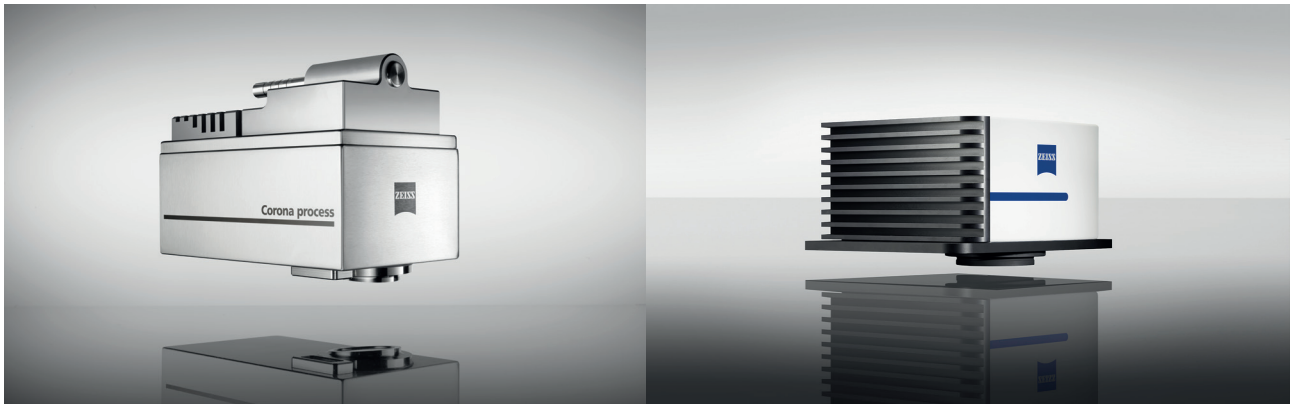

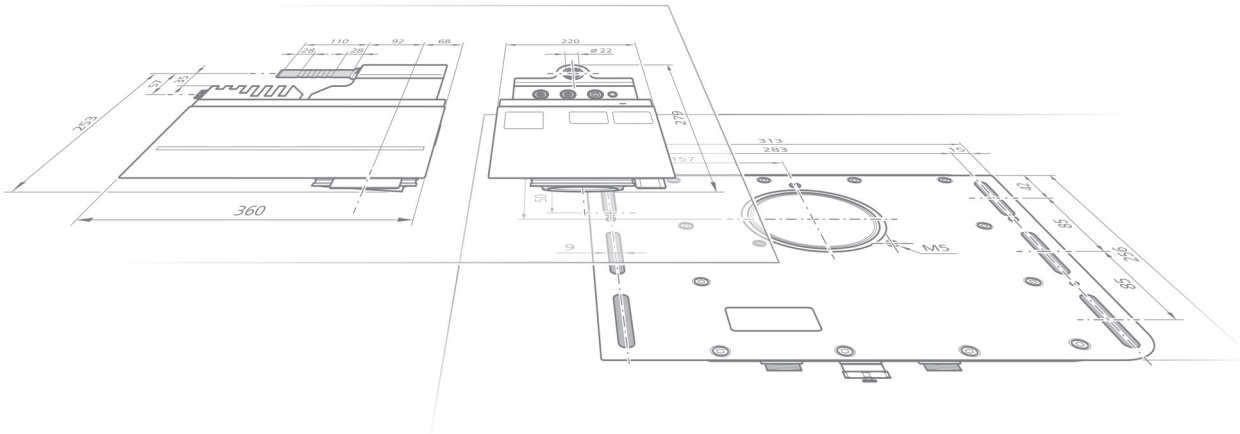

Instructions for preparing an installation

Corona process & Corona extreme

Carl Zeiss Spectroscopy GmbH

Knowledge of this manual is required for preparing the installation of the device. Please familiarize yourself with the content and follow the instructions.

We reserve the right to make changes in the interest of technological advancement; the installation preparation guide is not subject to updating or revision.

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Carl Zeiss Spectroscopy GmbH
Carl-Zeiss-Promenade 10
07745 Jena, Germany

Service: + 49 3641 64-3200
Phone: + 49 3641 64-2838

Email: service.spectroscopy@zeiss.com
www.zeiss.com/spectroscopy

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1 About this guide

1.1 Purpose of this guide

The information contained in this manual allows you to plan and prepare the structural measures necessary for installing your new **Corona process** or **Corona extreme** spectrometer system.

To integrate the new spectrometer system into the local production environment, the following steps must be carried out:

- Preparation of the mechanical interface,
- preparation of the electrical interface and
- preparation of the data interface.

1.2 Readers

This installation guide is intended for customers and distributors of Carl Zeiss Spectroscopy GmbH.

Technical training and/or experience in the handling of measuring technology are required for preparing the installation.

2 Preparing mechanical interfaces

2.1 Corona process

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

The optical system can determine the ingredients and color of solid and pasty organic materials at a distance of 100 – 590 mm from the sample, e.g. above an open transport system, a mixer or dryer.

Depending on the chemometric model used, the wavelength range of 380 – 1650 nm allows moisture, protein, fat and other ingredients to be determined, as well as color, e.g. for process optimization and control in the production of food.

The following points must be observed when planning and installing the spectrometer system:

1 Find a suitable measuring site for your application. Check the ambient conditions. The following values must not be exceeded:

Operating temperature	–10 to +50 °C
Max. humidity	95 % non-condensing
Altitude	up to 2000 m

Tab. 1 Ambient conditions for Corona process

2 When scheduling the installation, bear in mind that the system or plant into which the spectrometer is being integrated must be inactive.

3 Ensure that the customer's mechanical interface has the appropriate dimensions for mounting the **Corona process** (see also Fig. 1 and Fig. 2).

The device must be strong enough to carry the weight of the **Corona process** unit (15 kg), and be vibration-free.

Accessories which are specially designed for the **Corona process** application areas, e.g. the mounting package (000000-2107-066), allow easy and fast integration into your plant and production line.

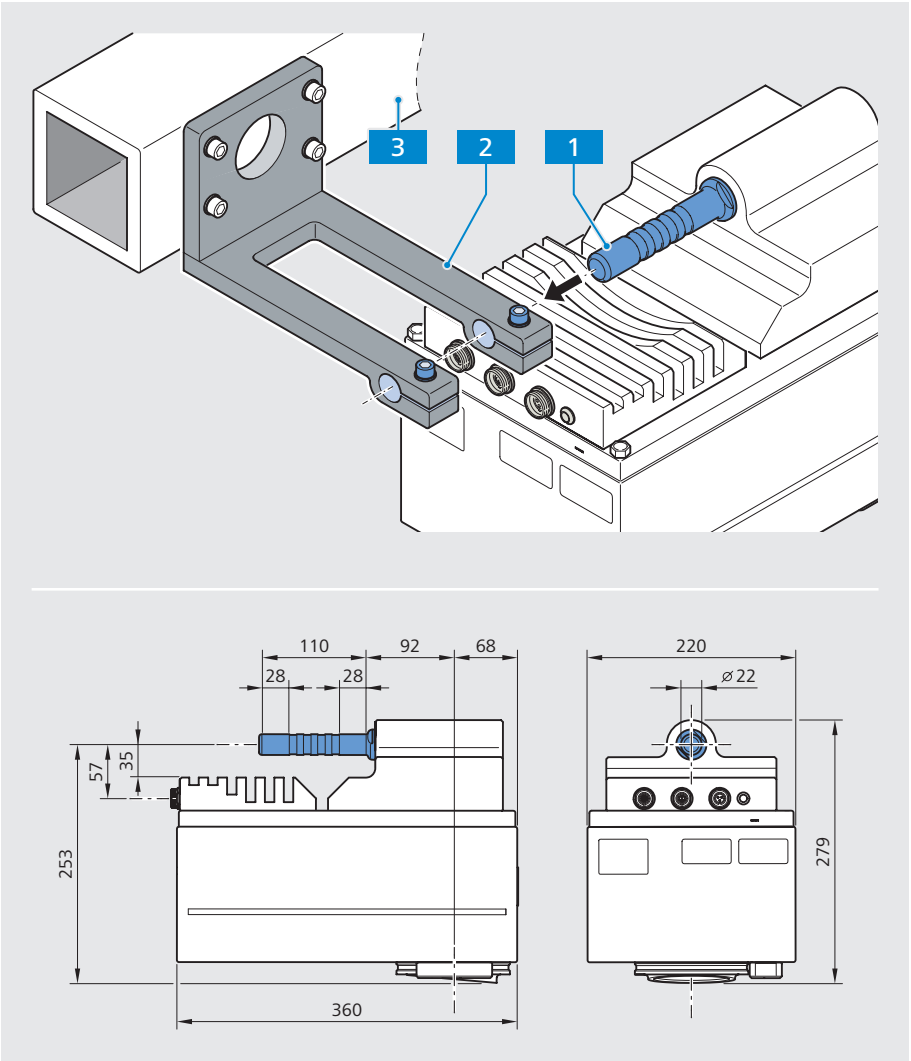


Fig. 1 Mechanical interfaces of the Corona process

1 **Mounting interface** – *mandrel of diameter 22 mm, length 110 mm*

Option 1: *Assembly **of Corona process** with optional mounting device*

Option 2: *Assembly of **Corona process** using customer's own mounting device. The connection dimensions are shown in the diagram above.*

