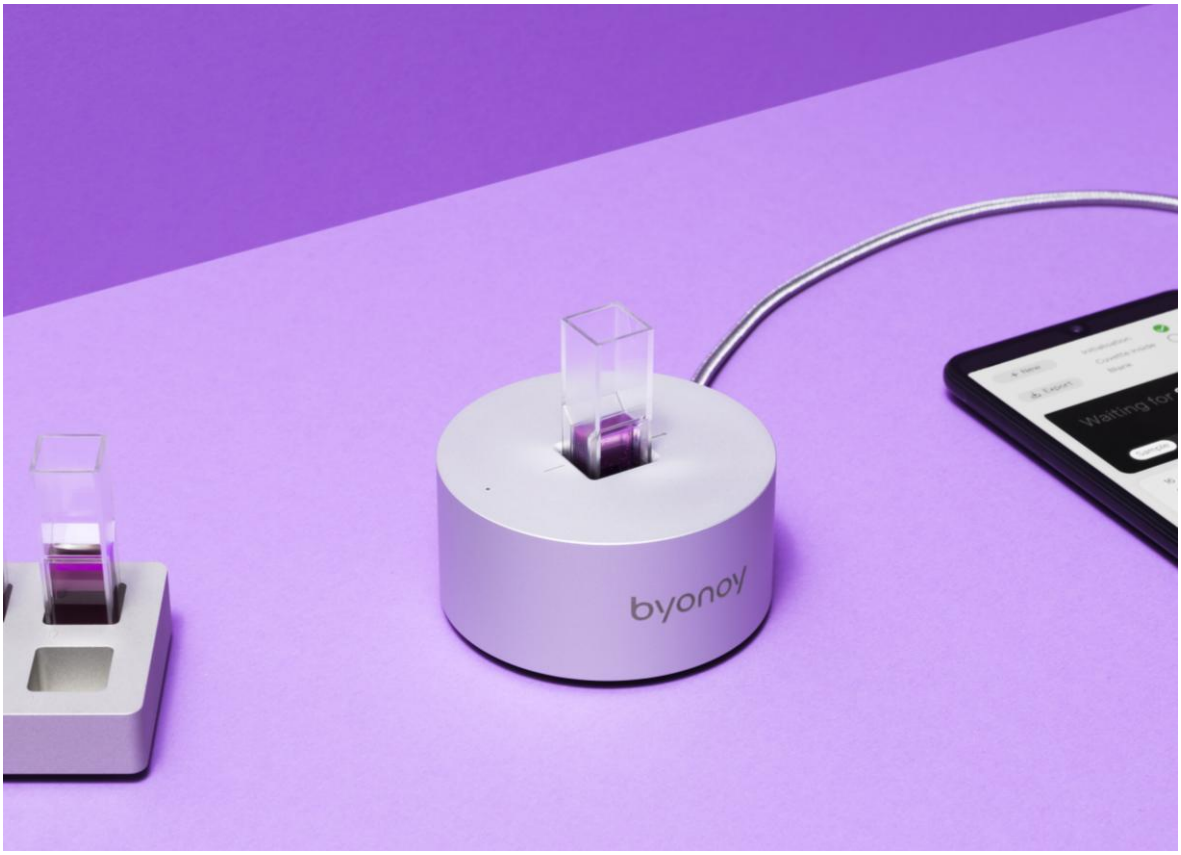
byonoy

Instructions for Use

Absorbance One

Valid for REF Number ABS CU A 01



Instructions for Use
Absorbance One
Version 3.1 (01/08/2025)

Manufacturer: Byonoy GmbH
Schützenstraße 21
22761 Hamburg, Germany

00 49 40 5379 866 00
service@byonoy.com
www.byonoy.com

Dear customer,

We are delighted that you have chosen the Absorbance One. To take full advantage of the instrument's performance and to enjoy your instrument for many years, please read these instructions for use carefully before installation and commissioning. Operate the instrument in accordance with these instructions. The operating-safety and function of the instrument can only be guaranteed if both the general safety regulations and accident prevention regulations of the legislator as well as the safety instructions in this manual are observed. We accept no liability for any damage resulting from improper use or incorrect operation.

