



User Manual

Corona process

Knowledge of this manual is required for the operation of the device. Therefore, please familiarize yourself with its contents and pay special attention to information concerning the safe handling of the device.

We reserve the right to make changes in the interest of technical advancement. The user manual is not covered by an update service.

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1 About this User Manual

1.1 Introduction

Welcome Welcome to the **Corona process** User Manual.

The **Corona process** spectrometer system has been developed especially for use in the food industry.

The optical concept enables the determination of the ingredients and color of solid and pasty organic materials at a distance of 90–600 mm to the sample.

Depending on the chemometric model used, the wavelength range of 380–1650 nm enables the determination of moisture, protein, fat and other ingredients and of the color, e.g. for process optimization and control in the manufacture of foodstuffs.

The accessories adapted to the application areas of the **Corona process** enable simple and fast integration in its facilities and systems.

Purpose of this manual The information contained in this User Manual will enable you to install the **Corona process** spectrometer system properly and operate it safely and effectively. Furthermore, it will provide you with information on maintenance and troubleshooting.

Please familiarize yourself with the contents of the User Manual and observe all of the general and safety-related instructions it contains.

Audience The **Corona process** spectrometer system may be installed, operated and maintained only by qualified and properly instructed personnel.

This User Manual is therefore aimed at the qualified personnel authorized to perform the installation on-site as well as at other authorized persons in order to enable them to perform their duties.

Experience in handling metrology equipment and technical or scientific training are required.

Storage Store the User Manual and all other applicable documents you received on purchasing and accepting delivery of the device together in a safe place.

Make sure that the User Manual and all other valid documents are freely available to every user at all times.

Other applicable documents

- ZEISS InProcess software description: "InProcess Manual"
- Description of the license activation: "ZEISS License Activation Manual"
- Delivery notes

1.2 Use of safety instructions

The safety instructions in this User Manual stipulate various hazard levels, depending on the risk classification concerned.



Warning

Dangerous situation – Failure to observe this safety note could result in serious injuries or even death.



Caution

Dangerous situation – Failure to observe this safety note could result in slight injuries or property damage.



Note

General reference to important or useful information concerning the device and its operation.



Note

Important note on environmental protection.

1.3 Formattings and text conventions

"Bold" character format

- for texts which are used in the software, e.g. names of buttons, tools, menus, ...
- for keyboard commands, e.g.: **Ctrl + C**
- for product designations

Instruction manuals

Requirements

- Stands for a requirement that must be fulfilled in order to successfully perform the upcoming action.

Procedure

- 1 Stands for an action step to be executed.

2 Safety

2.1 Intended use

The **Corona process** is a spectrometer which was developed especially for use in the food industry. It is used to determine the ingredients and color of solid and pasty organic materials in diffuse reflection at a distance of 90–600 mm to the sample.

The **Corona process** can be installed in ATEX Zone 22 and is protected against dust and temporary immersion (IP67).

The spectrometer may only be used for its intended purpose as described.

Any other use is contrary to its intended purpose. The operator alone shall be held liable for any damage resulting from improper use. In this case, any warranty claim is null and void.

2.2 Conformity

The **Corona process** was designed and tested according to the currently applicable directives and standards and left our factory in perfect condition. To maintain this state and ensure safe operation, all instructions and warning notes listed must be observed.

The following directives, standards and classifications were applied and observed within the scope of the CE Declaration of Conformity.

DIN EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
DIN EN 60079-0	Safety regulations for potentially explosive atmospheres
DIN EN 61326-1	Safety requirements for electrical equipment for measurement, control, and laboratory use
IP67	Enclosure protection degree as per DIN EN 60529
III	Protection class (protection by low voltage) according to DIN EN 61140
Zone 22	Potentially explosive atmospheres
⊕ II 3D Ex tc IIIC T70 °C	Explosion Protection Marking:
	⊕ Ex marking according to 94/9EC
	II Equipment group
	3D Category 3D Zone 21/22
	EX tc Protection by enclosure
	IIIC Conductive dust
	T70 °C Max. surface temperature
CE	The devices bear the CE marking

2.3 Safety instructions

Warning



ELECTRICAL ENERGY HAZARD

The device may be operated only at the operating voltage specified in Section 8 "Technical data".

Before performing maintenance and repair work or replacing components, the respective device must be disconnected from all power sources. Please also ensure that it cannot be accidentally switched on again.

The Corona process must not be operated in damaged or damp condition.



RISK OF EXPLOSION

The device must not be opened in a potentially explosive atmosphere.

It is prohibited to mount the plugs with a higher torque than 15 Nm in order to guarantee the tightness and the explosion protection of the spectrometer.

Please also note that the power supply unit must not be used in a potentially explosive atmosphere. Unplug the power connector of the device only when the device is deenergized.

Caution



GENERAL RISK

The Corona process, including its original accessories, must be used for the purposes described in the present User Manual. The manufacturer cannot be held liable for any other use.

Warning signs and safety instructions must not be removed and must always be clearly legible.

The devices may be operated only by properly trained personnel. This personnel must be instructed concerning the possible risks when the device is in operation and in the appropriate applications.

The device is sealed very tightly; therefore, do not open it.

Modifications or repairs of the device and any other devices operated together with the Corona process may be performed only by Service employees or authorized personnel. The manufacturer shall not be liable for damage caused by inadmissible actions performed on the device. In addition, such inadmissible interventions shall render all warranty claims null and void.

Caution



RADIATION ENERGY HAZARD

Never look directly into the measuring beam. The bundled light of the halogen lamp can cause eye damage.



THERMAL ENERGY HAZARD

Caution: Hot surfaces.



GENERAL RISK

The personnel designated to perform the maintenance and repair work must be appropriately qualified for this work.

Apart from the work described in Section 7 "Maintenance", it is prohibited to perform any other interventions on the device. Otherwise the device may be irreparably damaged.

The device may be opened only by ZEISS service engineers or by other persons authorized by ZEISS.

Note



Defective equipment must not be disposed of with household waste, but should be disposed of in compliance with the applicable legal requirements.

2.4 Environmental management



Our company has implemented a certified environmental management system that complies with ISO 14001. This product was developed, inspected and produced in accordance with the applicable environmental regulations and directives of the European Union.

The product and its accessories comply with EU Directives 2002/95/EC (RoHS) and 2002/96/EC (WEEE) to the extent applicable to this product.

We have installed a take-back and recycling process that ensures proper recycling in accordance with the above-mentioned EU Directives.

For details concerning disposal and recycling, please contact your local dealer or service organization. The system must not be disposed of as domestic waste or be disposed of via municipal waste disposal facilities.

If the product is resold, the seller is obligated to inform the purchaser regarding its proper disposal.

2.5 Limitation of liability and warranty

Carl Zeiss Spectroscopy GmbH will not accept any warranty claims and shall be exempted from statutory liability for any damage to equipment caused by nonobservance of the applicable safety instructions, even during the warranty period.

The warranty granted by Carl Zeiss Spectroscopy GmbH ensures the safety, reliability and performance of the device only if the pertaining safety instructions are observed.

The manufacturer guarantees that the device is free of material or manufacturing defects when delivered. Possible defects must be notified to us immediately and steps be taken to minimize damage. If notified of such a defect, the manufacturer is obligated to rectify it at his discretion, either by repairing the instrument or delivering an intact replacement.

No guarantee is provided for defects caused by natural wear (wearing parts in particular) and improper use.

The manufacturer shall not be liable for damage caused by faulty operation, negligence or any other tampering with the device, particularly the removal or replacement of device components, or the use of accessories from other manufacturers. Any such action shall lead to a forfeit of all warranty claims.

Apart from the work described in Section 7 "Maintenance", no inadmissible maintenance or repair work may be performed on the device. Repairs may be performed only by employees of ZEISS Service or by persons authorized by ZEISS.

Contact the Customer Service Dept. of Carl Zeiss Spectroscopy GmbH (service.spectroscopy@zeiss.com) if any defects or faults occur on the device or individual components.

The **Corona process** should be inspected by the Customer Service Dept. of Carl Zeiss Spectroscopy GmbH at least once a year to ensure optimal and safe operation of the system.



Note

For details concerning the warranty, please refer to the **General Terms and Conditions of Carl Zeiss Spectroscopy GmbH**, which can be found on the internet at "http://www.zeiss.com/corporate/en_de/legal-information/company-information.html".

3 Device description

3.1 Scope of supply

The basic equipment of the standard version of the **Corona process** contains the following components:

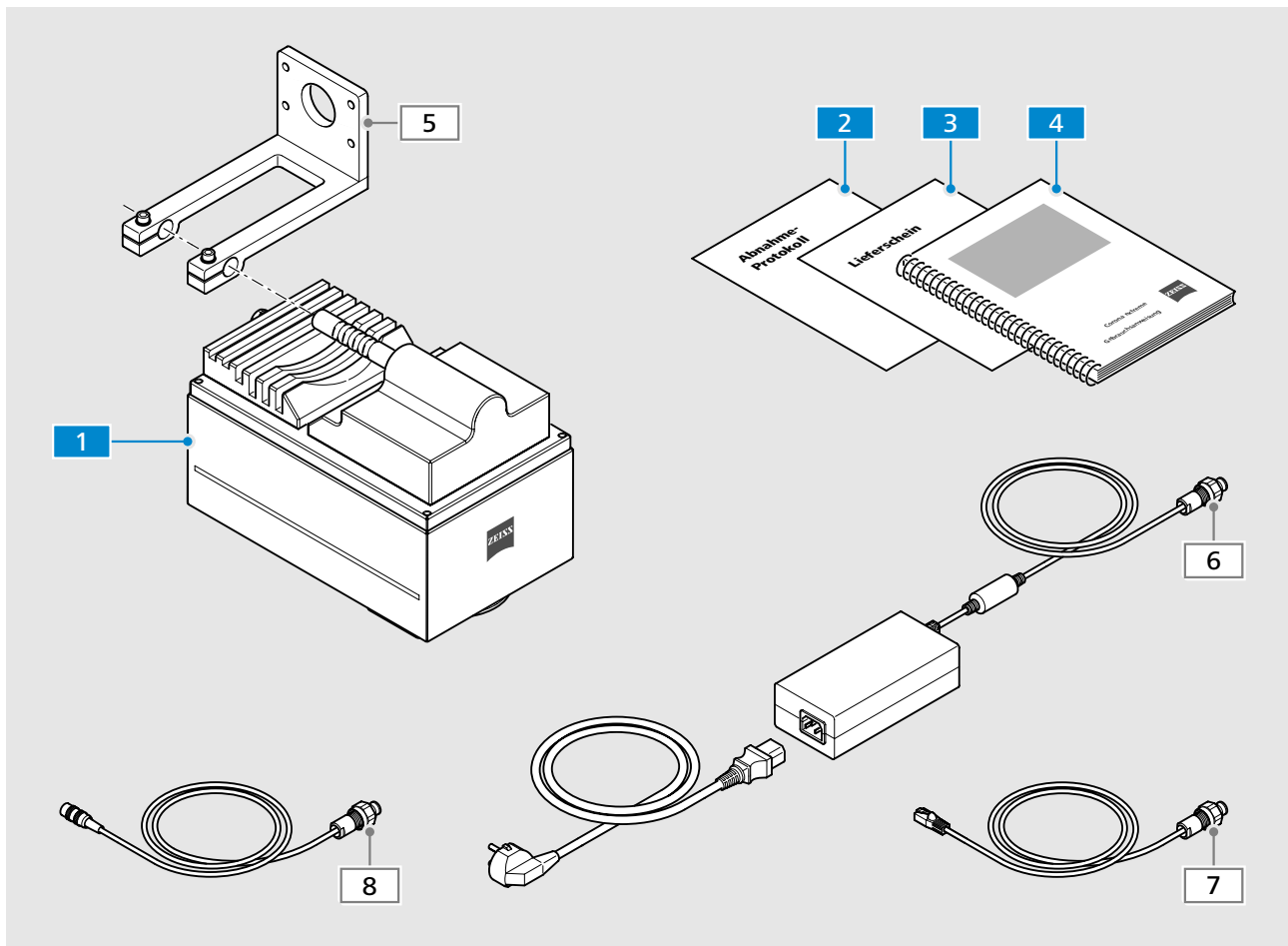


Fig. 1 Scope of supply

- 1** *Corona process spectrometer*
- 2** *Acceptance report*
- 3** *Delivery note and other documents accompanying the device*
- 4** *Set of documents (User Manual and other applicable documents)*

*Optional accessories:
(always compare with delivery note)*

- 5** *Mounting device (see Section 7.4 "Accessories and spare parts" on page 55)*
- 6** *Power supply cable*
- 7** *Ethernet cable*
- 8** *Digital IN/OUT cable*