2 **Optional mounting device** *(see Fig. 2 on the following page) – part of mounting package (000000-2107-066)*

3 *Customer-specific mechanical interface*

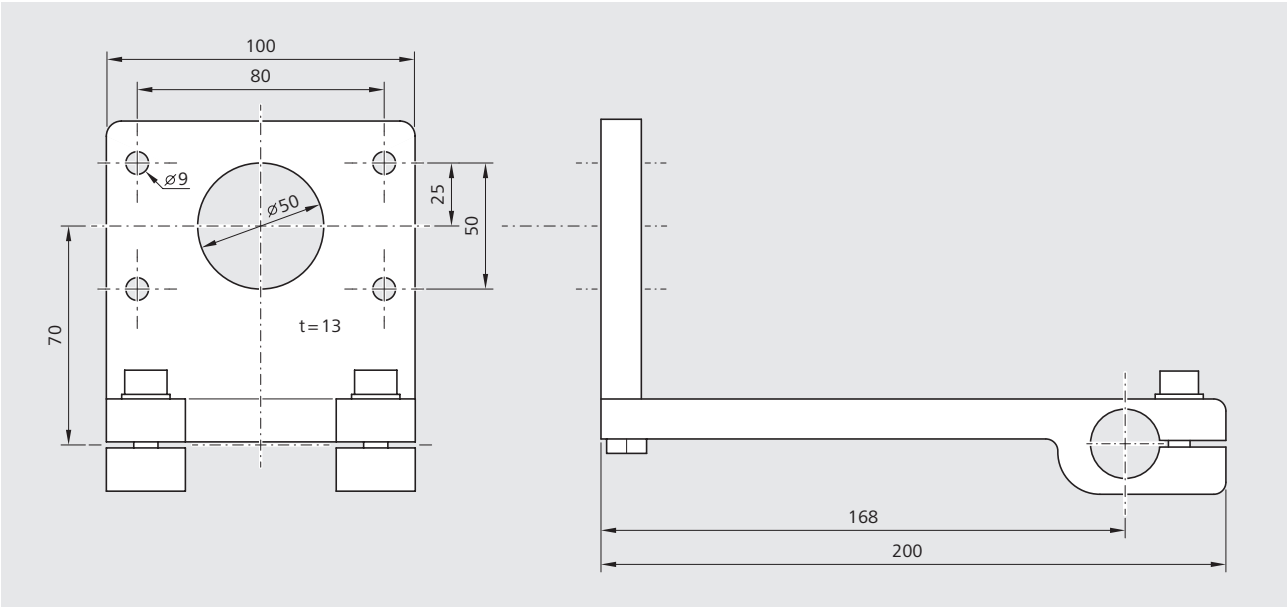


Fig. 2 Dimensions of the optional mounting device

4 Ensure that all cables (power, Ethernet and digital I/O cables) are protected and can be routed free of mechanical and thermal stress.

5 For optimal use of the **Corona process**, we recommend installing the spectrometer system in such a way that the sample is transported first past the distance sensor 1 and then past the measuring window 2 .

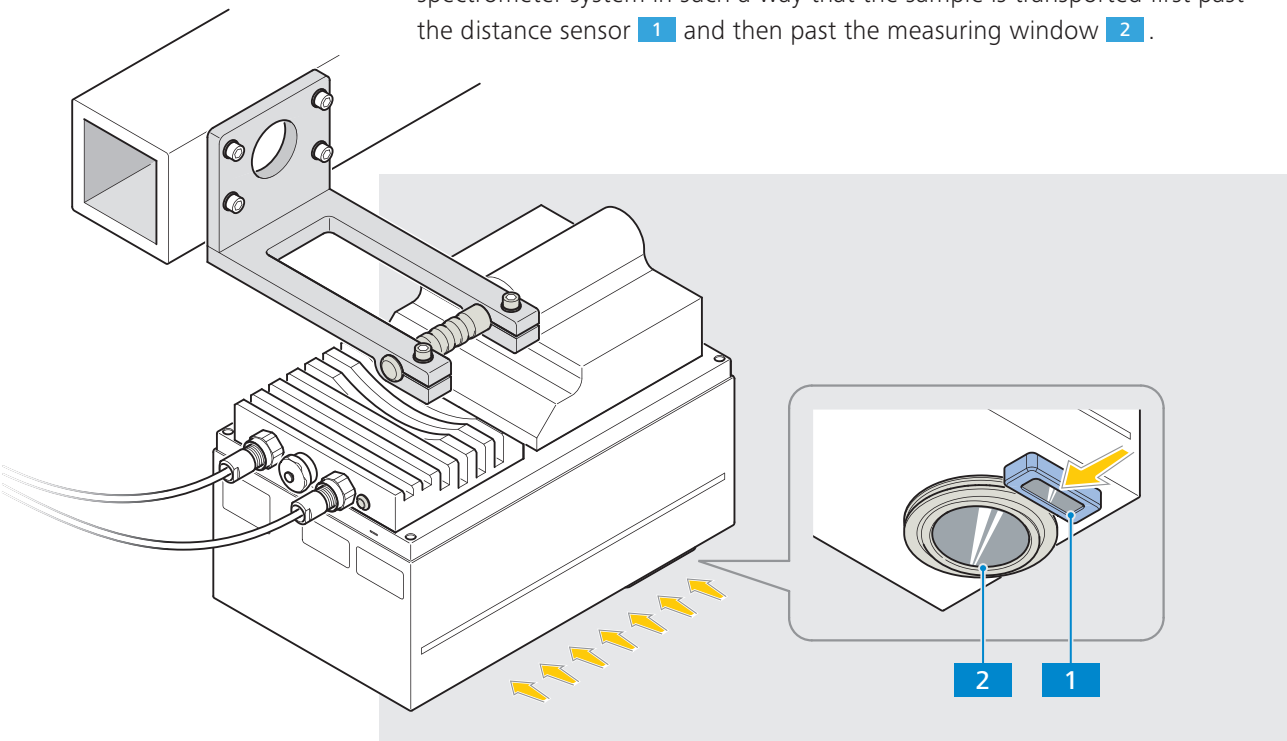
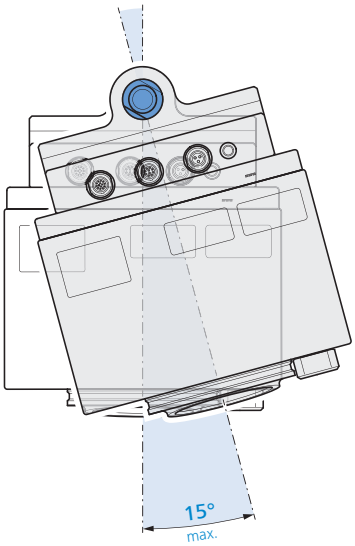


Fig. 3 Direction of sample transport

6 The **Corona process** must be mounted at a low angle (< 15°) between 100 and 590 mm (optimum distance 300 mm) above the sample.

Take this into account when assembling the **Corona process** in the optional mounting device or when planning and constructing a customer-specific mechanical interface.