ⓘ **Ensure that the manual is always accessible and is read and understood by all persons operating the instrument.**

This document is subject to technical changes and updates.

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1 General information

Important: Follow the instructions for use

Any commissioning or handling of the instrument requires precise knowledge and notice of this manual. The device is intended for the described use only.

In this manual and on the label of the reader, particularly important remarks are labeled as followed:

Symbol	Description
	**Caution: Caution indicates a potentially hazardous situation, which, if not avoided, could result in minor or moderate injury.**
	**Information: This is a piece of information indicating certain properties that must be observed.**
	**Marking that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area.**
	**Certification mark employed on electronic products manufactured or sold in the United States.**
	**Disposal of used electrical and electronic equipment**
	**Device Manufacturer**
	**Serial number**
	**Catalogue number**

Liability for function and damage

Liability for the function of the device shall, in any case, pass to the owner or operator if the device is improperly maintained, repaired, or modified by persons who do not belong to the authorized service personnel, or if it is handled in a way that does not comply with its intended use. The service and operation of the product must be in accordance with this manual. Byonoy shall not be liable for damages resulting from non-observance of the information above. Warranty and liability conditions of the terms of sale and delivery of Byonoy are not extended by the information above.

Information

ⓘ **An incorrect working environment can lead to a reduction in service life, damage to the device, or measurement errors.**

ⓘ **To avoid measurement errors, it is essential to ensure that the instrument is connected properly and that the experiments are carried out correctly.**

ⓘ **Incorrect cleaning of the instrument can reduce its service life and can cause damage to the instrument.**

ⓘ **Follow all safety instructions on the device and in the attached documents.**

ⓘ **Follow all general precautions that apply to electrical instruments.**

Disposal of used electrical and electronic equipment

The symbol on the product or its packaging indicates that this product is not to be treated as normal household waste. It must be disposed of at a collection point for the recycling of electrical and electronic equipment. By contributing to the correct disposal of this product,

you protect the environment and the health of your fellow human beings. Recycling helps to reduce the consumption of raw materials. For further information on how to recycle this product, please contact your local authority or municipal waste disposal centres.

Byonoy offers a return option for this product, possibly with a fee. For information regarding the return and disposal process, please contact the service.
Email: service@byonoy.com
Telephone: +49 40 5379 866 00

Working with biological and harmful material

The Absorbance One is **not** to be used for the measurement of biohazardous substances.

Always observe the manufacturer's hazard information pertaining to the substances to be measured.

The instrument does not produce any toxic or harmful gases or substances. During the measurement, make sure that there are no toxic or harmful substances in the cuvette.

2 Overview of the Absorbance One

2.1 Scope of application

The Absorbance One is an optical laboratory instrument for measuring the absorbance (optical density) of biological or non-biological samples in cuvettes, according to the specifications described in this user manual. The Absorbance One is intended for research and other non-in-vitro-diagnostic analyses only. It is to be operated by trained laboratory personnel and is intended for professional use.

2.2 Measurement method

The Absorbance One is designed to carry out sensitive absorbance measurements. It measures the optical density (OD) of samples at defined wavelengths.

Absorption

Absorption refers to the amount of light absorbed by a medium. Absorption reduces transmission. Transmission is the ratio of incident to transmitted light. Accordingly, the degree of transmission is calculated as follows

$$T = (I/I_0)$$

where I is transmitted light and I_0 is incident light.

Optical Density

Optical density is a measure of the attenuation of light radiation after it has passed through a medium. Optical density is the logarithmic quantity that describes the reciprocal of the transmittance T:

$$OD = log(I_0/I)$$

where I is the transmitted light and I_0 is incident light.

Optical density is the absorbance of the sample plus other attenuating effects such as scattered light due to turbidity. It is therefore necessary to avoid scattered light in order to measure absorbance correctly.