3.2 Technical design

3.2.1 Functional elements

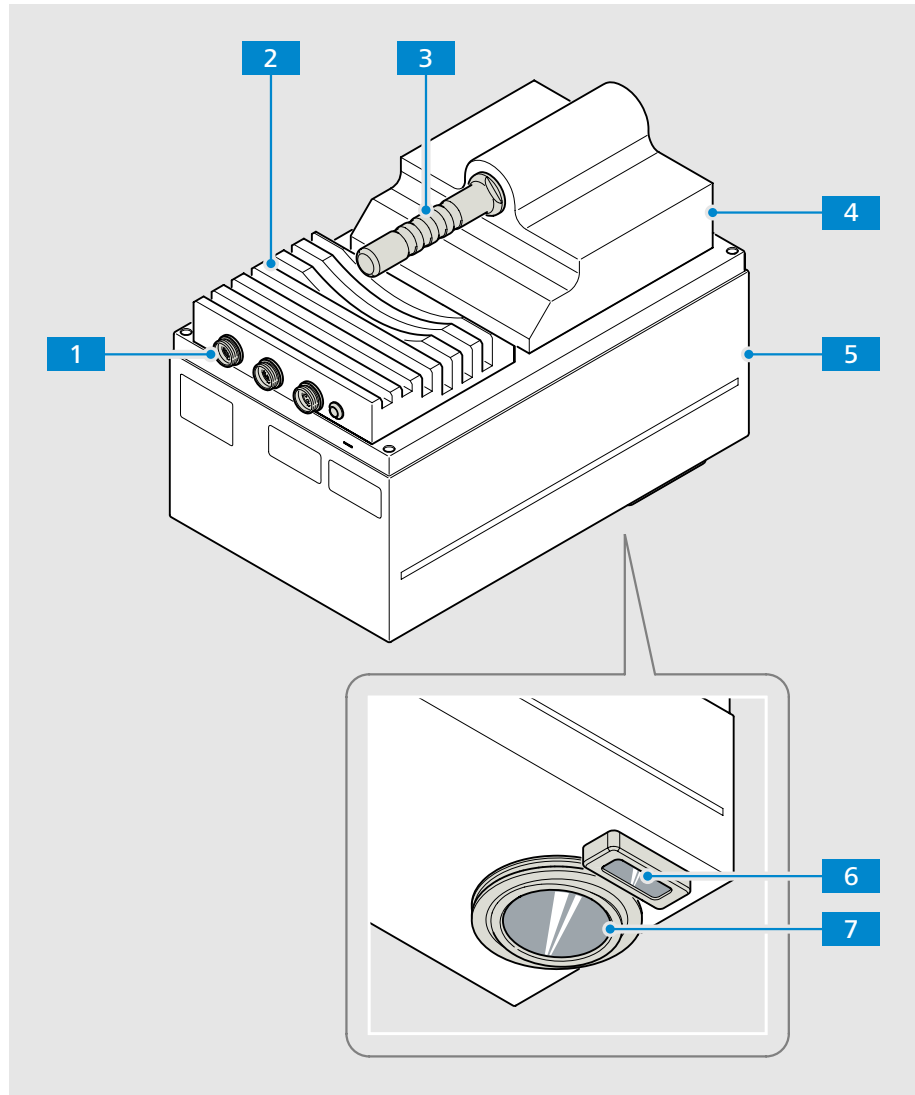


Fig. 2 Functional elements

- 1** Connection panel (Ethernet, Digital IN/OUT, power supply) and status display
- 2** Cooling element
- 3** Carrying handle and mounting interface
- 4** Device base (carrier for the measuring optics, the electronics and the connection panel)
- 5** Device cover
- 6** Distance sensor
- 7** Measuring window

3.2.2 Controls and indicators

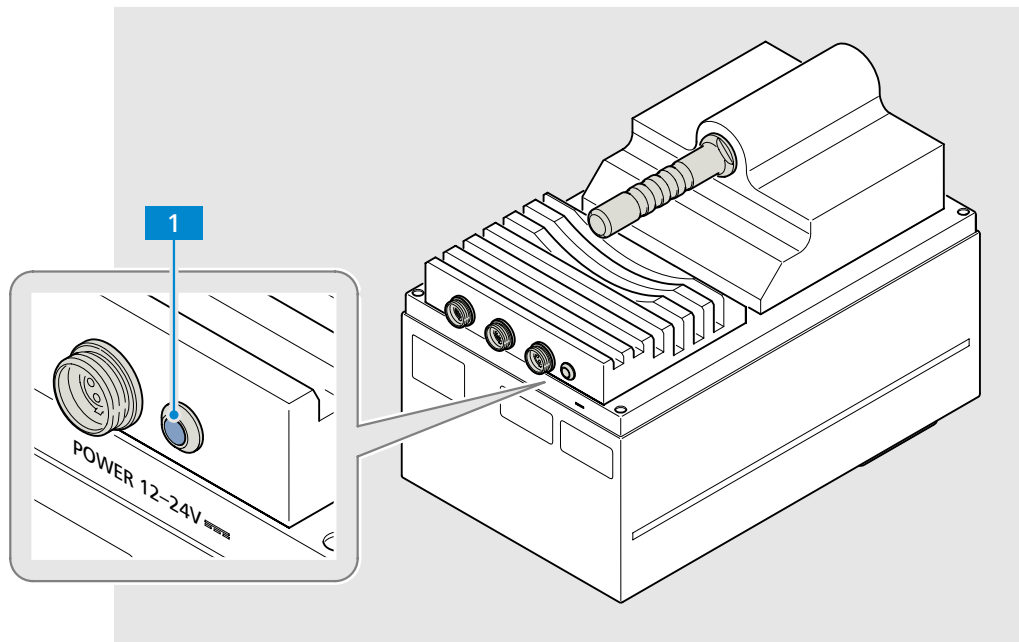


Fig. 3 Controls and indicators

1 Status LED

LED signal color	Description
flashing blue	after connection to the power supply
not lit	during initialization (max. 30 s) (no light beam visible in measuring window)
flashing blue	after complete initialization (no light beam visible in measuring window)

Tab. 1 LED status displays

Note



The light beam is visible only following initialization by the InProcess or Aspect software.

3.2.3 Electrical connections

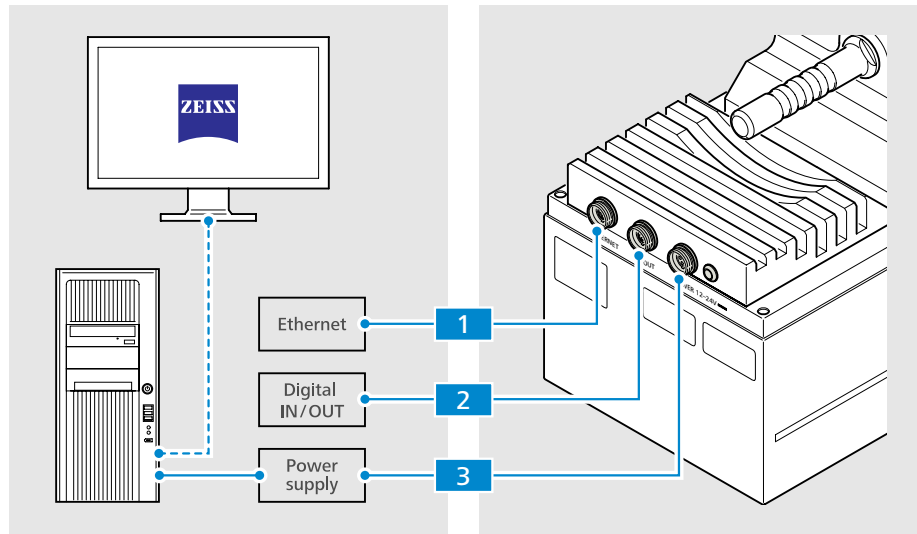


Fig. 4 Electrical connections



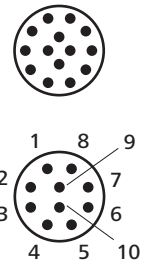
Ethernet cable FVG-2 W

- 1** "ETHERNET" connection –
14-pin socket



Lemo connector FVG-2 W

- 2** "Digital IN OUT" connection –
10-pin socket

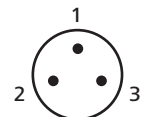


PIN	Color	Assignment
1	bk/wh	OUT 3
2	violet	IN 0
3	brown	OUT 2
4	white	IN 1
5	green	OUT 1
6	yellow	IN 2
7	gray	OUT 0
8	pink	IN 3
9	blue	GND
10	red	GND



Lemo connector FVG-2 W

- 3** "12–24 V DC POWER" connection (power supply) –
3-pin socket



PIN	Wire number	Assignment
1	1	12–24 V DC
2	2	GND
3	–	n. k.

3.2.4 Mechanical interface

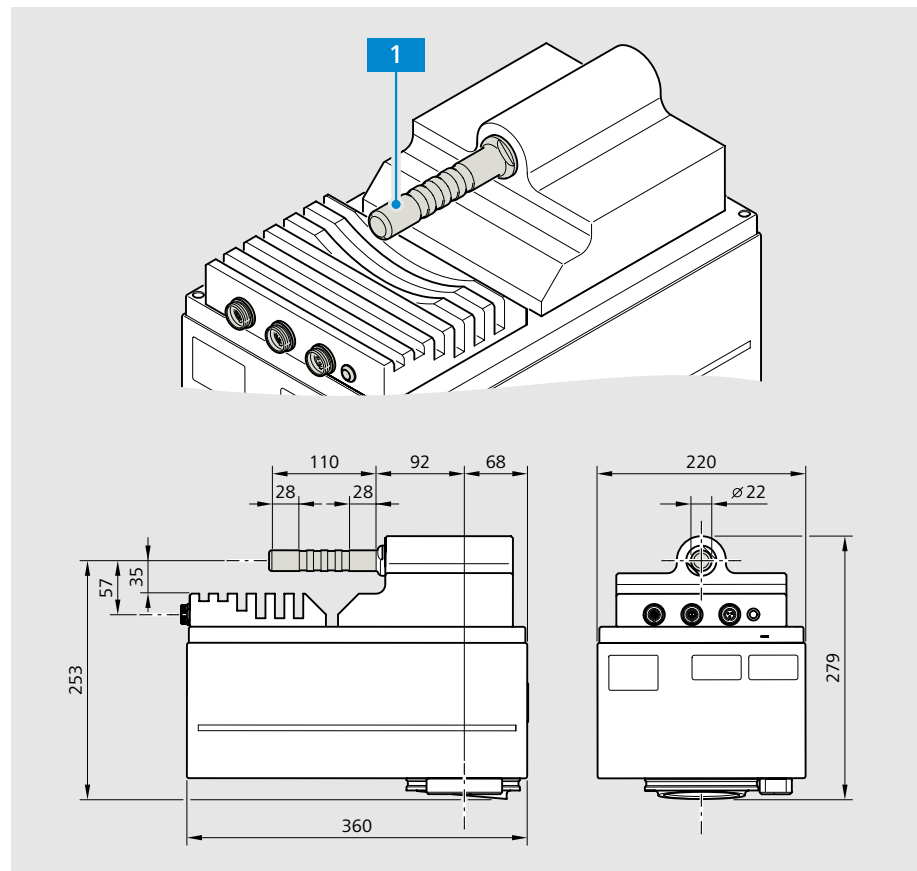


Fig. 5 Mechanical interface

1 Mounting interface – Arbor with $D = 22$ mm and length = 110 mm

Variant 1: Fastening of the **Corona process** with optional mounting device (in mounting package 000000-2107-066) from Carl Zeiss Spectroscopy GmbH (see also Section 4).

Variant 2: Fastening of the **Corona process** via a customer-installed mounting device. The connection dimensions are specified in the above Fig. 5 "Mechanical interface".

Note



For detailed information on mounting the Corona process on a customer interface, refer to Section 4 "Installing the measuring system" on page 21.

3.3 Functional description

The **Corona process** is a measuring system which is used to determine the ingredients and color of solid and pasty organic materials. It features two spectrometers which enable the wavelength range of 380–1650 nm. Internal referencing ensures consistently reproducible and reliable results.

The optical design enables installation of the **Corona process** directly above a conveyor belt or other open conveyor systems. At the same time, the sample can pass by the **Corona process** at a measuring distance of 90 to 600 mm.

The **Corona process** is equipped with two redundant halogen lamps and automatically switches over to the second lamp if the first one fails.

The stainless steel housing and the hygiene standard adhered to the design allow the use of the device in the food industry.

The **Corona process** features a mounting option for installing it on open transport systems, e.g. above conveyor belts.

The **Corona process** is operated at 12–24 V SELV/PELV and may be connected only to the intended power supply (safety extra-low voltage).

It has a voltage input which is connected to a 12-24 V DC power supply (40 W power supply unit/inrush current < 4 A).

The **Corona process** can be connected to a computer via an Ethernet interface to perform measurements, calculations and displays of ingredients.

Furthermore, the **Corona process** offers the possibility of utilizing 4 digital inputs and 4 digital outputs.

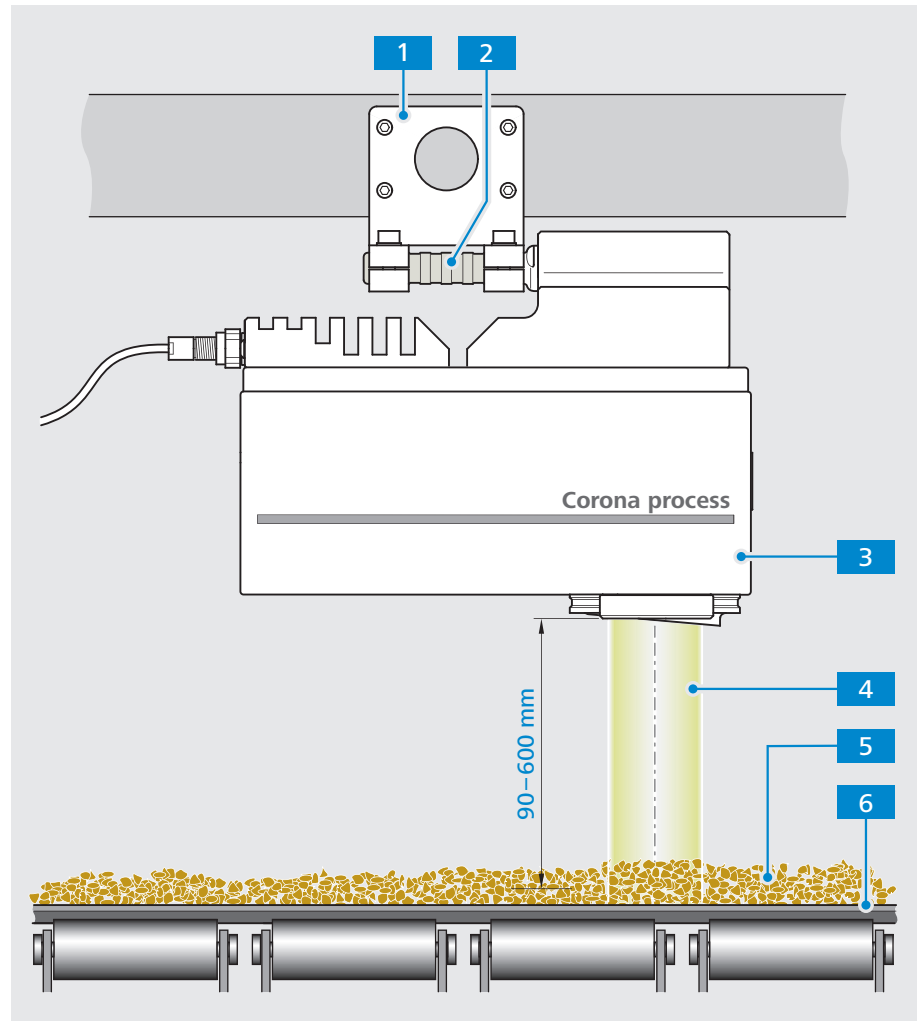


Fig. 6 Functional description

- 1** Mounting device (in mounting package 000000-2107-066) or customer-installed mechanical interface
- 2** Mounting interface (handle)
- 3** **Corona process** measuring system
- 4** Lighting and measuring beam
- 5** Sample material
- 6** Conveyor belt (example)

3.4 Software

3.4.1 ZEISS InProcess

The ZEISS **InProcess** software included in the scope of supply is required to control the **Corona process** measuring system and process the generated measurement data.