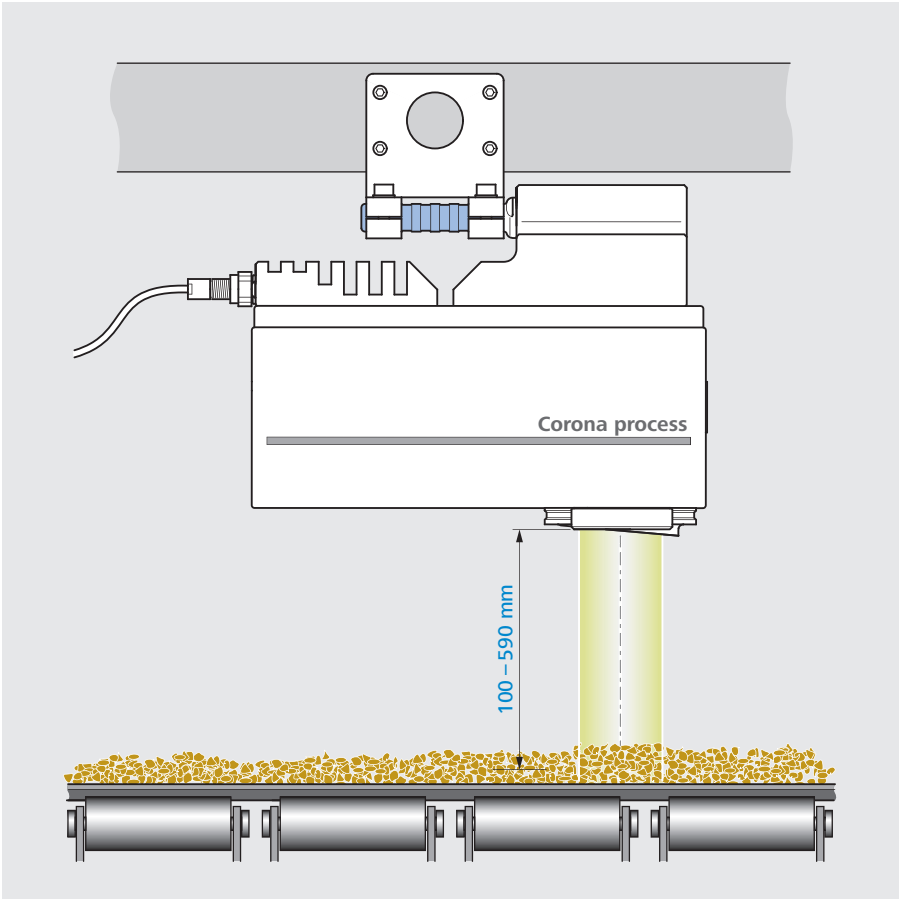


Fig. 4 Distance to sample

2.2 Corona extreme

The various versions of the **Corona extreme** spectrometer system have been specifically developed for use in harsh environments. This allows them to be used in agriculture and in the food industry.

The optical concept allows for an analysis of ingredients of organic materials in solid, pasty and liquid form in closed systems, such as pipelines, mixers or similar.

Depending on the chemometric model used, the wavelength range of 950 – 1650 nm can be used to detect moisture, protein, fat and other ingredients, e.g. for quality assessment of incoming goods, or for process optimization and control in the production of food.

The following points must be observed when planning and installing the spectrometer system:

1 Find a suitable measuring site for your application. Check the ambient conditions. The following values must not be exceeded:

Operating temperature	–15 to +50 °C
Max. humidity	95 % non-condensing
Altitude	up to 2000 m

Tab. 2 Ambient conditions for Corona extreme

2 The **Corona extreme** spectrometer should be installed in a position which ensures that there is always sample material in front of the measurement window during the measurement process.

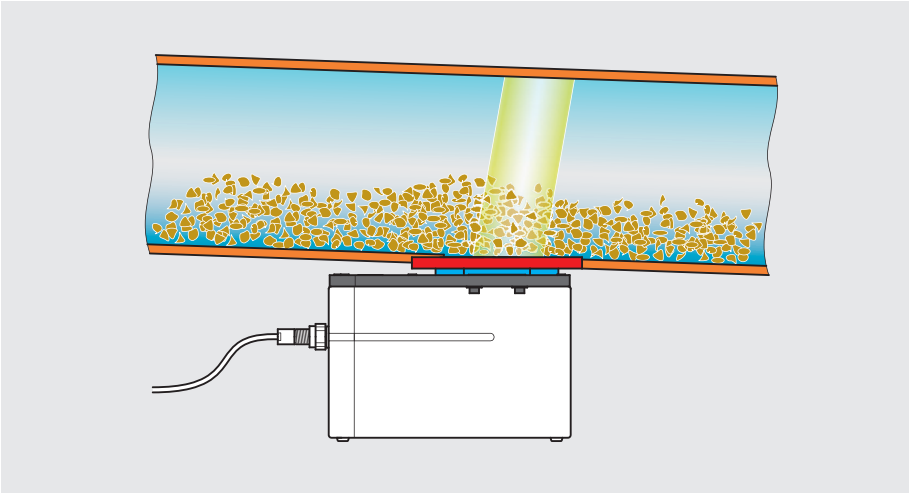


Fig. 5 Operating principle

3 When scheduling the installation, bear in mind that the system or plant into which the spectrometer is being integrated must be inactive.

4 **Corona extreme** can only be installed with a ZEISS flange in customer systems. A suitable flange must be selected for the type of application and measurement. A suitable interface must be created for these flanges in the customer's plant.

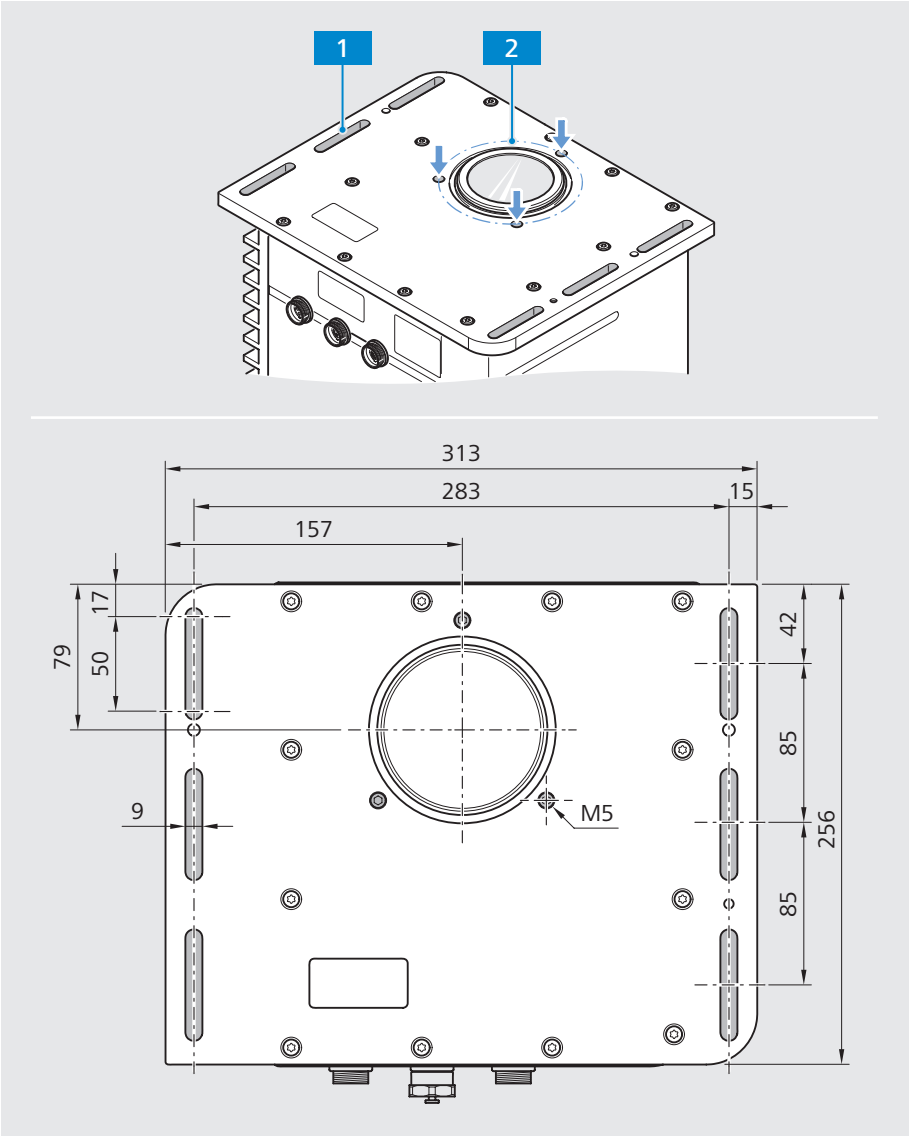


Fig. 6 Mechanical interfaces of the Corona extreme

1 **Interface 1** – *base plate with 6 slotted holes (50 x 9 mm)*

Option 1: *Attaching Corona extreme with pre-installed standard flange (000000-2156-591) to a customer interface using the 6 slotted holes.*

Option 2: *Attaching the power flange (000000-2161-449) or the standard flange ST (00000-2360-837) to a customer interface and then mounting the Corona extreme on these flanges through the slotted holes.*

Option 3: *Attaching the GEA flange (000000-2162-728) to a customer interface and then fixing the Corona extreme directly to the flange with pipe clips at the place of use.*

2 **Interface 2** – *3x threaded insert (M5) around the measuring window*

The various flanges and the corresponding customer interfaces are described below.

2.2.1 Option 1 – Standard flange (000000-2156-591)

The standard flange is designed for the use of the **Corona extreme** on level surfaces, such as the flat underside of a conveyor shaft.