If no other attenuating effects are present, absorbance = optical density.

2.3 Absorbance One System

Absorbance One Reader

The Absorbance One is an absorbance-based measuring device, i. e. a measuring instrument, with which the absorbance values of a cuvette can be read, recorded and provided for further processing. The Absorbance One is a solid-state, single-beam, single-wavelength cuvette photometer.

The cuvette is inserted manually into the slot from top of the device. An LED is used as a status indicator for the device.

On the back of the Absorbance One there is a USB-C port for connecting the instrument to a computer via the included USB-C cable.

Power consumption

The Absorbance One is an analytical instrument with very low power consumption. It is powered by a USB-C cable and the total power consumption is generally less than 2.5 watts.

Absorbance One App

The Absorbance One App is used to operate the Absorbance One Reader and process the results. After the App is started and the reader is connected, the main window appears automatically.

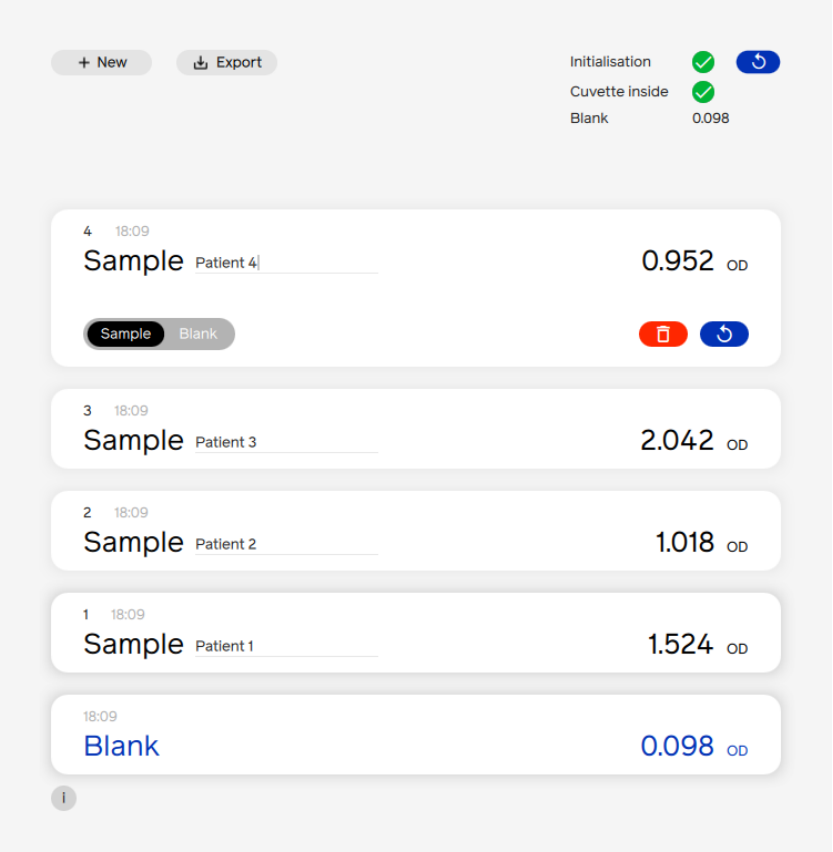

Figure 1. Overview of the Absorbance One App.

The Absorbance One App displays every measurement as a separate card. Multiple measurements are then correspondingly arranged in a stack. Two buttons are arranged in the upper left corner, and a series of status indicators are displayed on the right.

2.4 Consumables

With the Absorbance One, Macro, Semi-micro and Micro cuvettes can be used.