Note

For details on installation, setup and use of the software, see Section 4.4 or refer to the "InProcess Manual" included in the scope of supply.

The software manual is available on the attached CD.

The **Corona process** measuring system is approved for use with the following software packages:

- InProcess
- Aspect Plus

The **OSIS SDK** Software Development Kit (000000-2101-333) is available for developing your own software.

3.4.2 IP addresses

Corona process measuring systems are delivered with predefined IP addresses. The following standard IP addresses are to be used:

- Corona process: 192.168.0.177

If several **Corona process** measuring systems are operated in a device group with a single PC, each system must have its own IP address. In this case, the IP address must be changed.

4 Installing the measuring system

4.1 Preparing the installation

- Procedure**
- 1 Compare the delivery documents with the system components actually supplied to you.
 - 2 Check all system components for external intactness.
 - 3 Check the existing environmental and connection conditions. The following values must be observed:

Supply voltage	12–24 V \equiv SELV (safety extra low voltage)
Power consumption	40 W
Inrush current	< 4 A
Operating temperature	–10 to +50 °C
Storage/transport temperature	–40 to +70 °C
Max. humidity	95 % non-condensing
Altitude of operation	Up to 2000 m

Tab. 2 Connection and environmental conditions

- 4 If you do not use the original mounting device from Carl Zeiss Spectroscopy GmbH (000000-2107-066), make sure that the customer-installed mechanical interface has the dimensions required to mount the **Corona process**.

The device must be stable enough to support the weight of the **Corona process** (15 kg) vibration-free.

Note



The exact connection dimensions are specified in Section 3.2.4 “Mechanical interface” on page 17.

- 5 Make sure that all cables can be laid so that they are protected and free of mechanical and thermal loads.

4.2 Installing the Corona process

The **Corona process** is mounted on a customer interface according to customer-specific requirements.

The example described below is explained based on the mounting option with the original mounting device (included in mounting package 000000-2107-066) from Carl Zeiss Spectroscopy GmbH.

- Requirements**
- Prepared customer-installed mechanical interface with four M8 threaded holes or four through holes with a diameter of 9 mm for fastening the mounting device.

For the connection dimensions of the mounting device, please refer to the illustration below.

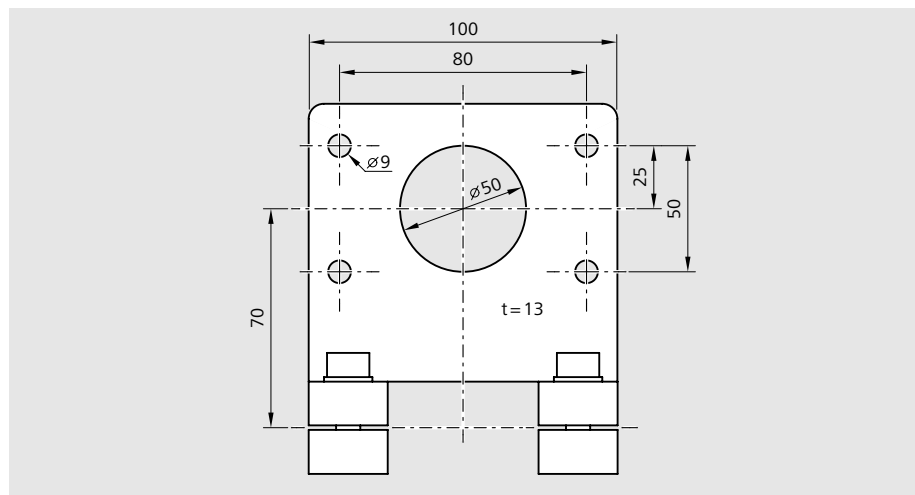


Fig. 7 Connection dimensions of the mounting device

- Four M8 fastening screws for attaching the mounting device to the customer interface in the length required on-site and with suitable retaining elements for the fastening screws (e.g. toothed lock washers)
- Tools depending on the type of screw (not included in the scope of supply), e.g.:
 - Open-end wrench, 13 mm A/F
 - Allen key, 6 mm A/F
 - Screwdriver, TX25

Note



For optimal use of the Corona process, we recommend installing the measuring system so that the sample material is transported past the distance sensor first and then past the measuring window.

- Procedure**
- 1 Screw the mounting device **2** using four screws (M8) **3** onto the customer-installed mechanical interface **1**.
 - 2 Loosen both clamping screws **6** on the location holes **4** of the mounting device.
 - 3 Insert the **Corona process** with the carrying handle **5** in the location holes **4** of the mounting device. At the same time, note the transport direction of the sample material (see note).
 - 4 Align the **Corona process** properly to the measurement object.
 - 5 Tighten both clamping screws **6** securely.

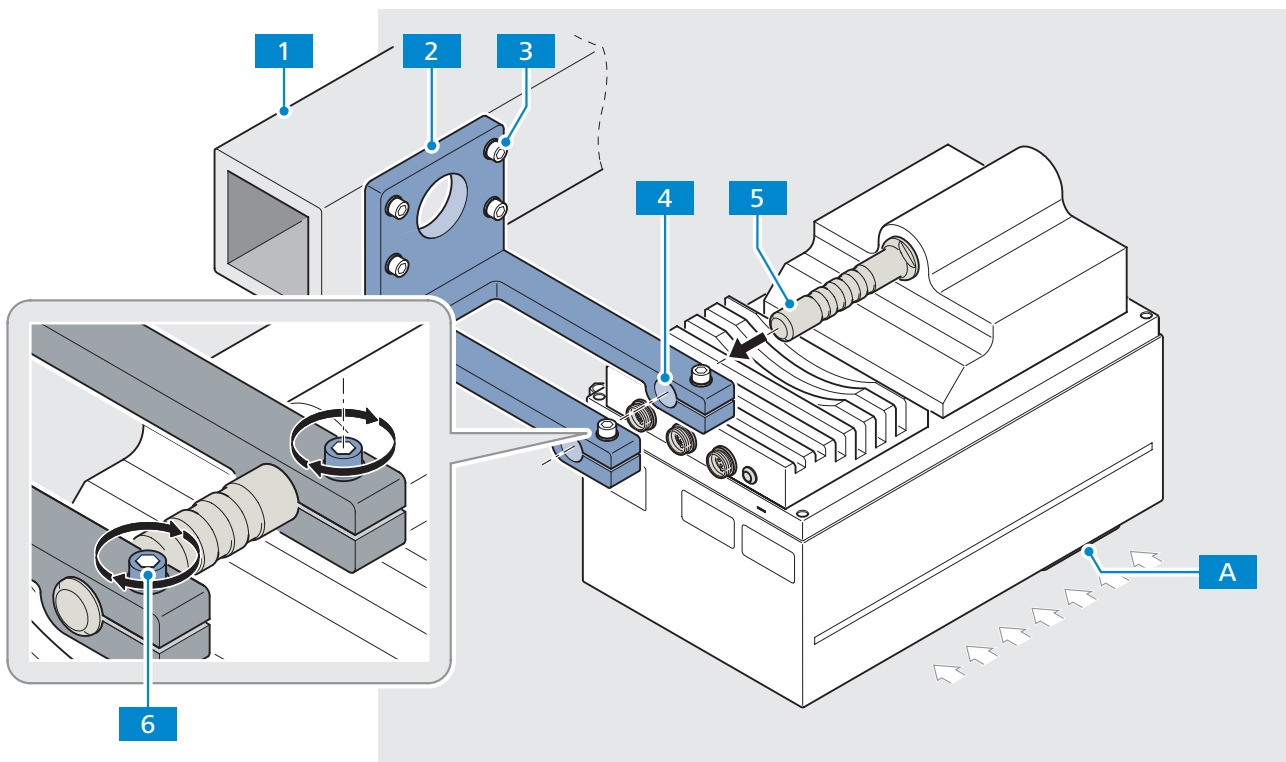


Fig. 8 Fastening the mounting device and the Corona process

- 1** Customer-installed mechanical interface
- 2** Mounting device (in mounting package 000000-2107-066)
- 3** 4x M8 screws (in length required on-site) with suitable retaining elements
- 4** Location holes (slotted)
- 5** Carrying handle/mounting interface
- 6** 2x clamping screws
- A** Distance sensor (see also „Fig. 2 Functional elements“ on page 14)

4.3 Connecting system components

Warning



ELECTRICAL ENERGY HAZARD

Make sure that the power supply is disconnected.
The entire measuring system must be switched free of voltage.

Requirements

- Use only original parts supplied by Carl Zeiss Spectroscopy GmbH (see Section 7.4 "Accessories and spare parts" on page 55).
- Have the following tools ready:
 - Open-end wrench, 22 mm A/F (for the union nut on the connector or on the protective cap)

Procedure

- 1 Use the Ethernet cable **1** to connect the **Corona process** with your computer.

Note



The length of the Ethernet cable must be less than 100 m (max. 80 m is recommended) or a switch must be interposed.

To prevent communication problems, the use of a second network card for the **Corona process** is recommended.

- 2 If required, you can connect up to four digital inputs/outputs via the "Digital IN OUT" port.
First remove the protective cap **2.1** from the "Digital IN OUT" port.
Then connect the Digital-IN/OUT cable **2**.
- 3 Use the power supply cable **3** to make a connection between the **Corona process** and a safety extra-low voltage source of 12–24 V DC (power consumption = 40 W, inrush current < 4 A).

Note



The minimum diameter is AWG 16 for a cable length of 15 m.

With a voltage of 12 V DC, we recommend a max. length of 3 m (for accessories, see Section 7.4 "Accessories and spare parts" on page 55).

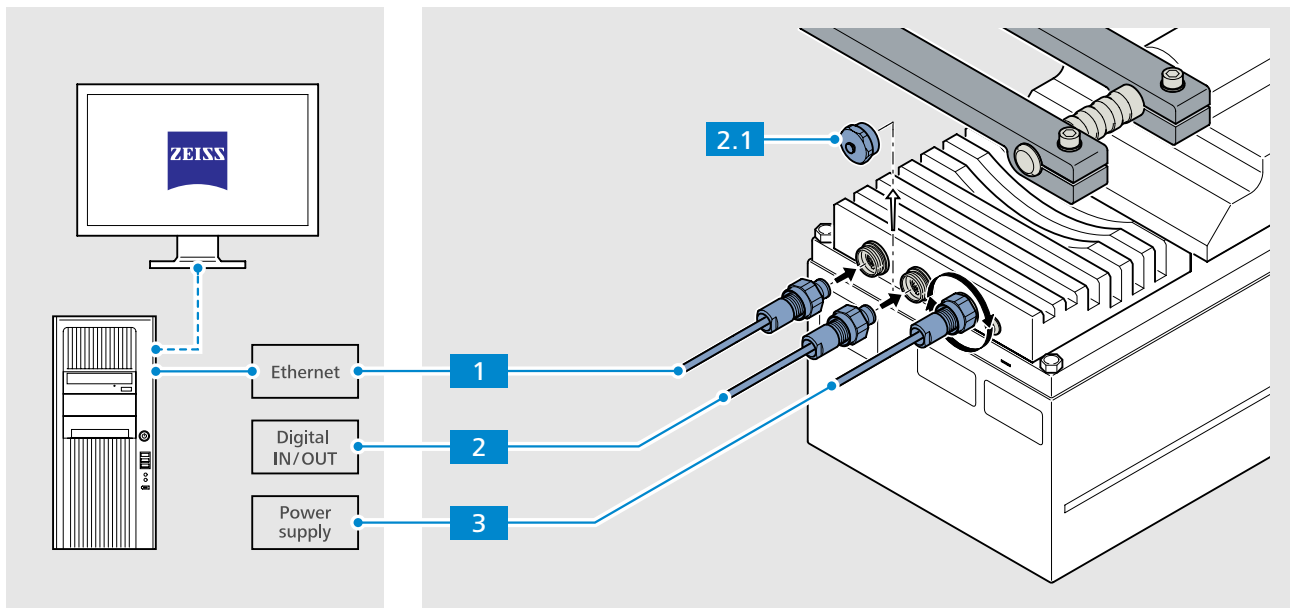


Fig. 9 Connecting system components

- 1** "ETHERNET" connection
- 2** "Digital IN OUT" connection
- 2.1** Protective cap (only for "Digital IN OUT" connection)
- 3** "POWER 12–24 V DC" connection (power supply)

4.4 Software installation

4.4.1 Installing the InProcess software

All of the files required for installation and the configuration file are included on the CD-ROM for InProcess Software.

- Procedure**
- 1 Start the installation process by double-clicking on the **setup.exe** file.
 - 2 Select the storage location and agree to the licensing terms.
 - 3 Then click on **INSTALL** to start the installation process.

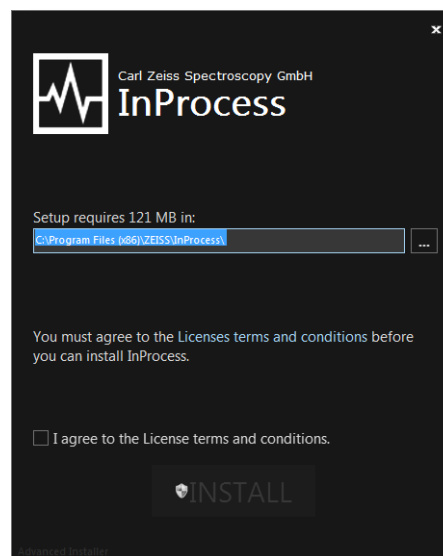


Fig. 10 Selecting the storage location and agreeing to the licensing terms

- 4 End the installation process by clicking on the **Finish** button.