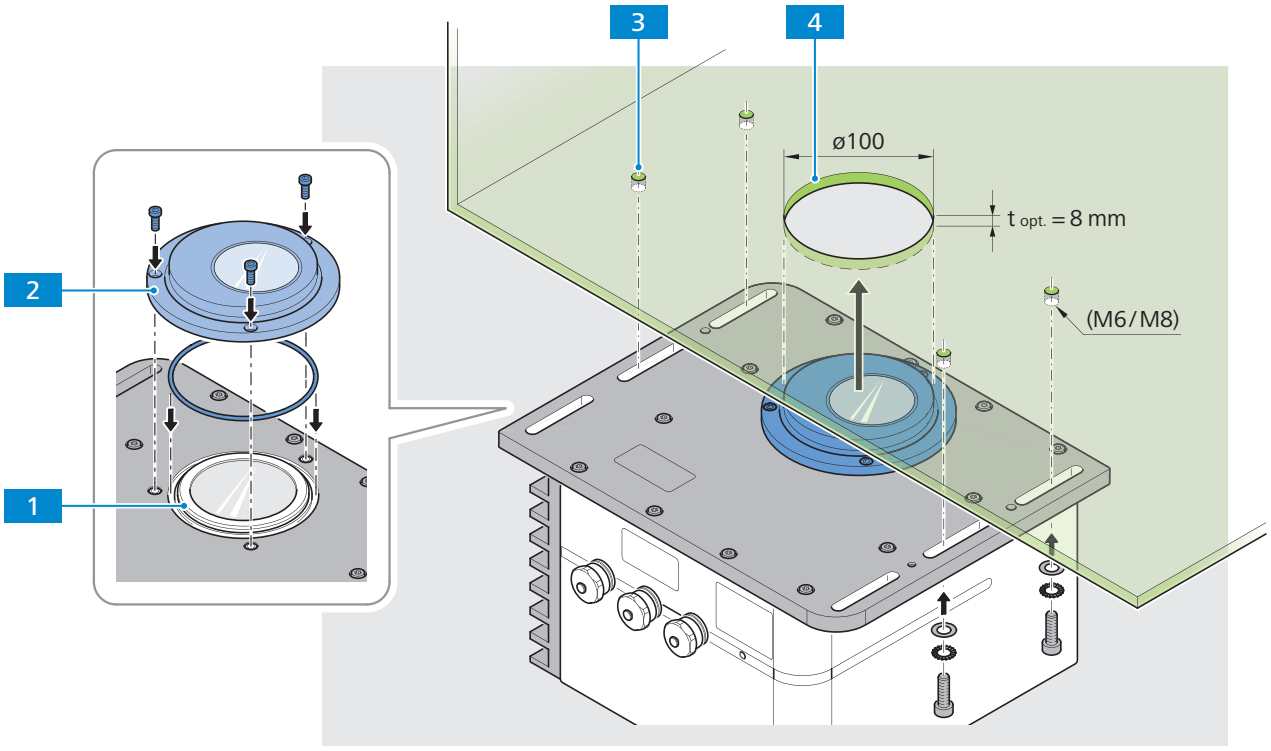


Fig. 7 Corona extreme – mounting with standard flange

1 *Mechanical interface on the Corona extreme measuring window*
2 *Standard flange (000000-2156-591)*
3 *at least 4x threaded holes (M6 / M8) in a customer interface*
NOTE:
The holes must be congruent to the slotted holes of the Corona extreme base plate, see "Fig. 6 Mechanical interfaces of the Corona extreme" on page 12.
4 *Circular opening, ø 100 mm, in a customer interface*

2.2.2 Option 2 – Power flange (000000-2161-449) and Standard flange ST (000000-2360-837)

The **power flange** is suitable for mounting the **Corona extreme** in conveyor systems where there is over or underpressure or pressure changes during the process. It is designed for over- and under-pressures of up to 5 bar.

The **standard flange ST** is suitable for mounting **Corona extreme** on conveyor systems where there is no over or underpressure. It is ideally suited for use with flowing and powdery materials in screw conveyors, slides, trough or pipe chain conveyors.

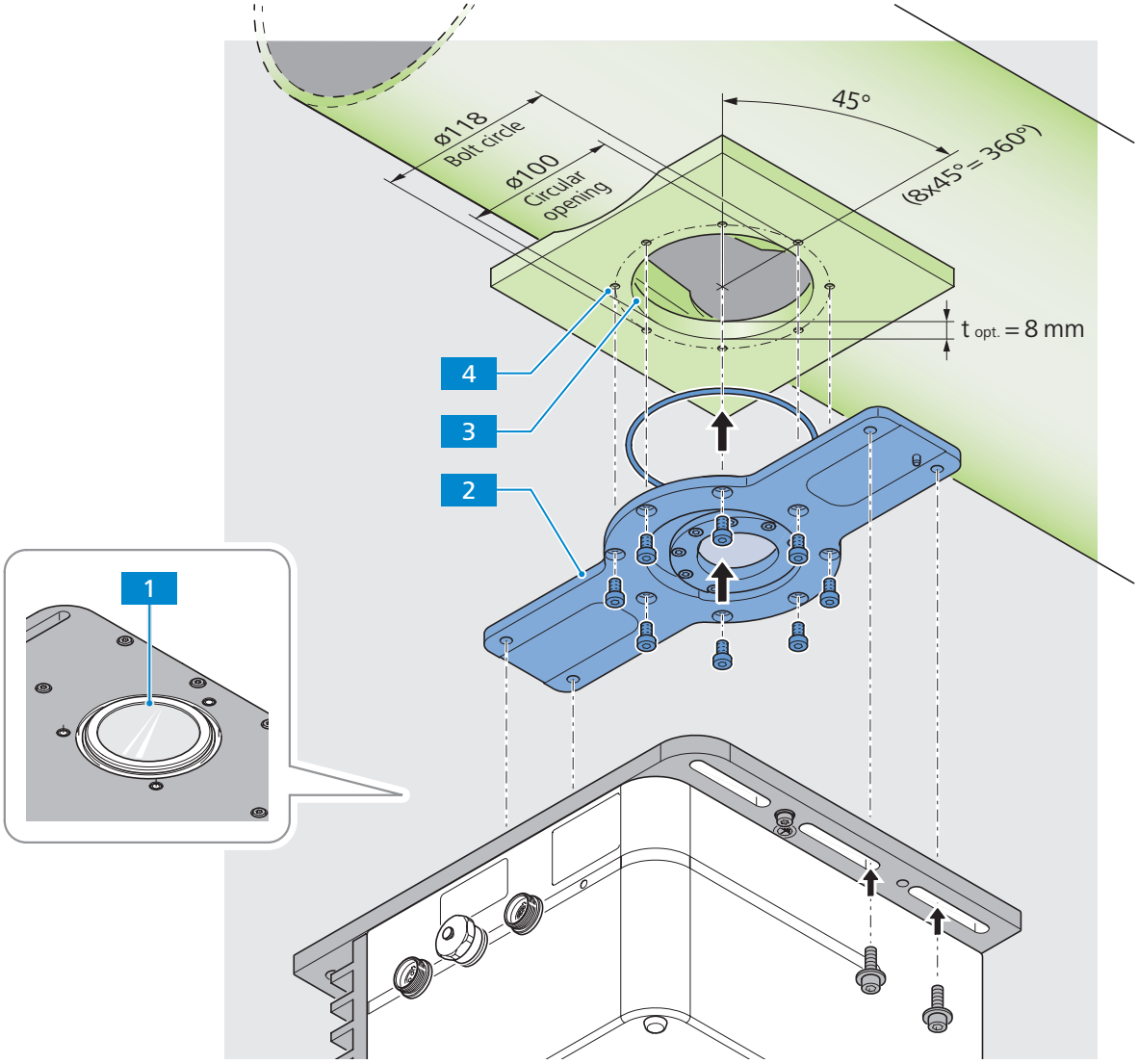


Fig. 8 Corona extreme – mounting with power flange or standard flange ST

1 *Mechanical interface on the Corona extreme measuring window*
2 *Power flange (000000-2161-449) or Standard flange ST (000000-2360-837)*
3 *Circular opening, ø 100 mm, in a customer interface*
4 *8x threaded holes (M6) in a customer interface, bolt circle, ø 118 mm*

2.2.3 Option 3 – GEA flange (000000-2162-728)

The GEA flange is used for pipes. It is suitable for connecting **Corona extreme** to a GEA VARINLINE Type N housing.