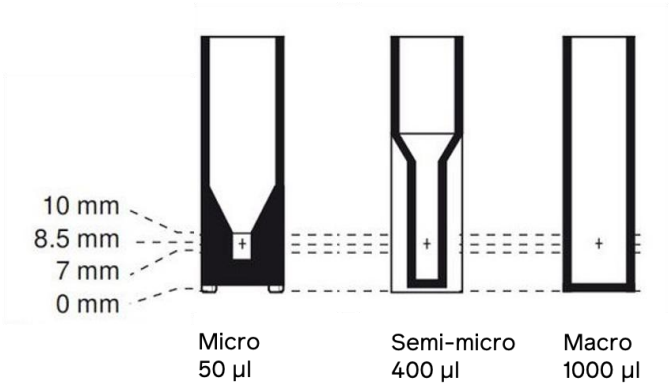

Figure 2. Type of cuvettes, which can be used with the Absorbance One. The height of the light path is at 8.5 mm.

When using cuvettes, always check the specifications of the cuvette manufacturer. Not all cuvettes of a particular manufacturer are the same in design, materials, or configuration.

3 Preparing the product for use

3.1 Unpacking, storage, and transport

Unpacking

Remove the packaging material and carefully place the device on a firm and level surface. Check the device for external damage and check the materials supplied (see chapter 3.2).

The device is packed in a specially designed cardboard box. Keep the packaging material. If the device must be returned for repair, the original packaging material must be used.

Storage and protection during the intervals of normal use

ⓘ **Protect the device from dust during prolonged storage.**

ⓘ **When storing the device, ensure that the temperature and humidity are within the specified range (see chapter 7).**

Transportation

Before transportation, unplug the instrument and ensure there is no cuvette inside the device. Depending on the transport distance, use the original packaging material. Make sure that the new location meets the requirements described in chapter 3.3.

ⓘ **For transport, ensure the product is well-packaged to avoid damage in transit.**

3.2 Supplied materials

When unpacking the device, please check that the following components are present:

- Absorbance One Reader
- USB-C cable

3.3 Working environment

Due to its small size, the Absorbance One can be operated very well in various working environments.

However, the following information should be observed. Ignoring it may lead to measurement errors and a reduction in the expected lifetime of, or damage to, the device:

ⓘ **The device should stand on a level surface, free from dust and vibrations.**

ⓘ **Do not operate the device near heat sources or under direct sunlight.**

ⓘ **When operating the device, ensure that the temperature and humidity are within the specified range (see chapter 7).**

ⓘ **Place the instrument in a horizontal position secured against falling.**

3.4 App installation procedure

The Absorbance One App (validated versions ≥ 1.2.0) is compatible with Windows 10. Byonoy may release software updates after publication of this IFU and confirms that the device's RF characteristics will continue to comply with all applicable CE requirements (see Declaration of Conformity in the annex) after any authorized update and that no additional safety risks will be introduced.

To install the Absorbance One App, visit the following webpage: https://byonoy.com/download-hub. Download the latest version of the App for your operating system and follow the steps in the Setup Wizard to complete the installation.

ⓘ **To install the App on the computer, the user must have administrator rights or obtain such permissions.**

Uninstalling the software

The Absorbance One App can be uninstalled using the computer's standard uninstall procedure.

4 Operation

Before commissioning the Absorbance One, you should carefully read and understand the entire manual to familiarize yourself with the system.

4.1 Computer connection

The Absorbance One requires a connection to the computer for power supply, starting an experiment, and data transfer. Insert the USB-C cable into the Absorbance One and the USB port of the computer. The Absorbance One starts automatically when connected to a computer via the USB-C cable and the software automatically establishes a connection.

⚠ **Always use the included USB-C cable for the connection to your computer.**

⚠ **Connect the instrument directly to your computer and do not use an external USB hub.**

ⓘ **The device may only be operated at a USB port USB 2/USB 3 with 5 VDC and a maximum of 3 A of a certificated computer (with certification mark of an approved testing laboratory). Use an adapter cable on USB 3.1 with type C plug connection, which ensures the profile 1: 5 V@2.0 A.**

When the Absorbance One is switched on, the LED status light on the top of the instrument will illuminate. Each time the instrument is switched on, an internal self-test is performed to ensure there are no malfunctions.

4.2 Initialisation

An initialization occurs automatically after connection of the device to the computer and is repeated at regular intervals thereafter. The initialization determines the zero point, which is applied for the next measurement. The initialization can only be performed when the slot is empty, and no cuvette is inside the device.