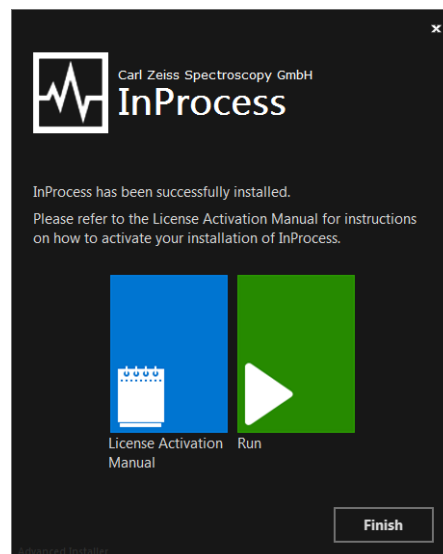


Fig. 11 Completing the installation

4.4.2 Activating licenses

After completing the installation of the InProcess software, you still must activate the required licenses.

Note



For details on activation of the required licenses, please refer to the "ZEISS License Activation Manual".

As soon as you have activated the licenses, the software can be started.

Note



For details on the configuration and operation of the software, please refer to the "InProcess Manual".

5 System Operation

- Requirements**
- The components of the **Corona process** measurement system are completely and properly installed and connected.
 - The required software packages are installed and the licenses are activated.

- Procedure**
- 1 Establish the power supply for the **Corona process** measurement system.
 - 2 Check the display of the Status LED on the **Corona process**.
When the **Corona process** measurement system has booted up completely, the Status LED flashes **blue** in one second intervals.

blue flashing	after connection to the power supply
not illuminated	during initialization (max. 30 s) (no light beam is visible in the measurement window)
blue flashing	after complete boot-up (no light beam is visible in the measurement window)

- 3 Turn on your computer and start the **InProcess** software.
- 4 Select the service of the appropriate device (**Corona process**).

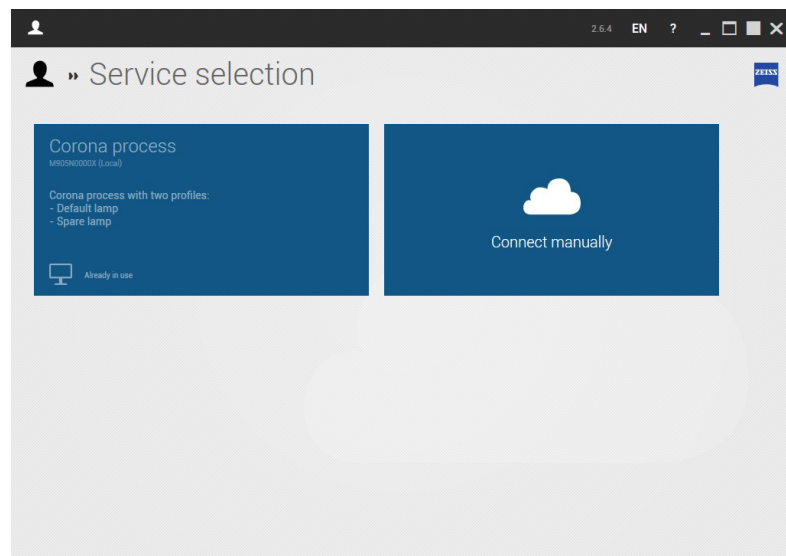


Fig. 12 Select service

Note



To permanently select a service (so that this selection window will no longer appear), press the right mouse button and select the desired service as the default value.



Note

Please make sure that you have set the correct device profile. The “Corona process default lamp” is set as the default profile.

For details on changing the profile, refer to the technical description “Information on the device profiles of the Corona extreme and Corona process”.

- 5 To start the product configuration, click on the **Product setup** button after the start screen appears.

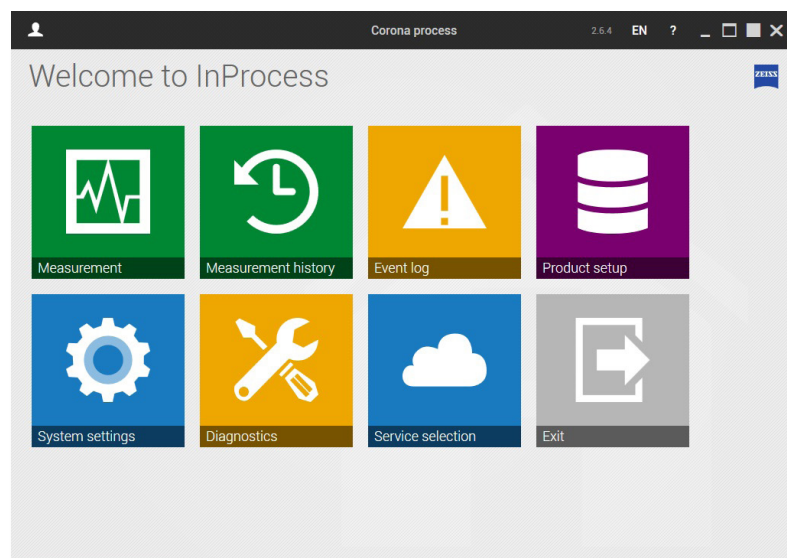


Fig. 13 Select product configuration

- 6 You can add a new product and assign a product name to it by clicking on +.
- 7 Then select **Continuous measurement**.

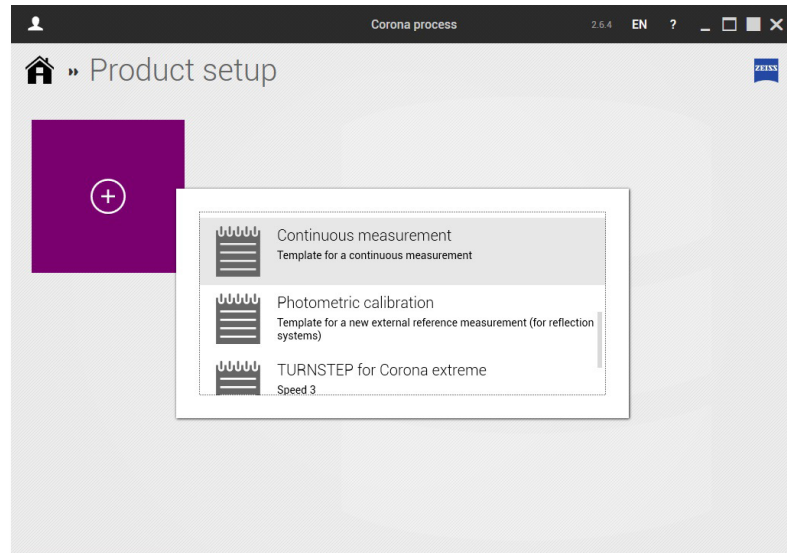


Fig. 14 Select continuous measurement

- 8 Save the product. To do this, click on the **Save** button.

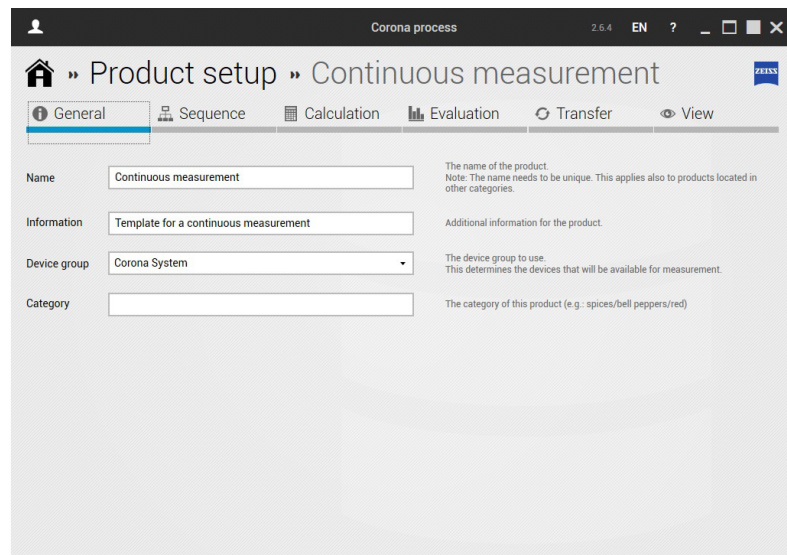


Fig. 15 Save product

Note



For details on product adaptation, refer to the software description "InProcess Manual".

- 9 Return to the start screen by clicking on the **Home** button.
- 10 Click on the **Measurement** button.
- 11 Start a measurement by clicking on the button for the desired product.

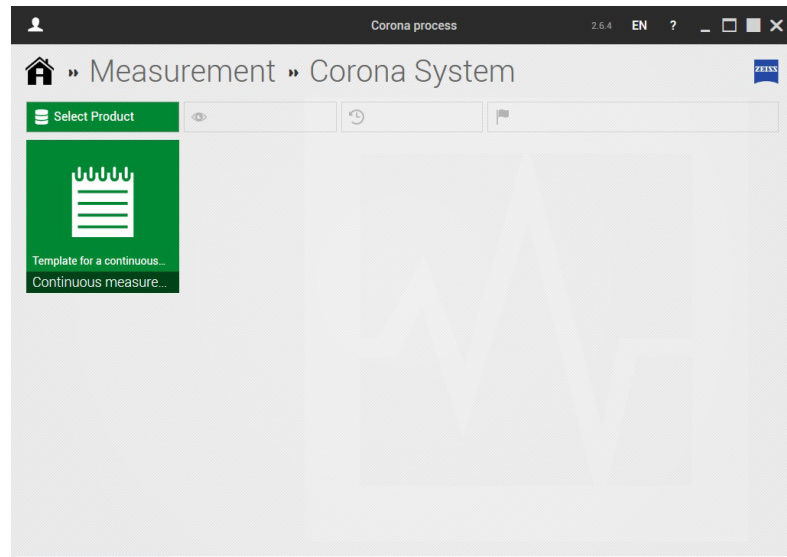


Fig. 16 Start measurement

6 Help in case of faults

In case of malfunctions of any kind, consult the diagnostic tool of **InProcess**. Send the corresponding information to our Service Department (service.spectroscopy@zeiss.com).

If the connection to **InProcess** is not available, perform a ping test on the system. Communicate the results of this test to our Service Department.

Error	Cause	Remedy
Communication interrupted	<ul style="list-style-type: none"> ■ Damaged Ethernet cable ■ False IP settings ■ Interference caused by surrounding networks ■ Unstable power supply 	<ul style="list-style-type: none"> ■ Check Ethernet cable ■ Check IP settings ■ Use separate network (no company network) ■ Check grounding, replace power supply
No illumination light beam present	<ul style="list-style-type: none"> ■ Lamp is off ■ Defective lamp ■ Motor doesn't respond 	<ul style="list-style-type: none"> ■ Check whether the measuring system is initialized via the software, check the status LED and the power supply ■ Change to the spare lamp and replace the default lamp if necessary (only by instructed personnel) ■ Switch measuring system off and on/Restart software
Signal strength too weak	<ul style="list-style-type: none"> ■ Distance between sample and measuring system too great ■ Protective window dirty ■ Motor doesn't respond ■ Lamp has reached the end of its life 	<ul style="list-style-type: none"> ■ Optimize measuring distance ■ Clean protective window, use air flushing if necessary ■ Switch measuring system off and on, restart software ■ Change to the spare lamp and replace the default lamp if necessary (only by instructed personnel)
Signal too high	<ul style="list-style-type: none"> ■ Sample reflects too strongly 	<ul style="list-style-type: none"> ■ Install measuring system at a slight angle to the sample
Repeatability of measured values too poor	<ul style="list-style-type: none"> ■ Signal-to-noise ratio too low ■ Measuring time too long 	<ul style="list-style-type: none"> ■ Optimization or adaptation of integration time ■ See fluctuating measured values
Fluctuating measured values	<ul style="list-style-type: none"> ■ Fluctuations of ambient temperature and humidity ■ Halogen lamp has reached end of life 	<ul style="list-style-type: none"> ■ Performance of a regular internal referencing ■ Change to the spare lamp and replace the default lamp if necessary (only by instructed personnel)

Error	Cause	Remedy
Other errors, questions and maintenance work		■ Contact customer service

7 Maintenance

Note



In order to ensure optimal settings and smooth operation of your measuring system on a long-term basis, we recommend concluding a service and maintenance contract with ZEISS.

Please get in touch with your local ZEISS representative when ordering spare parts or if service is required.

7.1 Cleaning and care

Warning



ELECTRICAL ENERGY HAZARD

Disconnect the Corona process measuring system from the power supply completely before starting to clean it.

Caution



THERMAL ENERGY HAZARD

Let the Corona process measuring system cool down for at least 10 minutes before starting to clean it.

Follow the safety instructions for handling inflammable liquids and solvents on the respective packages.

Requirements

- The **InProcess** control software has been shut down.
- The power supply to the **Corona process** measuring system is completely disconnected.

Procedure

- 1 Clean the surface of the device with common solvent-free cleaning agents. Persistent contamination can be removed cautiously with a detergent solution or ethyl alcohol.
- 2 Clean the protective glass of the measuring system using a soft, lint-free cloth moistened with distilled water or a special optical cleaner.

7.2 Changing halogen lamps

Warning



ELECTRICAL ENERGY HAZARD

Make sure that the power supply is disconnected – the entire measuring system must be switched free of voltage.

Protect the measuring system against unintentional activation of the power supply by third parties.

Caution



GENERAL RISK

All specified activities may be performed only by Service staff of Carl Zeiss Spectroscopy GmbH or by properly instructed personnel.

Caution



THERMAL ENERGY HAZARD

Let the halogen lamp to be replaced cool off for approx. 10 minutes before removing it.

Caution



SENSITIVE OPTICAL COMPONENTS

Perform work on optical components only in a very clean working environment.

Be careful not to touch the glass bulb of the new halogen lamp without putting on cotton gloves first.

- Requirements**
- Shut down the control software and disconnect the power supply to the **Corona process** measuring system.
 - Perform the activities described below at an ESD workplace.
 - Have the following spare parts ready:
 - Spare lamps, order no. 000000-2219-967

Note



Always replace both halogen lamps together if possible.