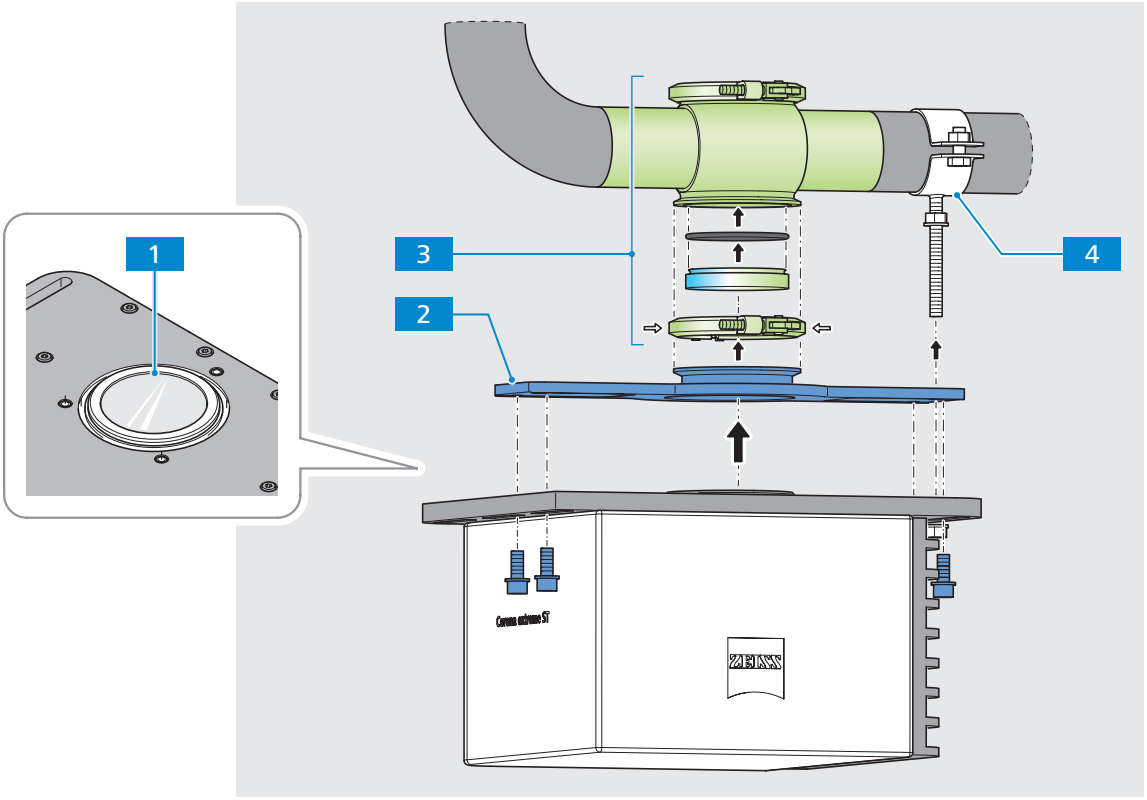


Fig. 9 Corona extreme – mounting using the GEA flange

1 *Mechanical interface on the Corona extreme measuring window*
2 *GEA flange (000000-2162-728)*
3 *GEA VARINLINE® housing with process connection type N (incl. sight glass, -O-ring and clamping ring)*
4 *Pipe clip (000000-0580-763 or 000000-0580-762)*

If you have decided to integrate your **Corona extreme** using a GEA flange, select a VARINLINE® housing which is suitable for your pipe diameter from the following tables (see next page).

The VARINLINE® housings can be purchased directly from GEA.

GEA VARINLINE® housing with process connection Type N – connection dimensions:

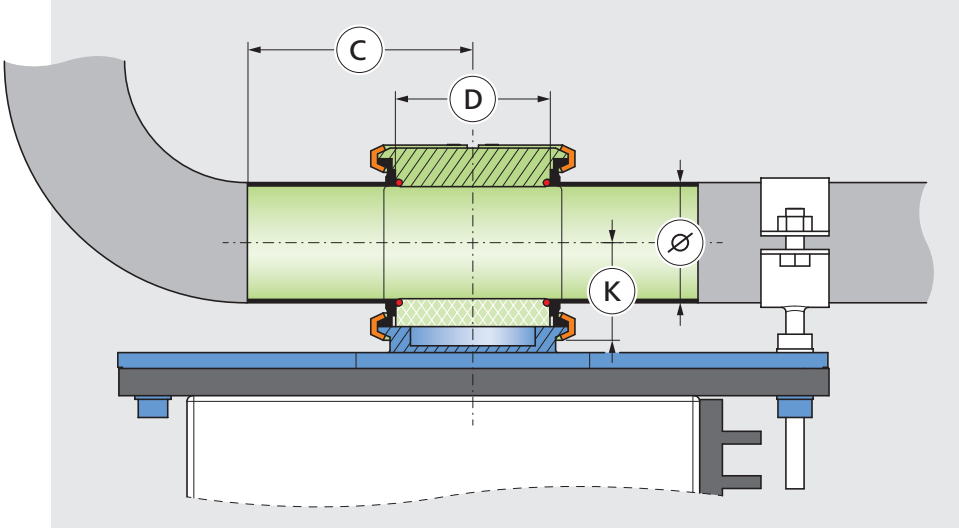


Fig. 10 GEA flange – connection dimensions

Metric

External diameter according to DIN 11850, series II, DIN 11866, series A

Nominal width		**ø**	**C**	**D**	**K**
DN	40	41 x 1.5	90	68	36
DN	50	53 x 1.5	90	68	42
DN	65	70 x 2.0	125	68	50
DN	80	85 x 2.0	125	68	57.5
DN	100	104 x 2.0	125	68	67
DN	125	129 x 2.0	125	68	79.5
DN	150	154 x 2.0	150	68	92

ISO

External diameter according to DIN EN ISO 1127, 1.4435 / 316L

Nominal width		ø	C	D	K
ISO	42.4	42.4 x 2.0	114.3	68	36.25
ISO	48.3	48.3 x 2.0	114.3	68	39.25
ISO	60.3	60.3 x 2.0	114.3	68	45.5
ISO	76.1	76.1 x 2.0	152.4	68	53.5
ISO	88.9	88.9 x 2.3	152.4	68	59.5
ISO	114.3	114.3 x 2.3	152.4	68	72.0

Inch OD

External diameter based on ASME-BPE-a-2004, DIN 11866, series C

Nominal width		ø	C	D	K
1½"	OD	38.1 x 1.6	90	68	34.5
2"	OD	50.8 x 1.6	90	68	40.75
2½"	OD	63.5 x 1.6	125	68	47.0
3"	OD	76.2 x 1.6	125	68	53.5
4"	OD	101.6 x 2.0	125	68	65.75

Inch IPS

Outer diameter, IPS Sch 5

Nominal width		ø	C	D	K
2"	IPS	60,3 x 2.0	114.3	68	45.5
3"	IPS	88,9 x 2.3	152.4	68	59.5
4"	IPS	114,3 x 2.3	152.4	68	72.0
6"	IPS	168,3 x 2.7	152.4	68	98.0

3 Preparing electrical interfaces

3.1 Inline installation – Option 1: Connection via industrial power supply unit

The recommended power supply unit should be used to supply power to inline installations of the **Corona extreme** and **Corona process** spectrometer systems. The ingress protection rating of this power supply is IP 67.

If the Corona system is ordered with an industrial power supply, the Corona system and the power supply unit are connected by means of a pre-assembled power supply cable.

The industrial power supply unit should be mounted at a suitable location in the vicinity of the Corona system (wall, column, support structure, etc.) and connected to the mains power supply via a power supply cable.