4.3 Perform a measurement

The Absorbance One has an auto-measurement function. Upon insertion of a cuvette, measurement is triggered automatically, and the result is immediately displayed in the App.

During measurement, the status LED will display an amber colour. After measurement, the status LED will turn green, and the result of the measurement will be displayed as a white card in the App.

To guarantee a correct measurement result, please pay attention to the following information:

ⓘ **When inserting the cuvette, pay attention to its alignment, as cuvettes have a designed direction.**

ⓘ **Do not touch the device or the cuvette during measurement.**

ⓘ **The side walls of the cuvette must be dry before it is inserted into the instrument.**

ⓘ **Insert the cuvette quickly and release it during measurement.**

4.4 Results

After a successful measurement, the results will be automatically shown in the App.

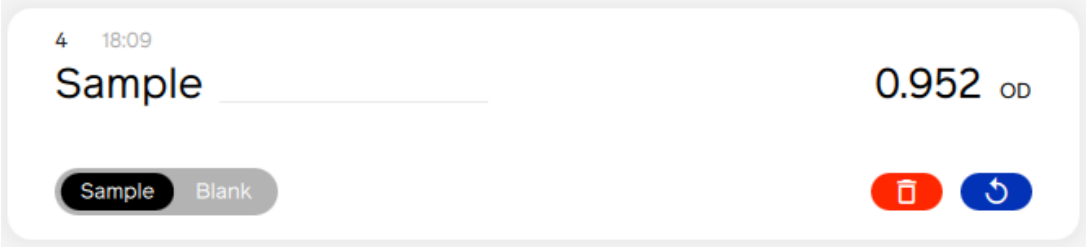

Figure 3. Sample card.

By clicking on the card, the following functions are available:

- The result can be designated as a Sample or a Blank.
- In the Sample Card, an ID can be assigned.
- The result can be deleted.
- The measurement can be repeated.

ⓘ **If a blank is defined, all the other cards are automatically blank corrected.**

Via the “Export” button, the results can be exported as a PDF report or CSV file.

The “New” button will delete all measurement cards and results.

5 Signals and troubleshooting

5.1 Signal lights

Table 1. Explanation of the signal lights

Activity of the signal light	Meaning
White, blinking	Self-test is being performed
White, continuous	Ready for measurement
Amber	Measuring
Green	Measurement complete
Red	Hardware error

5.2 Troubleshooting

Failed auto initialisation

The Absorbance One features an auto initialisation. In rare cases, the auto initialisation fails. This can be recognized in the App, as the initialization will not be confirmed, and on the device itself, where the status LED will show green although no cuvette is in the device. In this case, the initialization must be triggered manually. Ensure the slot is empty and no cuvette is inside, then click the repeat button next to the initialization status indicator in the upper right corner of the software. The status LED will turn white, whereupon the device is ready for the measurement.

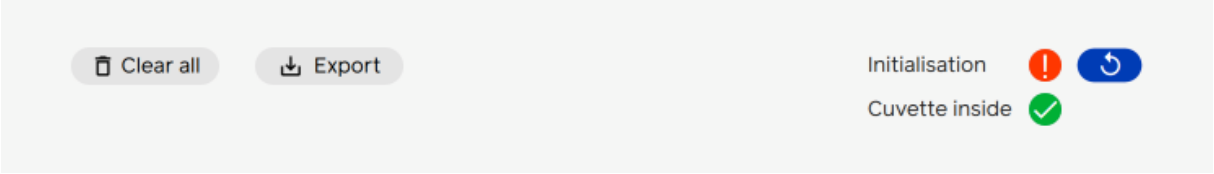

Figure 4. Failed auto initialisation.

Error codes

In the case of an issue with the device, error codes will appear in the software.