- Have the following tools and accessories ready:
 - The tools belonging to the calibration device for the **Corona process**
 - Phillips screwdriver PH2 (for older device versions)
 - Open-end wrench, 8 mm A/F
 - Screwdrivers, TX10 and TX25
- Additionally required tools and accessories:
 - Open-end wrench, 22 mm A/F
 - Allen key, 6 mm A/F
 - Cotton gloves

Procedure 1 Removing the system cable

Loosen the union nuts of the connected plugs by hand (or with a 22 mm open-end wrench) and pull the cables out of the connecting sockets on the measuring system.

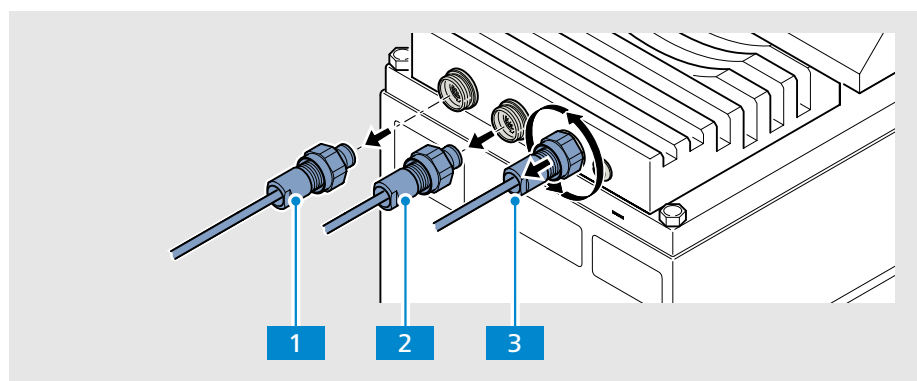


Fig. 17 Removing the system cables

- 1 "ETHERNET" connection
- 2 "Digital IN OUT" connection
- 3 "POWER 12–24 V DC" connection (power supply)

2 Removing the Corona process from the mounting device

Loosen both clamping screws **1** on the mounting device using a 6 mm Allen screw.

Pull the Corona process **2** out of the mounting device.

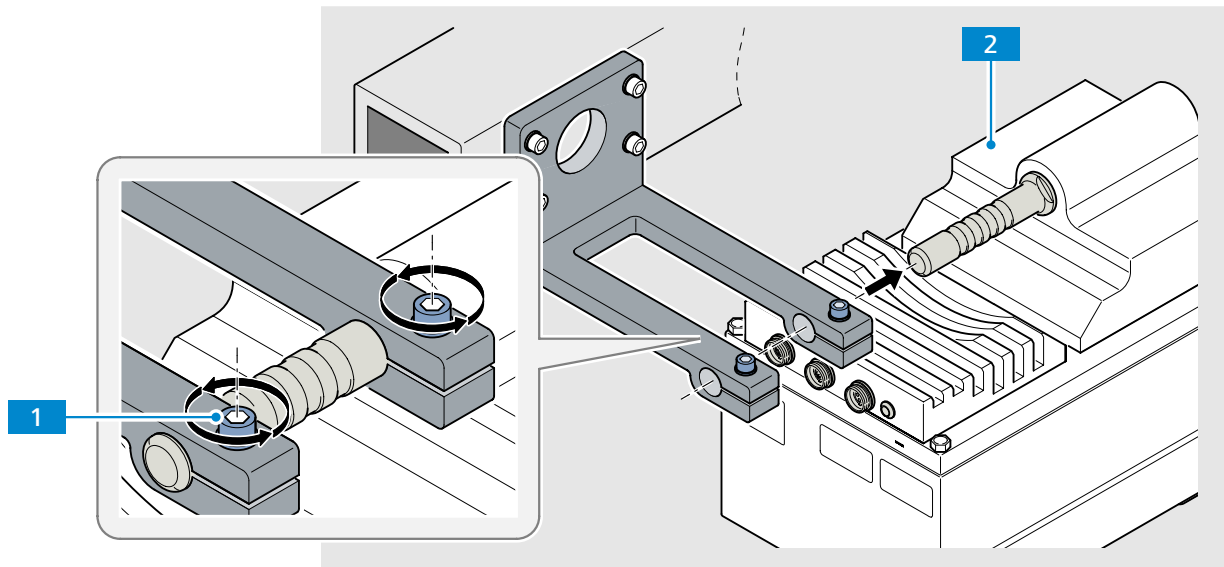


Fig. 18 Removing the Corona process from the mounting device

3 Removing the base of the device from the device cover

Unscrew and remove the four hexagon screws **1** from the housing with an 8 mm open-end wrench. (Phillips screws may be installed in older device versions. Loosen Phillips screws with a PH2 Phillips screwdriver.)

Carefully lift the base of the device **2** by the carrying handle **3** out of the device cover **4**. Make sure that you do not feel any resistance while doing so.

Turn the base of the device upside down (180°). The interior assemblies are now located face up and the carrying handle is located face down. Carefully deposit the base on an ESD workplace.

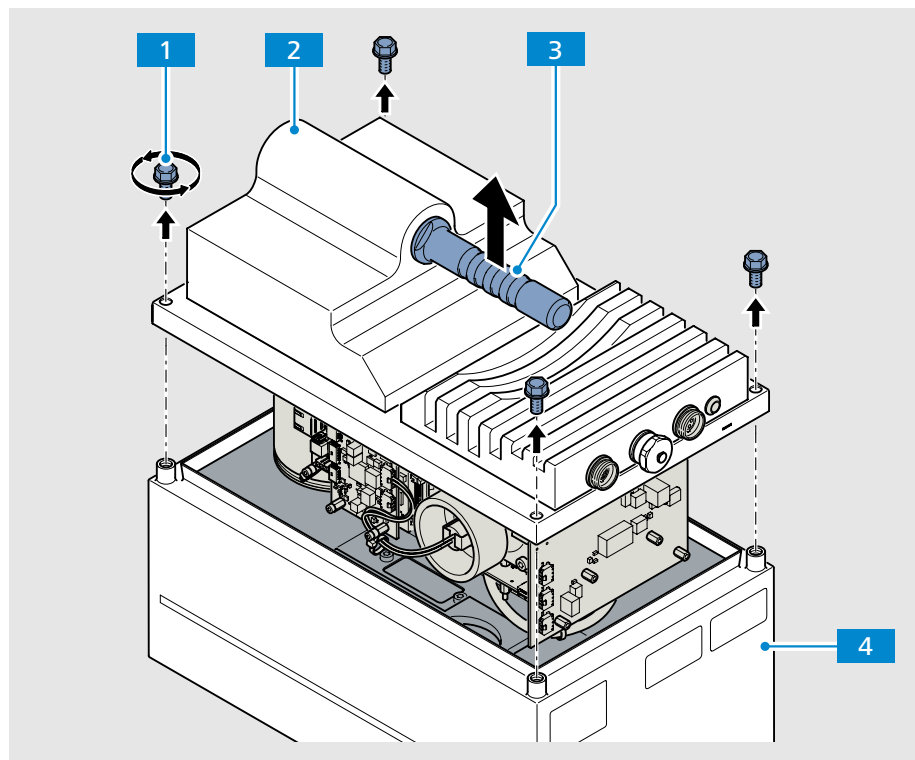


Fig. 19 Removing the base of the device from the device cover

4 Finding the right lamp

When viewing the base of the device from the direction of the connector panel, the default lamp **L1** is located on the left side of the device base and the spare lamp **L2** is on the right side. The corresponding labeling also is affixed to the lamp base.

Note



The procedure for changing the default lamp is described below. The procedure for changing the spare lamp is the same.

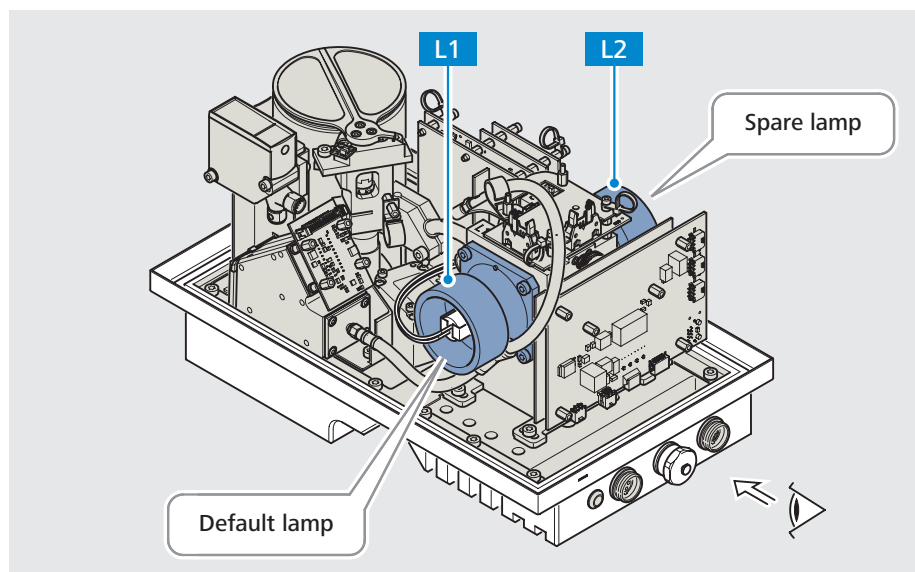


Fig. 20 Finding the right lamp

5 Disconnecting the lamp cable

Pull the lamp cable **1** off of the lamp base.

Lay the lamp cable aside in such a way that it will not obstruct further work steps or be damaged.

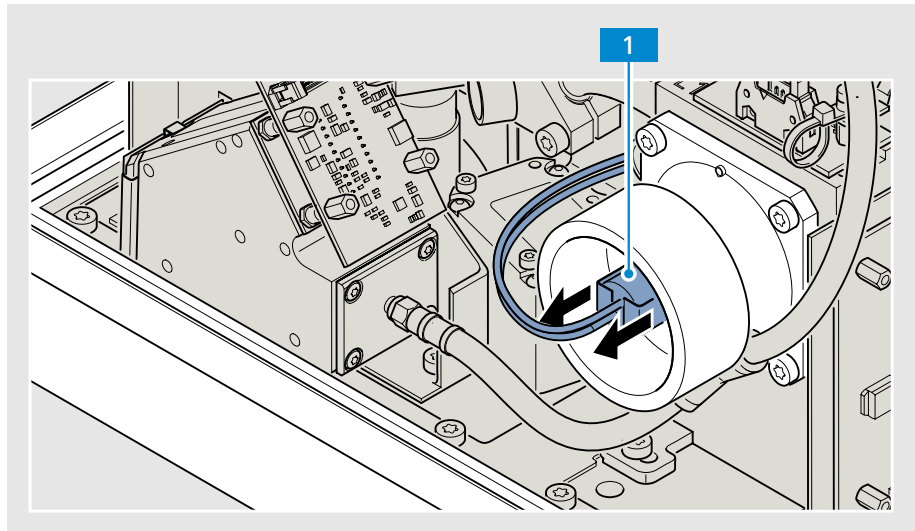


Fig. 21 Disconnecting the lamp cable

6 Unscrewing the lamp holder

Unscrew three of the four screws **2** from the lamp base with a TX25 screwdriver **1**.

Before unscrewing the last screw, hold the lamp holder **3** securely to prevent inadvertent contact with the adjacent light guide **4**.

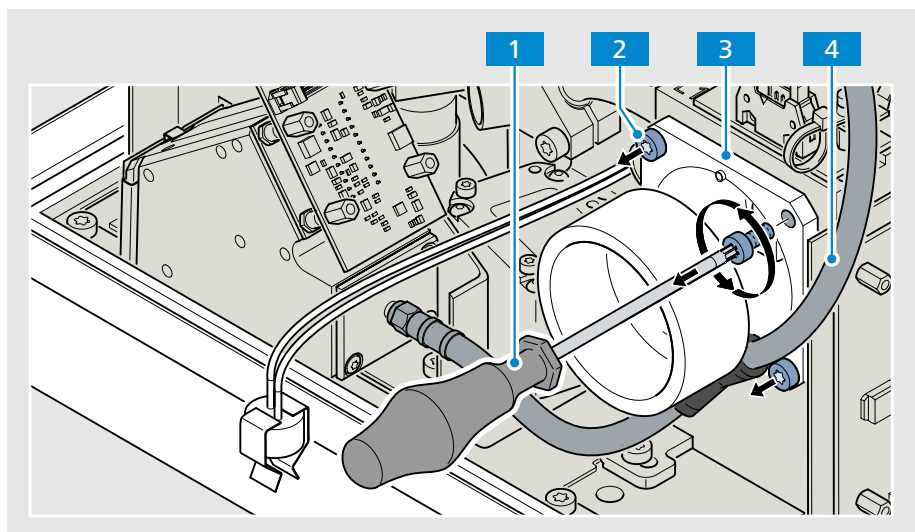


Fig. 22 Unscrewing the lamp holder

7 Removing the lamp holder

Carefully remove the lamp holder of the default lamp **1** upwards. At the same time, be careful not to touch the light guide **2** lying underneath it.

Note



Several cables run over the lamp holder of the spare lamp. Therefore, remove the lamp holder of the spare lamp by taking it out at the side.

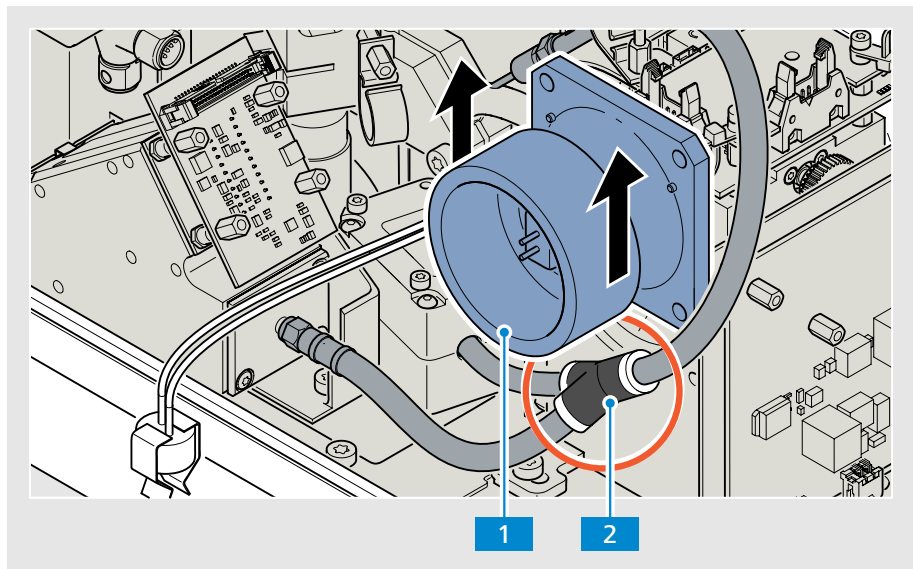


Fig. 23 Removing the lamp holder

8 Removing the old halogen lamp

Place the lamp holder **5** down on a flat surface (as shown in the following illustration).