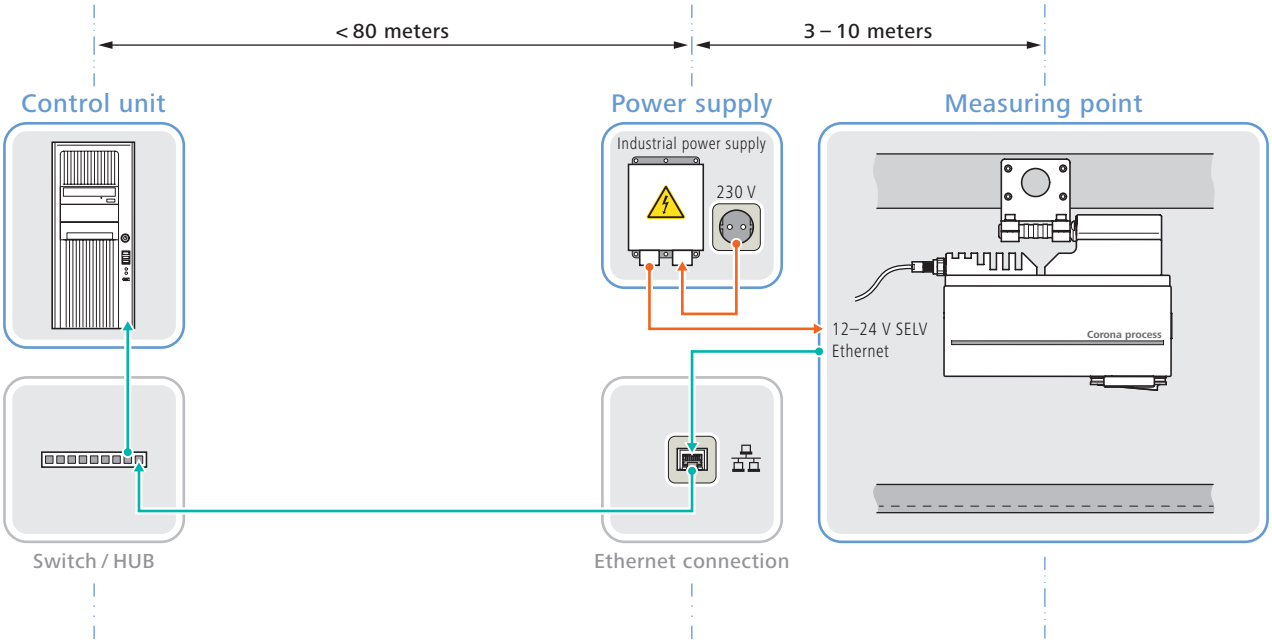
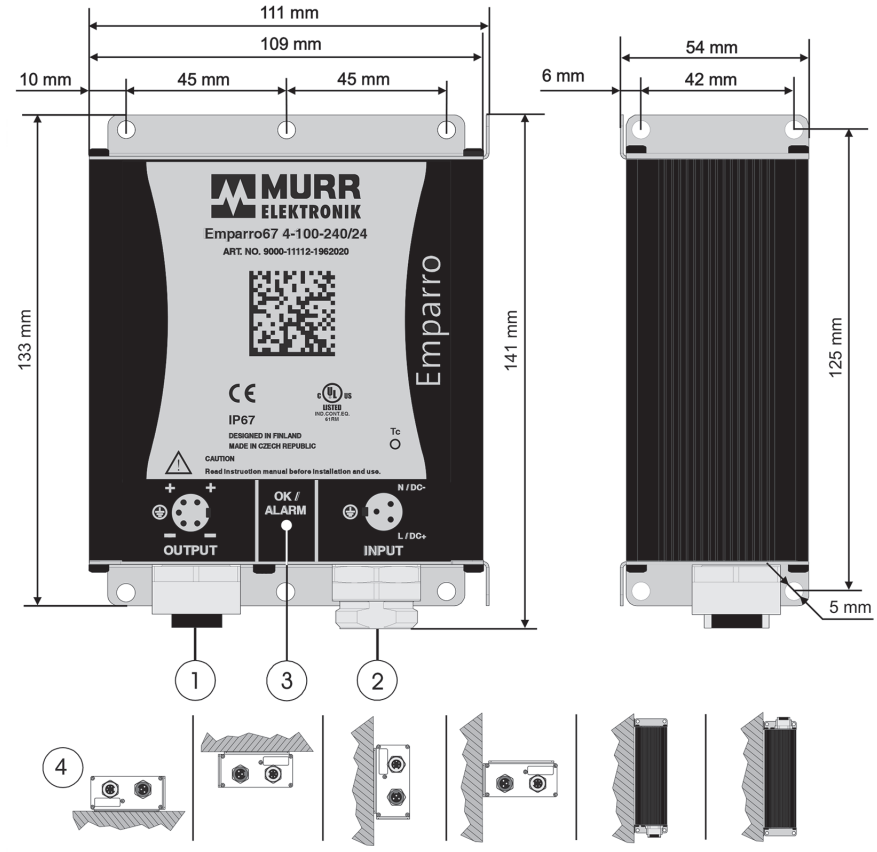


Fig. 11 Installation diagram – Power supply (shown in red) via industrial power supply unit

Important information from Murr Elektronik regarding the connection dimensions and technical data, as well as details on the installation of the Emparro67 series industrial power supply unit:

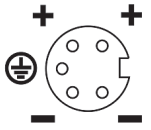


(2) Technical specification, Art. No. 9000-11112-1962020	**Rev. 1.5**
Nominal voltage	100 - 240 VAC, 100 - 240 VDC
Input voltage range	90 - 265 VAC, 90 - 370 VDC
Power distribution systems	TN, TT, IT mains
Nominal frequency	50 - 60 Hz ±6%
Input current, $I_{nom.}$	1,1 A / 100 - 0,5 A / 240 VAC / VDC
Inrush current / I²t	< 6 A / 230 VAC after 1 ms / 0,16 A²s
Efficiency, typ.	91,7% / 115 VAC - 92,4% / 230 VAC
Power factor, typ.	0,98 with 230 VAC
Output power	96 W
Power losses	< 7,9 W with 230 VAC
No-load power losses Ⓐ	< 1 W with 230 VAC
Internal fuse	6,3 A (T)
External fuse max.	20 A (T) in building installations. Circuit breaker type B or C recommended.
Safety class	1
Output voltage, fixed	24,1 VDC
Static regulation accuracy	+/-2%
Dynamic regulation accuracy typ.	0->100%, 5% 2ms / 100%->5%, 5% 2ms
Start-up time	< 500 ms
Hold up time of the output	> 45 ms / 230 VAC
Output current, continuous 24 VDC	4 A (+60°C) / 2,4 A (+70°C)
Output current (power boost)	6 A / > 5 s
Output current, short circuit, typ.	4,4 A
Output ripple	< 20 mV_{rms}
Overloading / overtemperature protection	Yes
Overvoltage supervision	Yes
Relative humidity	4 - 100%
Maximum surrounding air temperature (Ta)	-40°C - +85°C (> +60°C derating)*
Operator access area	-40°C - +40°C
Storage temperature	-40°C - +85°C
Protection degree of the housing, EN 60529	IP67
Dimensions W x H x D; Weight	111 x 141 x 54 mm; 1,1 kg

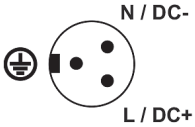
* UL approval max. surrounding air temperature -40°C - +80°C

(3) Features

[1] Output terminal, copper wire temperature class (UL approval):
min. 75°C @ Ta < 50°C / min. 90°C @ Ta ≥ 50°C.
5-pin 7/8" receptacle female with internal threads.
To tighten the mating connector use Murrelektronik 7/8" 1.5 Nm torque wrench set AF 22:
Art. No.: 7000-99104-0000000 with correct 7/8" wrench.



[2] Input terminal, copper wire temperature class (UL approval):
min. 75°C @ Ta < 50°C / min. 90°C @ Ta ≥ 50°C.
3-pin 7/8" receptacle male with external threads.
To tighten the mating connector use Murrelektronik 7/8" 1.5 Nm torque wrench set AF 22:
Art. No.: 7000-99104-0000000 with correct 7/8" wrench.



[3] Bi-colour LED, output voltage “OK” - green, Alarm - red.
- led can be red due to over temperature, short circuit or over load.
[5] High efficiency with partial load / Ⓐ minimum losses with no-load.
[6] Temperature derating curve.