Table 2. Description of error codes

Type of Error	Cause	Solution
Ambient light error	Too much ambient light is reaching the device, or the device is defective.	Reduce the amount of ambient light present.
Insufficient light error	The device is dirty, the slot is occupied, or the device is defective.	Please clean the slot and remove obstructions.
Unrecoverable error, Hardware error	Critical error.	Contact customer support.*
Timeout error	The measurement was disrupted by a shadow in the device.	Repeat the measurement. Ensure the cuvette is not disturbed during the measurement and no shadow is cast on the slot.
Noise limit error	USB cable/USB hub problem or defective device.	Please contact customer support.
Device communication error	Communication with device not possible.	Please reconnect device.
Device is disconnected	Error communicating with the device.	Please reconnect device.

*Please send the logfile to customer support. The logfile can be found under *"C:\Users\(username)\AppData\Local\VirtualStore\Program Files\(x86)\Byonoy\Absorbance One App\app".* Alternatively, you can search "AbsorbanceOneApp.exe.log" in your file browser.

6 Maintenance and cleaning

6.1 Maintenance

The Absorbance One is maintenance-free. Each time the instrument is switched on, an internal self-test is carried out to ensure there are no malfunctions.

There are no parts within the Absorbance One that can be serviced by the customer. It is only necessary to ensure that the device is kept clean.

The accuracy, linearity and reproducibility of the device can be checked by the manufacturer. Please contact the manufacturer.

6.2 Cleaning

Before cleaning, detach USB-C cable from the instrument and remove the cuvette.

Cleaning the housing

The surfaces of the housing should be cleaned regularly. This can be done using a moistened cloth or similar textile. Do not soak the cloth. Wipe away any residual moisture from the surface of the device. Do not use scouring agents.

Cleaning the slot and the optical components

To clean the slot of the Absorbance One, use cotton swaps. If needed, the cotton swaps can be slightly soaked with 80% ethanol to carefully remove dust or contamination. Carefully clean the center of the filter and lens, which are in the optical path. See Figure 4 for a detailed view of the filter and lens position.

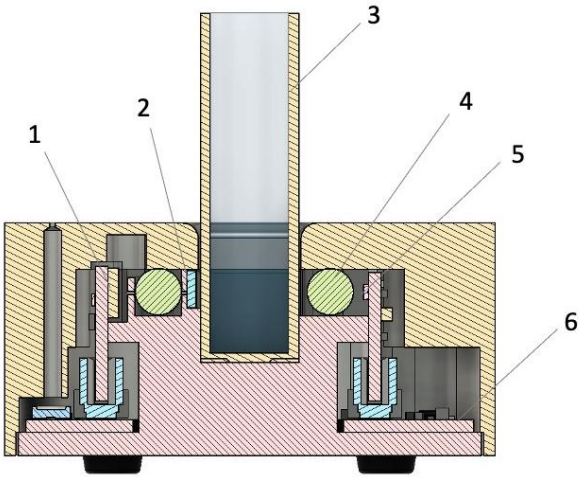

Figure 5. Cross section of the reader with inserted cuvette. 1 LED, 2 Filter, 3 Cuvette, 4 Ball lens, 5 Photodiode, 6 PCB Board.

Information and warnings for cleaning

When cleaning, pay attention to the following information. Failure to observe this information may result in damage to the instrument. This can lead to a reduction of the service life or measurement errors:

ⓘ **Always avoid spraying liquid directly onto the surfaces of the Absorbance One. This is especially important for the inside of the slot, where there are optical elements that are very sensitive and essential for the functioning of the instrument.**

ⓘ **Never clean the inside of the slot with sharp or abrasive scourges, and do not use aggressive solvents or corrosive agents.**

⚠ **Biological hazard: Always wear gloves during cleaning operations that may involve contact with biological or generally hazardous materials or liquids.**

6.3 Technical support

In case of problems with the instrument, please contact the manufacturer's service department or your local representative.

Biological hazard: It is your responsibility to decontaminate the instrument and all accessories before servicing and before returning the instrument or accessories to the manufacturer.

For decontamination of the Absorbance One, follow the government guidelines for inactivation of organisms used in biological laboratories.