Unscrew the three screws **1** from the lamp holder using a TX 10 screwdriver **2** and remove the clamping ring **3**.

Remove the old halogen lamp **4** from the lamp holder.

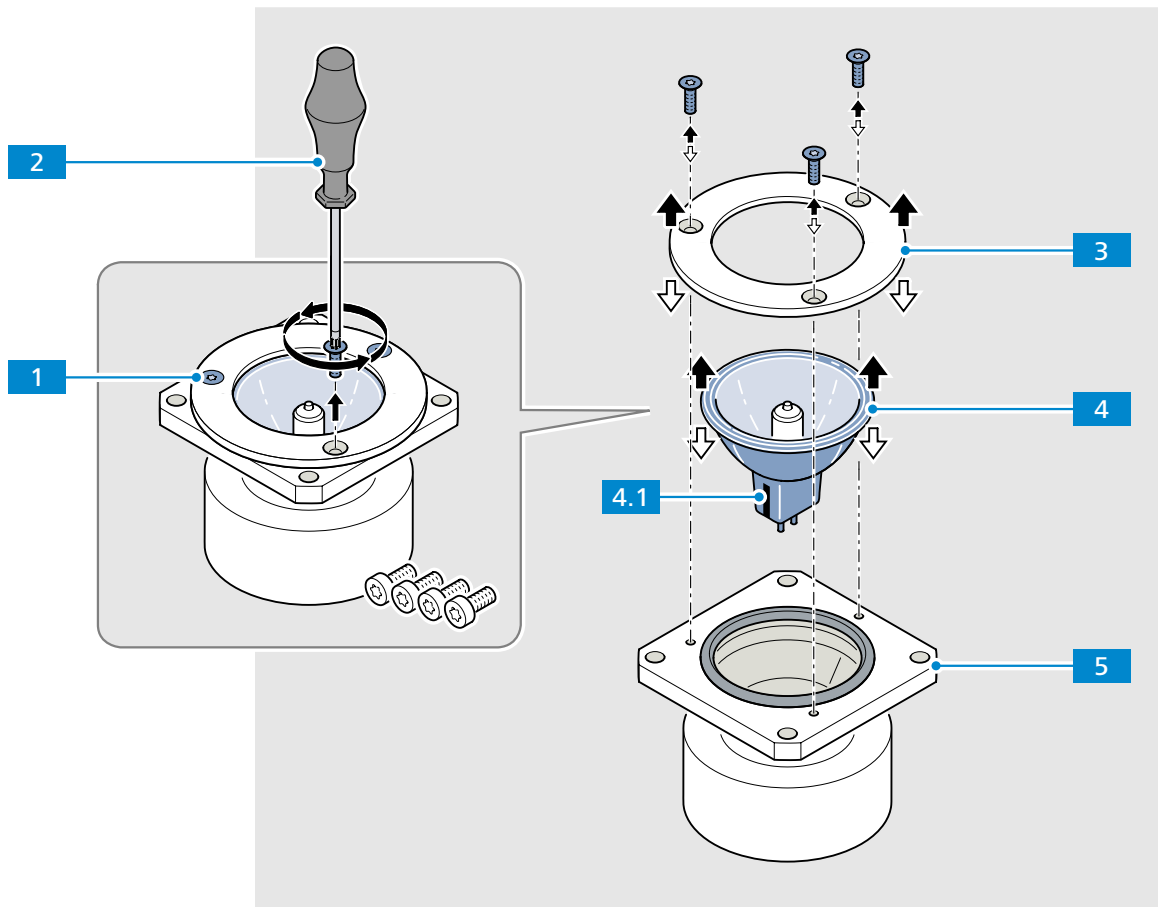


Fig. 24 Removing the old halogen lamp

9 Installing the new halogen lamp (see Fig. 24 – reverse order)

Put on the cotton gloves.

Insert the new halogen lamp **4** in the lamp holder **5**.

Align the new halogen lamp so that the black mark on the lamp socket **4.1** is pointing upwards in the mounting position.

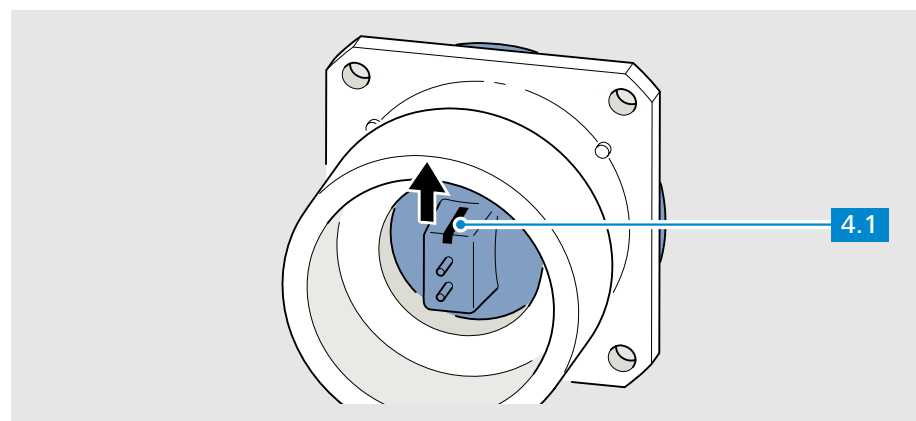


Fig. 25 Aligning the halogen lamp

Place the clamping ring **3** on top of the halogen lamp.

Screw the three screws **1** back into the lamp holder using a TX10 screwdriver **2**.

Tighten the clamping ring with the three screws until there is no longer any gap between the clamping ring and the lamp holder.

10 Reinstalling the lamp holder

Carefully position the lamp holder (see Fig. 23/ **1**) on the lamp base – being careful not to touch the light guide in the process (see Fig. 23/ **2**).

Make sure that the black mark on the lamp socket is pointing upwards (see Fig. 25/ **4.1**).

Screw the lamp holder back onto the base with the four screws (see Fig. 22/ **2**).

Plug the lamp cable (see Fig. 21/ **1**) back onto the lamp socket.

11 Inserting the device base in the device cover (see Fig. 19 – reverse order)

Carefully set down the device base **2** on the carrying handle **3** and into the device cover **4**.

Use the four hexagon screws **1** to screw the device base together with the device cover.

12 Calibrating compensation data

Both halogen lamps must be recalibrated after each lamp change (refer to section 7.3 “Lamp calibration”).

Final measures 13 Installing the Corona process

Perform work steps 3 to 5 from section 4.2 “Installing the Corona process” on page 22.

Perform work steps 1 to 3 from section 4.3 “Connecting system components” on page 24.

7.3 Lamp calibration

- Requirements**
- InProcess software V 2.7.0 is installed on your PC.
 - You have replaced both halogen lamps and the measuring system has been properly closed again.
 - Have the following tools and accessories ready
 - Corona process calibration bench, order no. 000000-2211-998
 - Scope of supply:
 - Calibration device
 - Certified white standard with appropriate certificate (attached CD)
 - Black standard
 - Tools for changing lamps
 - Corresponding instructions
 - Storage box
 - Ethernet cable, order no. 000000-2036-573
 - Lab power supply, order no. 000000-2045-548

Procedure 1 Calibration device setup

Fold open the calibration device.

Have the reference standard ready.

2 Preparing the measuring system for calibration

Mount the **Corona process** on the calibration device.

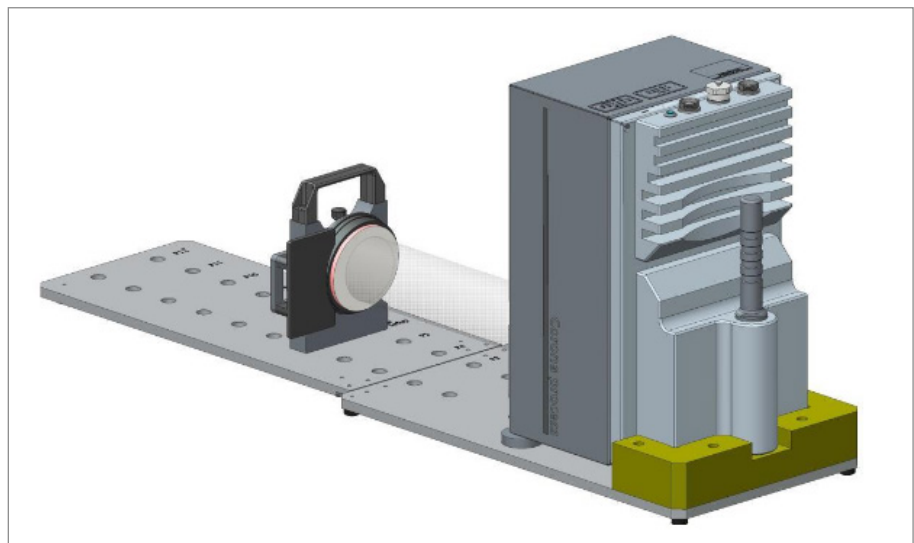


Fig. 26 Mounting the Corona process on the calibration device

Connect the Ethernet cable and the power supply cable to the measuring system.

Start the **OSISManagementConsole.exe** file under:
 ⇒ C:\Program Files (x86)\ZEISS\InProcess.

If the **Corona process** measuring system has not yet been configured, select it for configuration under the menu option **New**.

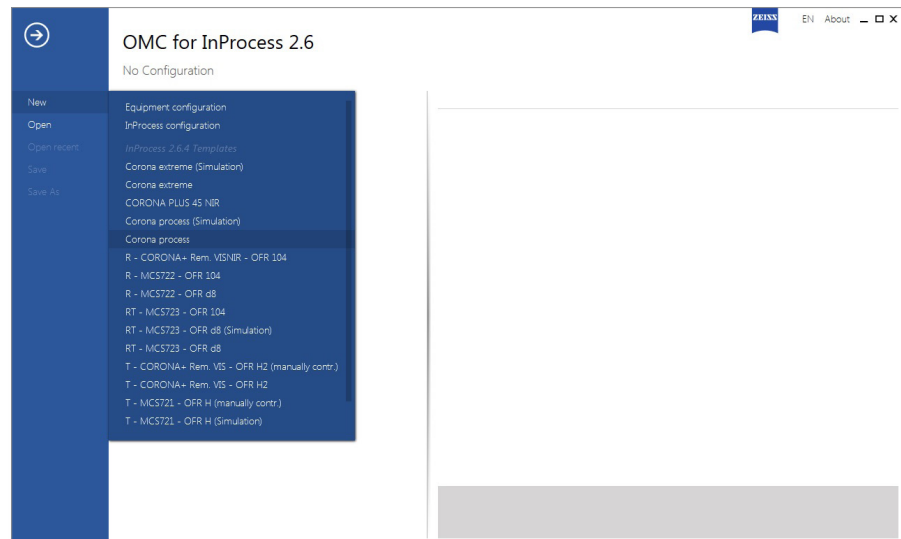


Fig. 27 Selecting a measuring system

3 Selecting the lamp to be calibrated

Right-click on **dev Corona process** and select **calibration of the default lamp** or **calibration of the spare lamp**.

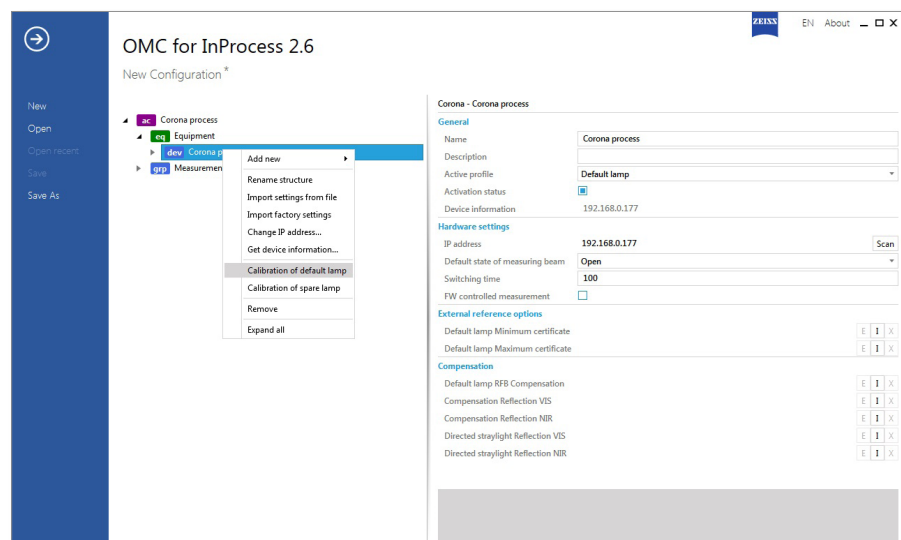


Fig. 28 Selecting a lamp

The initialization of the **Corona process** may take a few seconds.

Note

The program sequence must be performed completely for the default lamp and for the spare lamp.

4 Resetting the lamp counter

Reset the lamp counter by pressing the **Yes** button.