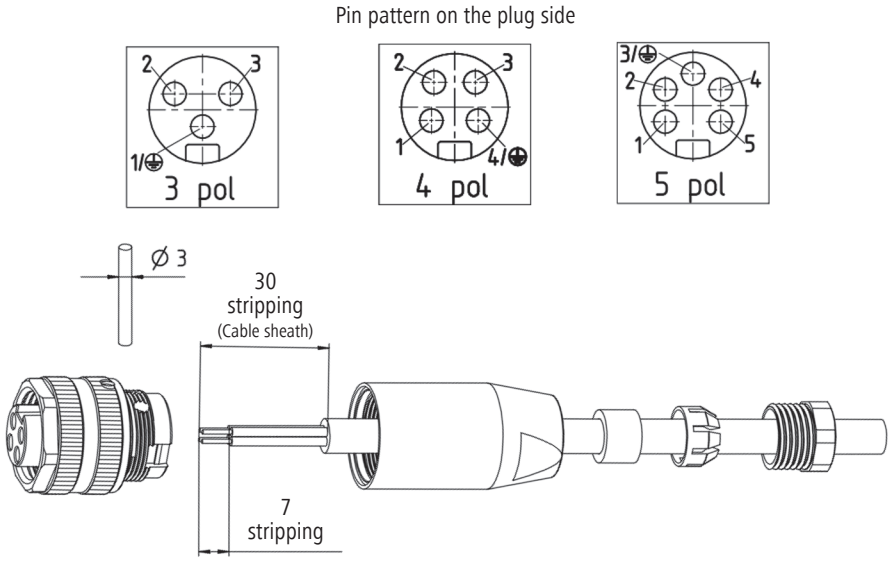


Fig. 12 Prepare the power supply cable/plug

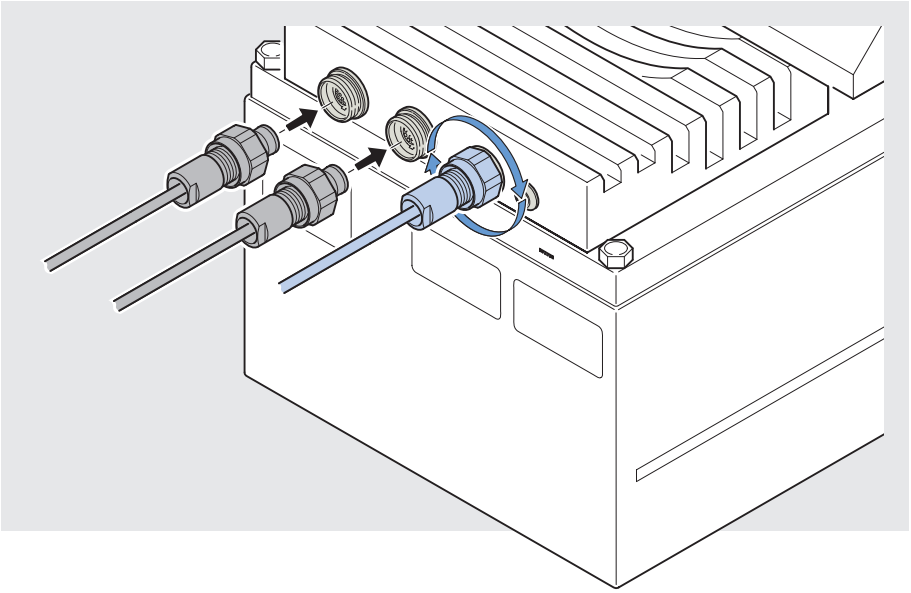


Fig. 13 Mount and secure the connectors

3.2 Inline installation – Option 2: Installing a power cable

If a 24 V DC (SELV) protective low-voltage source is available in the immediate vicinity of the prospective location of the Corona system, it can be used to power the **Corona extreme** or **Corona process**.

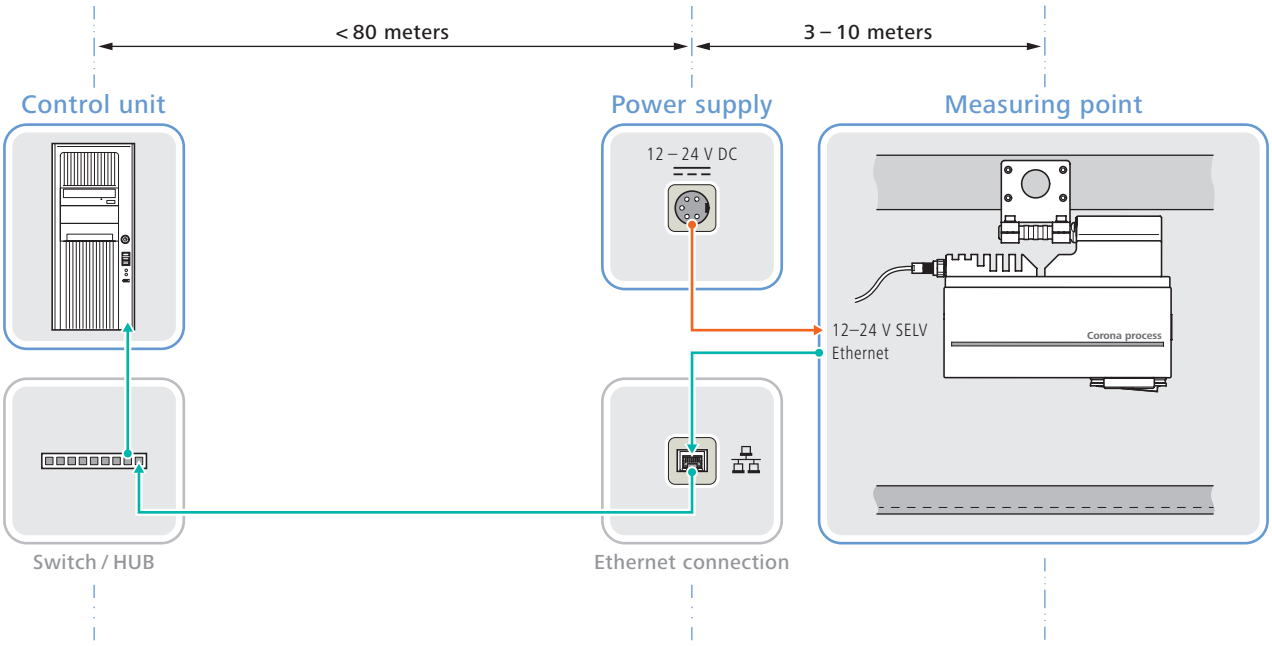


Fig. 14 Installation diagram – Power supply (shown in red) via protective low-voltage source (SELV)

Check the current connection conditions.
The following values must be observed:

Power supply voltage	12 – 24 V ⎓ SELV (safety extra-low voltage)
Power consumption	35 W
Inrush current	< 4 A
Cable specifications	max. 15 m, 1.5 mm², 24 V

Tab. 3 Power connections

3.3 Laboratory operation

In a laboratory or similar environment, the ZEISS laboratory power supply unit must be used to power the **Corona extreme** or **Corona process**.

- Laboratory power supply unit (000000-2045-548)

This laboratory power supply unit is only designed for use in laboratory-like environments (IP22) and must not be used in inline installations.

If the **Corona extreme** or **Corona process** is used in combination with **TURNSTEP ST**, only one laboratory power supply unit is necessary! As soon as the **TURNSTEP ST** is switched on, it supplies the Corona system with power.

An example of Corona extreme and TURNSTEP ST is shown below:

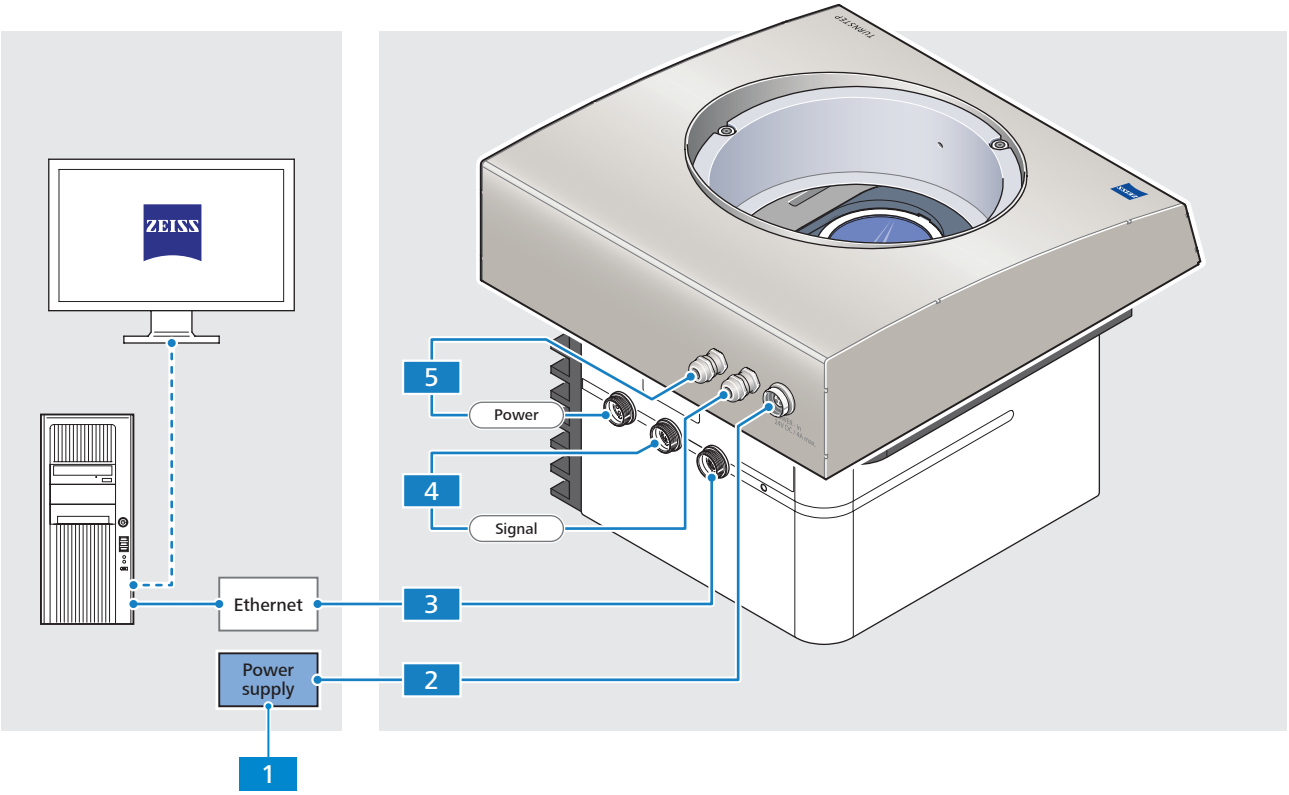


Fig. 15 Power supplied via laboratory power supply unit and TURNSTEP ST

1 *Laboratory power supply unit (000000-2045-548)*
2 *Cable from laboratory power supply unit to TURNSTEP ST ("Power IN")*
3 *Ethernet cable from the Corona system to the Ethernet switch or PC*
4 *"Digital IN/OUT" cable from the Corona system to the TURNSTEP ST*
5 *Power supply cable from TURNSTEP ST ("Power OUT") to the Corona system ("POWER 24 V DC")*

4 Preparing the data interface

4.1 Ethernet cable

For communication between the **Corona extreme**/**Corona process** and a control unit, a connection must be made using the Ethernet cable supplied.