6.4 Repairs

Repairs on the device may only be carried out by the manufacturer. Please contact the service department. The product warranty is voided if the device is modified by unauthorized persons, or different parts are installed.

7 Technical specifications

Table 3. Performance and technical data

Parameter	Value
Type of product	Single beam, single wavelength cuvette photometer
Product name	Absorbance One
Housing material	Aluminium
Temperature (storage/operation)	5–50 °C
Relative tolerated humidity (storage/operation)	Max. 70 %
Measurement method	Absorbance
Cuvette types	Macro, Semi-micro and Micro cuvettes
Light source	LED
Light path height	8.5 mm
Light beam diameter	2 mm
Wavelength range	340-1000 nm
Detection	Photodiode
Measurement range	0–5.0 OD
Resolution	0.001 OD
Accuracy*	≤ 0,5 % + 0.005 OD from 0.0–3.0 OD
Reproducibility**	≤ 0.5 % + 0.005 OD from 0.0–3.0 OD
Linearity***	≤ 0,5 % from 0,0–3.0 OD
Connection to computer	USB 2/USB 3 with 5 VDC and max. 3 A
Dimensions	33 mm x Ø 64 mm
Power supply	5 VDC
Nominal value/Characteristic of the fuse	1 A/very fast-acting
Power input	2.5 W
Weight	150 g

* Accuracy is the maximum deviation between the determined value and the true value.

** Reproducibility is the maximum deviation between the determined values when the measurement is repeated directly.

*** Linearity is the maximum deviation between the true and the determined increase of the value.

8 Guarantee

The standard warranty period of the Absorbance One is 24 months. If a defect manifests itself in your device during the warranty period, please contact the service department directly.

The instrument may only be operated in technically perfect condition. In the event of defects that could endanger employees or third parties, the device may only be used again after it has been repaired by the manufacturer.

This warranty does not cover damage caused by improper use or external mechanical influences, transport damage, or unauthorized intervention in the device by unauthorized persons.

9 Compliance

9.1 FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Responsible Party – U.S. Contact Information:
Americas Compliance Consulting LLC dba iCertifi
2445 NE Division Street, Suite 202
Bend, Oregon 97703 USA
FCC_sDoC@icertifi.com
icertifi.com

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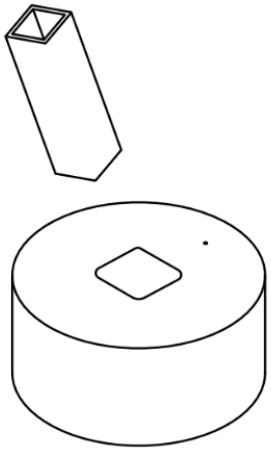
EU Declaration of Conformity



Byonoy GmbH
Schützenstraße 21
22761 Hamburg
GERMANY

The Product named below fulfills the relevant fundamental requirements of the EU directives and standards listed. This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product Type
UV/VIS Spectrometer

Product name
Absorbance One

Model Number
DE CMA

Serial Number Range
BYOABSCUXXXXX
[XXXXX = 00001 – 99999]

Software
Absorbance One App - Any future software updates will be released only if the product continues to meet all applicable EU requirements, including the EMC Directive 2014/30/EU and the RoHS Directive 2011/65/EU.

Relevant EU directives

2014/30/EU	Elektromagnetische-Verträglichkeit-Richtlinie (EMV)
2011/65/EU	Restriction of Hazardous Substances (RoHS)

Relevant EU standards

EN IEC 61326-1:2021	Electromagnetic Compatibility (EMC) - Electrical equipment for measurement, control and laboratory use
EN 61010-1:2010/A1:2019	Safety requirements for electrical equipment for measurement, control & laboratory use – Part 1
EN IEC 63000:2018	Technical documentation for the assessment of electrical and electronic products (EEE) with respect to the restriction of hazardous substances (RoHS)

Hamburg, 25.07.2025

Yousef Nazirizadeh
CEO