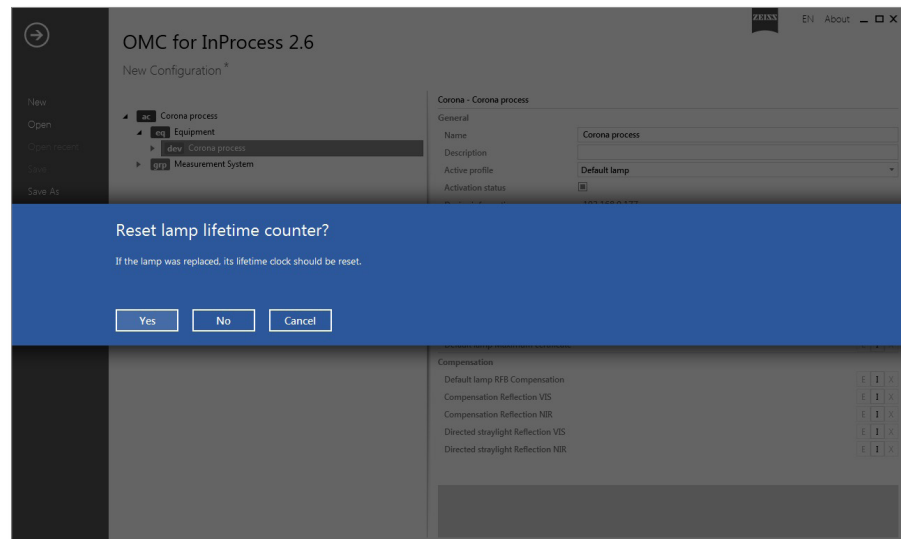


Fig. 29 Resetting the lamp counter

5 Selecting the certificate of the white standard

You will find the appropriate certificate on the attached CD, which is supplied in a folder in the storage case.

Compare the report number on the white standard with the one on the CD and select the appropriate csv file.

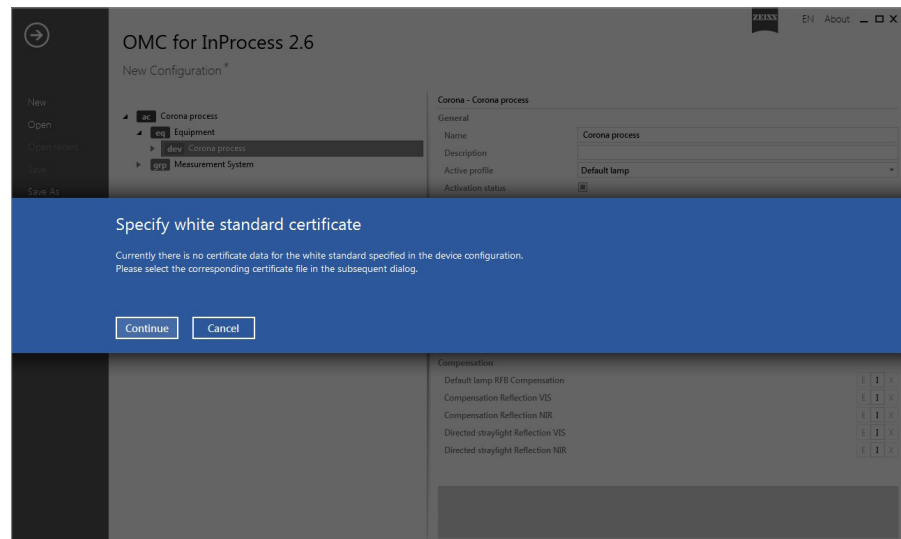


Fig. 30 Determining the white standard

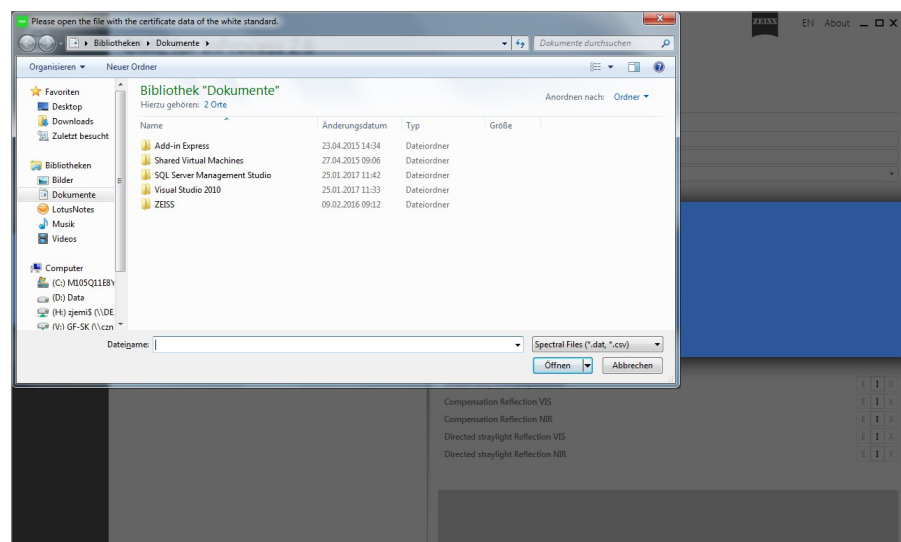


Fig. 31 Selecting the *.csv file

Note



Before continuing with the next steps, you should wait for 15 min in order to allow the lamps to warm up.

6 Aligning the Corona process

Caution



SENSITIVE COMPONENTS

Do not touch the white surface of the white standard with your fingers. Protect the white standard from dust and contamination. When not in use, cover with the supplied cover.

We recommend that you certify the white standard annually.

Insert the white standard in the standard holder at position P6.

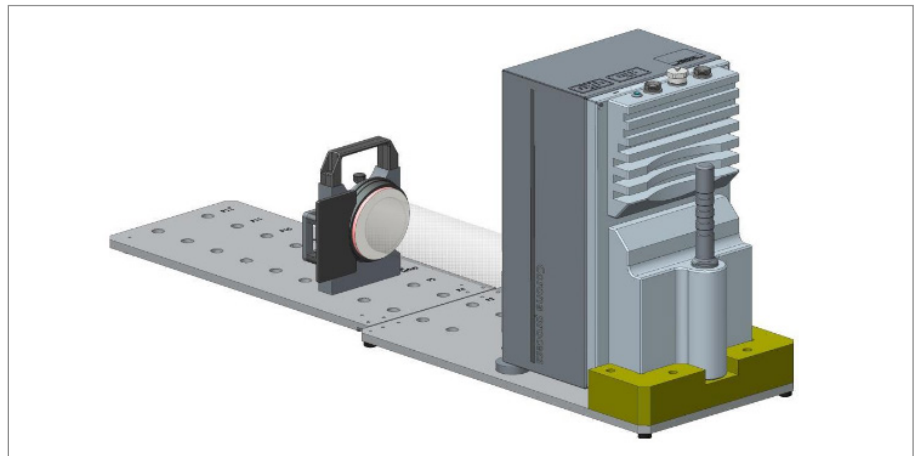


Fig. 32 Mounting the white standard

Adjust the **Corona process** with the adjusting screws so that the light beam is aligned to the center of the white standard.

When the **Corona process** has been successfully aligned, press the **OK** button.

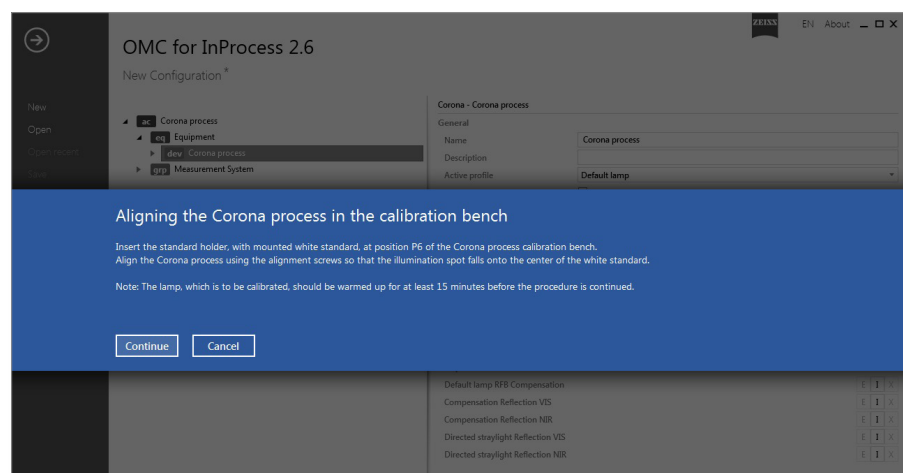


Fig. 33 Confirming the alignment

This process may take a few seconds.

7 White calibration

Position the standard holder **2** with the white standard **3** at position **P1**.

Loosen the clamping screw **5** and slide the white standard along its sliding axis **1** against the measuring window **4** of the **Corona process** until it touches the measuring window.

- 1** Sliding axis of the white/black standard
- 2** Standard holder
- 3** White standard
- 4** Measuring window
- 5** Clamping screw

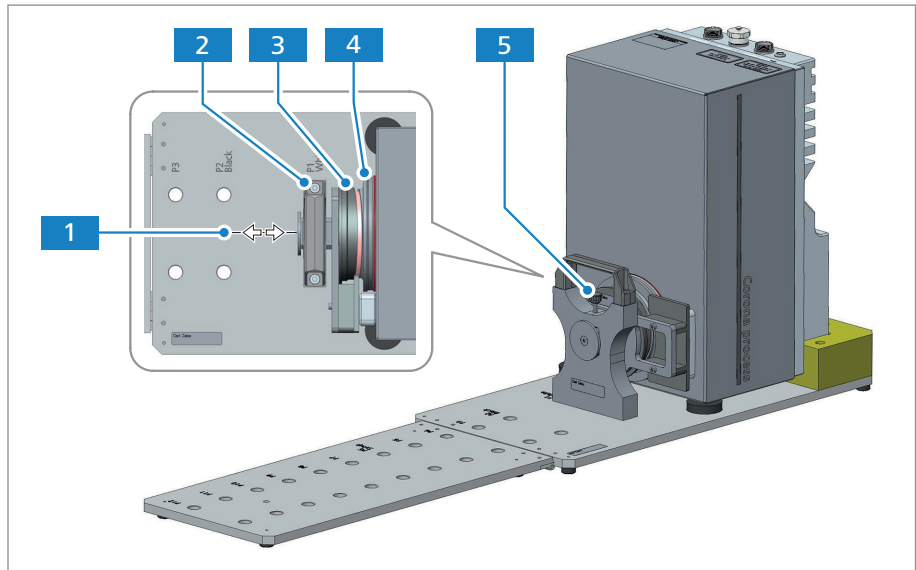


Fig. 34 Positioning the white standard

Fasten the white standard **3** in this position by tightening the clamping screw **5**.

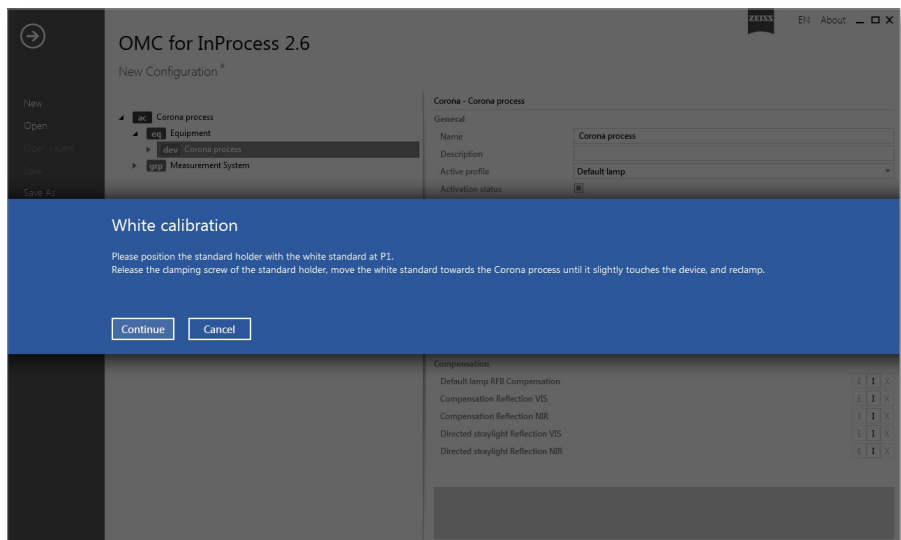


Fig. 35 Continuing the white calibration

Press the **OK** button to continue the process.

8 Black calibration

Loosen the fastening of the white standard and remove the standard holder from position **P1**.

Replace the white standard with the black standard and position the standard holder in position **P2**.

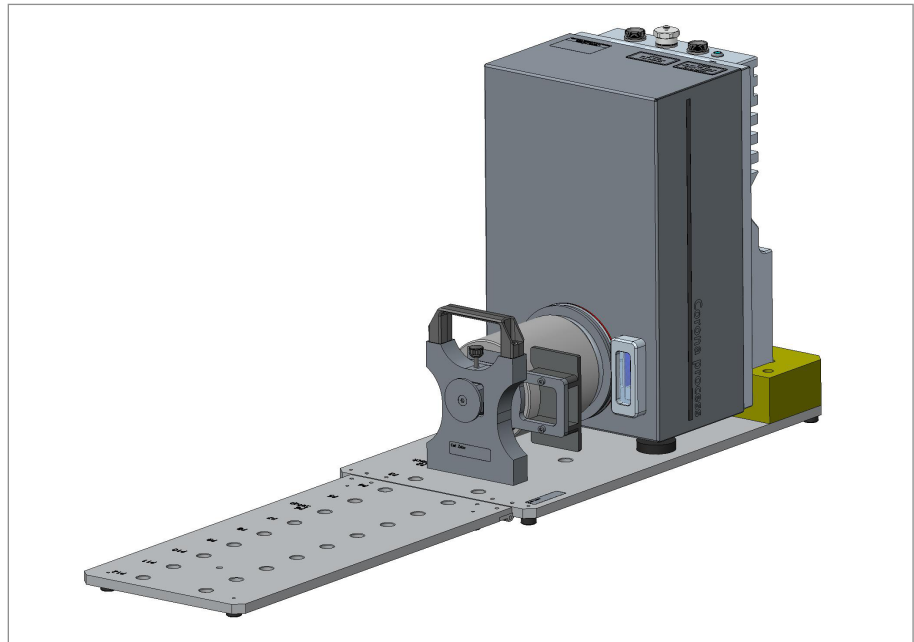


Fig. 36 Positioning the black standard

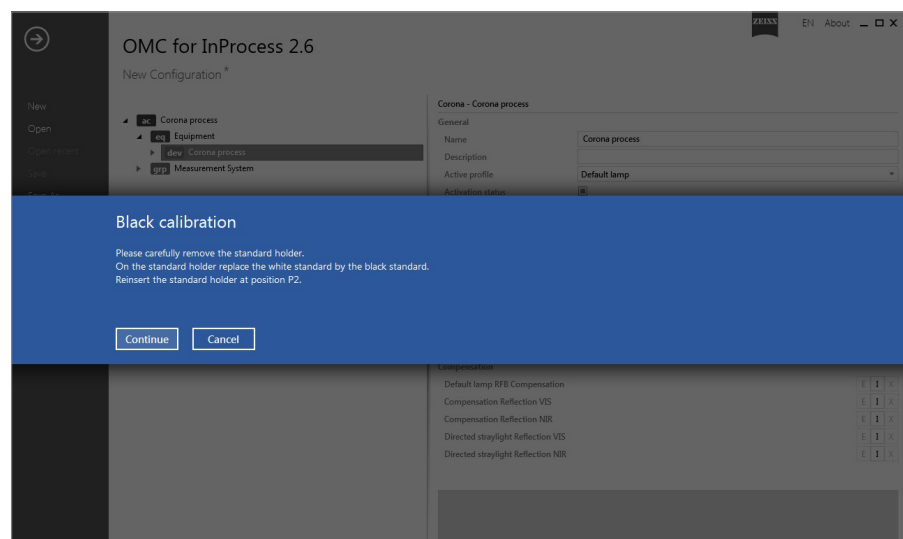


Fig. 37 Continuing the black calibration

Press the **OK** button to continue the process.

9 Acquisition of the spectra for the distance correction

Replace the black standard with the white standard again on the standard holder and position the standard holder in position **P1**.

Make sure that the white standard again fits closely against the measuring window and fix it in this position with the clamping screw (see Fig. 34).

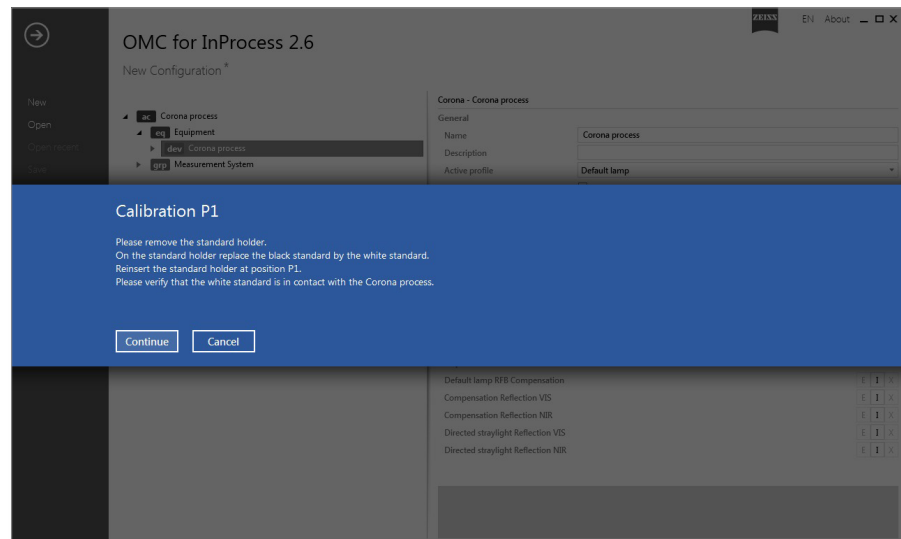


Fig. 38 Continuing the distance correction

Press the **OK** button to continue the process.

Position the standard holder incl. the white standard in position **P2**.

Press the **OK** button to continue the process.

Follow the instructions in the software and position the standard holder incl. the white standard until position **P12** has been reached.

10 Saving the distance correction

The calibration of the default lamp has been completed successfully and the correction has been saved under the following link: "C:\ProgramData\ZEISS\OSIS\Device\..."

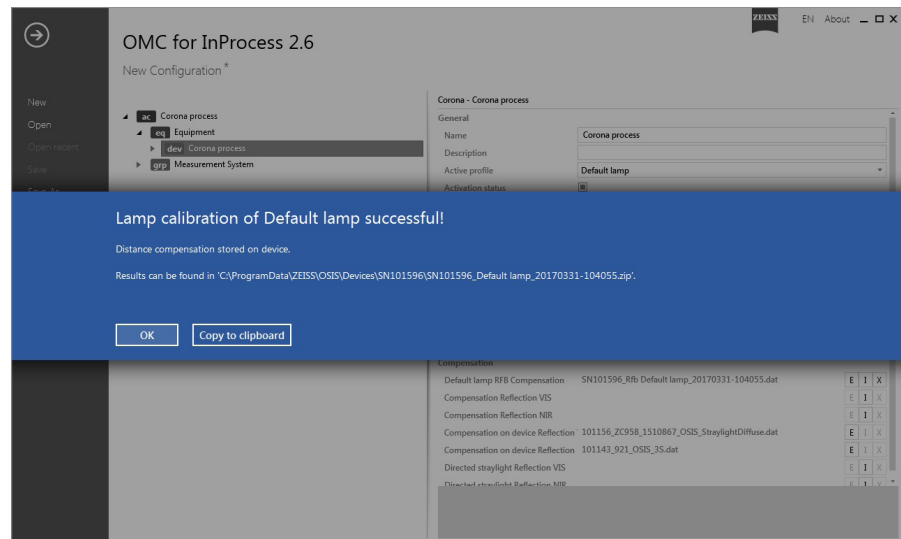


Fig. 39 Saving the distance correction

Press the **OK** button to continue the process.

Final measures 11 Calibration of the spare lamp

Now calibrate the spare lamp by right-clicking on **dev Corona process** and selecting **Calibration of spare lamp**.

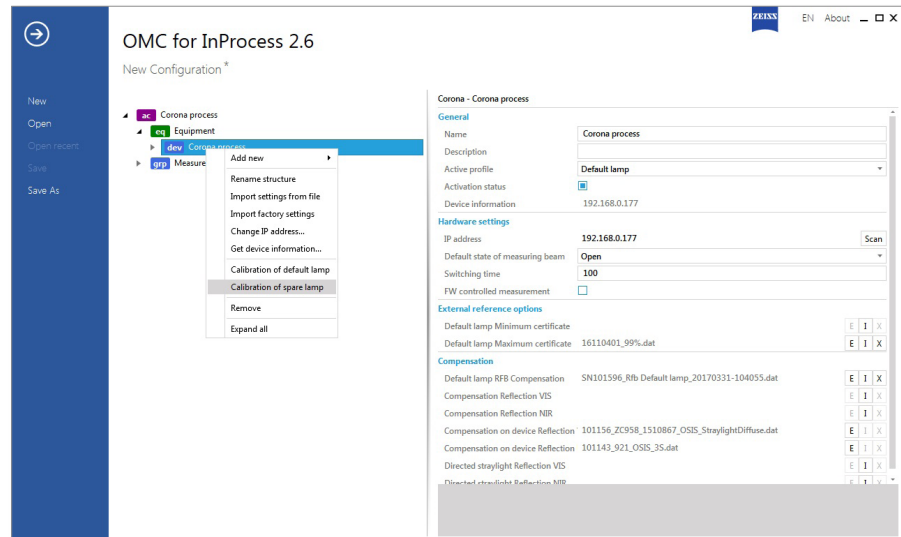


Fig. 40 Selecting a spare lamp

Repeat steps 4 to 10 for the spare lamp.

The **Corona process** measuring system is again ready for operation.

7.4 Accessories and spare parts

Accessories – Hardware

Name	Order number
PC 5000, 64-bit, Win 8.1, incl. mouse and keyboard	000000-0560-678
23" touchscreen monitor P2314T black / DELL	000000-0578-819
24" monitor U2412M black / DELL	000000-0551-321

Accessories – Ethernet cables

Name	Order number
Ethernet cable for Corona (3 m)	000000-2036-573
Ethernet cable for Corona (5 m)	000000-2162-798
Ethernet cable for Corona (7 m)	000000-2102-398
Ethernet cable for Corona (10 m)	000000-2119-388
Ethernet cable for Corona (15 m)	000000-2058-862
Ethernet cable for Corona (60 m)	000000-2146-834
RJ45 connector, with insulated ends	000000-0483-496
LEMO connector for Ethernet cables, 14-pin	000000-0547-290

Accessories – PS cables

Name	Order number
Power supply cable for Corona (3 m)	000000-2162-817
Power supply cable for Corona (5 m)	000000-2162-818
Power supply cable for Corona (7 m)	000000-2162-819
Power supply cable for Corona (10 m)	000000-2118-527
Power supply cable for Corona (15 m)	000000-2043-011
LEMO connector for power supply, 3-pin	000000-0547-288
Laboratory power supply unit	000000-2045-548

Accessories – Digital- IN/OUT cables

Name	Order number
Digital IN/OUT cable for Corona (3 m)	000000-2035-658
Digital IN/OUT cable for Corona (5 m)	000000-2162-789
Digital IN/OUT cable for Corona (7 m)	000000-2162-791
Digital IN/OUT cable for Corona (10 m)	000000-2119-389
Digital IN/OUT cable for Corona (15 m)	000000-2102-399
LEMO connector for Digital IN/OUT cable, 10-pin	000000-0547-289
Cover cap for Digital IN/OUT socket	000000-0583-776

Accessories – Flushing rings

Name	Order number
ClearView flange	000000-2164-968
Air purge ring	000000-2192-999

Accessories – Fastening

Name	Order number
Mounting package	000000-2107-066

Accessories – Software

Name	Order number
InProcess Software 2.x	000000-2107-128
Software update to InProcess 2.x	000000-2114-851
The Unscrambler (calibration development software, CAMO)	000000-1360-276
OLUP (prediction engine, CAMO)	000000-1358-416
OLUC (classification engine, CAMO)	000000-1358-414
UCAL (prediction engine, Unity Scientific)	000000-2058-929

Communication interfaces – Software

Name	Order number
ProcessLinker	000000-2096-862
OSIS SDK 1.1.1	000000-2101-333

Communication interfaces – Hardware

Name	Order number
USB 3.0 with 10/100/1000 MBit Ethernet adapter	000000-0506-547
2x analog out 4–20 mA Beckhoff terminal with bus coupler	000000-2161-639
Junction box 100 W	000000-2172-305
Sampling button with connecting cable (3 m)	000000-2184-210
Sampling button with connecting cable (5 m)	000000-2186-146

Accessories – TURNSTEP

Name	Order number
TURNSTEP	000000-2156-193
TURNSTEP adapter for petri dishes, 60 mm	000000-0455-055
TURNSTEP adapter for petri dishes, 80 mm	000000-0455-054
TURNSTEP adapter for petri dishes, 92-100 mm	000000-2152-369
TURNSTEP adapter for petri dishes, 150 mm	000000-0469-085
Petri dish, Ø 190 mm, height 100 mm	000000-0455-659
Petri dish, Ø 190 mm, height 200 mm	000000-0573-705
Petri dish, Ø 80 mm, height 20 mm	000000-0467-718

Spare parts

Name	Order number
Corona porocess calibration bench	000000-2211-998
White standard (certified)	000000-2199-320
Black standard	000000-2199-318
Spare lamp	000000-2219-967

7.5 Storage and transport

The system is not provided with any special mountings or safety devices for transport. We recommend transporting the device in its original packaging.

Although the components are very robust, violent jolts must be avoided. You should also use the original packaging to return the device in the event of complaints or for servicing.

Observe the environmental parameters for storage or transport of the device specified in Section 8 "Technical data".

7.6 Disposal

Note



Defective devices must not be disposed of with household waste, but should be disposed of in compliance with the relevant legal requirements.

This product has been developed, inspected and produced in accordance with the applicable environmental regulations and directives of the European Union.

The product and its accessories comply with EU Directives 2002/95/EC (RoHS) and 2002/96/EG (WEEE) to the extent applicable to this product.

We have installed a take-back and recycling process that ensures proper recycling in accordance with the above-mentioned EU Directives.

For details concerning disposal and recycling, please contact your local dealer or service organization.

The device must not be disposed of as domestic waste or via municipal waste disposal facilities.

If the product is resold, the seller is obligated to inform the purchaser regarding its proper disposal.

8 Technical data

All technical data, dimensions and weights specified in the present User Manual refer to and were valid at the time of printing.

Individual aspects of this data may deviate from the situation of the specific system in hand without any substantial change in the user information.

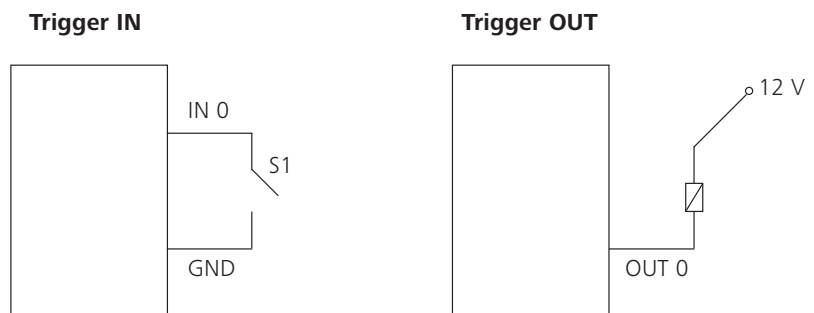
Mechanical parameters	
Dimensions (W x H x D)	360 x 279 x 220 mm
Weight	15.0 kg
Ambient parameters	
Operating temperature	– 10 °C to +50 °C
Storage/transport temperature	–40 °C to +70 °C
Protection class	IP 67, ATEX Zone 22
Max. humidity	95 % non-condensing
Max. altitude for operation	2000 m
Electrical connection conditions	
Power supply	12 or 24 V DC (24 V DC recommended)
Operating voltage range	10–36 V DC
Power consumption	40 W
Inrush current	< 4 A
Interfaces	
Communication	Ethernet 100 MBit/s
Removal of spectrometer – PC	< 80 m (at least cable of category 6 recommended for indoors)

Tab. 3 General technical data

Optical parameters	
Spectrometer	High-power light source with excellent optical properties and internal referencing
Usable spectral range	380 – 1650 nm
Spectral resolution (half tenth value width)	≤ 10 nm
Wavelength accuracy	≤ 1.0 nm
Wavelength drift	≤ 10 pm/K
Geometry	0°/0°
Min. integration time	3 ms
Amplitude digitization	16 bits
Measuring distance	90 to 600 mm
Measuring spot	> 30 mm
Max. measurement frequency	1 Hz
Light source, lifetime	2 halogen lamps (1 redundant), each 10,000 h
Warm-up time	< 30 min

Tab. 4 Optical parameters

Interface description



Tab. 5 Interface description