The Ethernet cable should be no longer than 80 m, otherwise a switch must be inserted.

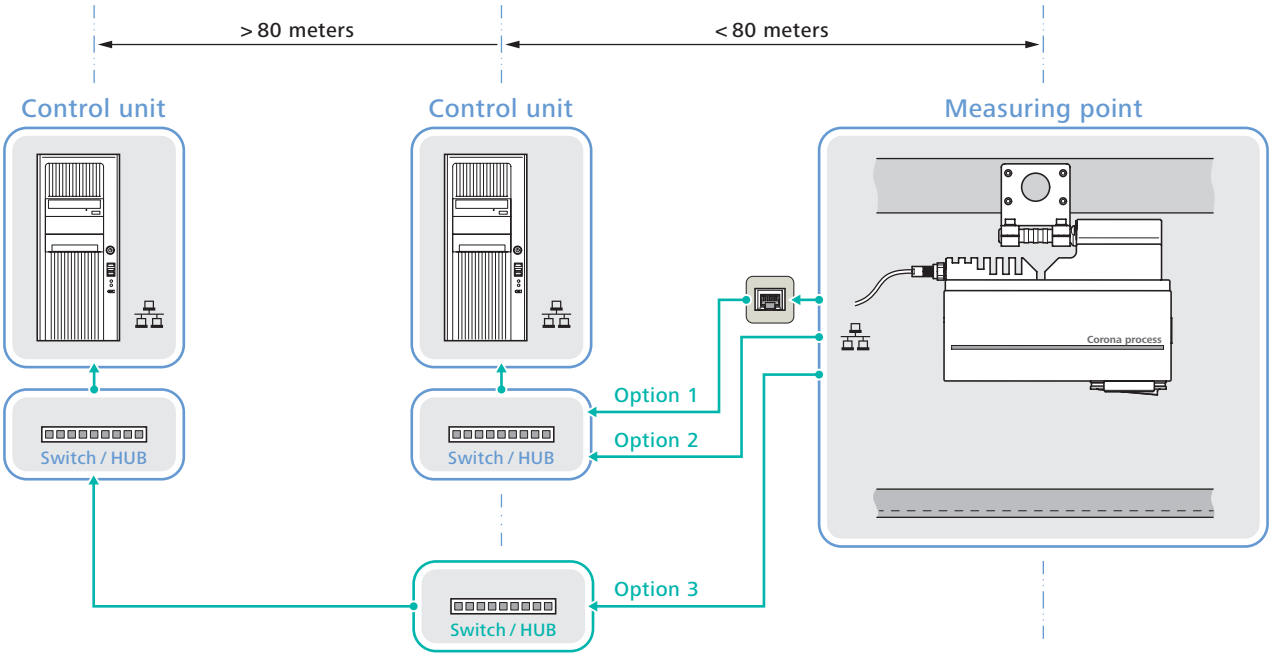


Fig. 16 Ethernet port

Ethernet cables that are not included in the scope of delivery but are required must comply with at least CAT 6.

Make sure that the Corona system is in the same IP address space as your PC or control unit. If necessary, change the IP address space of the Corona system, PC or control unit.

Note

To change the IP address of the Corona system, refer to "4.4 Change IP addresses" on page 28.

To prevent communication problems, the use of a second network card for the Corona systems and/or the establishment of V-LAN networks are recommended.

4.2 PC/Control unit

Minimum system requirements:

- Windows 10
- Processor Intel Core 2 Duo
- 2 GB RAM
- 1 GB of free memory (hard disk)
- Display resolution 1280 x 1024 pixels

Recommended system specifications:

- Windows 10
- Processor Intel Core i7
- 4 – 8 GB RAM
  (Note: As a 32-bit application, the InProcess software can only address 4GB)
- ≥ 128 GB SSD
- Display resolution 1280 x 1024 pixels

4.3 Software

4.3.1 Install InProcess software

The InProcess software CD-ROM or USB stick contains the configuration file and all the files necessary for installation.

Instructions

1 Start the installation by double-clicking the **setup.exe** file.

2 Select the location and agree to the license terms.

3 To start the installation process, click **INSTALL**.

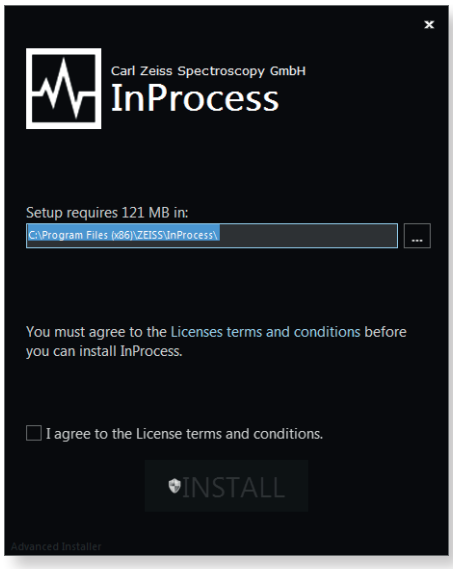


Fig. 17 Start window of the InProcess installation

4 Exit the installation process by clicking the **Finish** button.

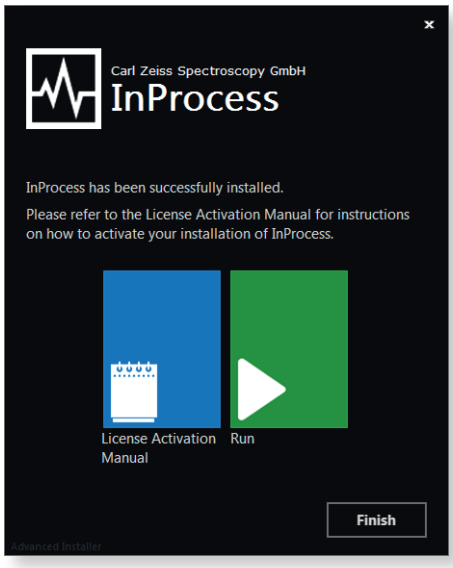


Fig. 18 Finishing the installation

4.3.2 Activate licenses

Once the InProcess software has been installed, activate the necessary licenses.

Note

Detailed information on activating the required licenses can be found in the "ZEISS License Activation Manual".

Once the licenses have been activated, the software can be started.

4.4 Change IP addresses

The default IP address of the ZEISS **Corona process** and **Corona extreme** sensors is 192.168.0.177.

If different IP addresses are required, e.g. for use in a company network, these can be adapted using the OSIS Management Console (OMC).

To change the IP address follow the instructions below.

A) Changing the IP address of the Corona system (see 4.4.1)

B) Changing the IP address in the system configuration (see 4.4.2)

Instructions

1 **Connect the device to the test computer and power supply**

Connect the device to the measurement computer using the Ethernet cable. The IP address is stored on an electronic component in the device. Ensure the availability of a reliable Ethernet connection before changing the IP address. Pinging the default IP address can provide information on the stability of the Ethernet communication.

Use a power supply unit to power the device.

2 **Open the OSIS software**

Start **OSISManagementConsole.exe** at:

Up to InProcess version 2.9:
⇒ C:\Program Files (x86)\ZEISS\InProcess\

InProcess version 2.10 or higher:
⇒ C:\Program Files (x86)\ZEISS\InProcess\OSIS\ManagementConsole\

Note: The software starts in read only mode if other ZEISS software applications such as InProcess are open. All other ZEISS applications must be closed in order to use the full functionality of the OSIS management console (OMC).

3 Select a device

The device to be configured must be included in the eq device list.
If the device is not listed, it can be selected from the template list.

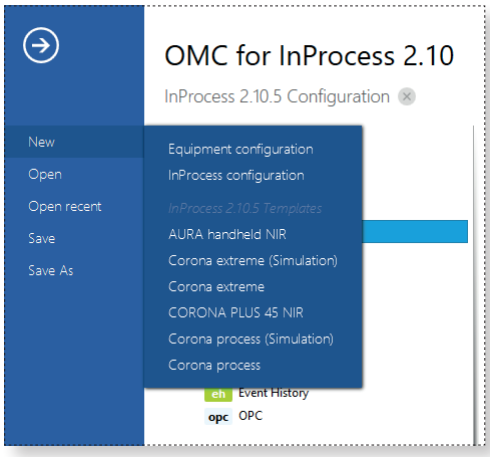


Fig. 19 List of device templates in the OSIS software

4.4.1 Changing the IP address of the Corona system

Instructions

1 Open the "Change IP address" context menu

Right-click dev (name of your device), and then select Change IP address ... .

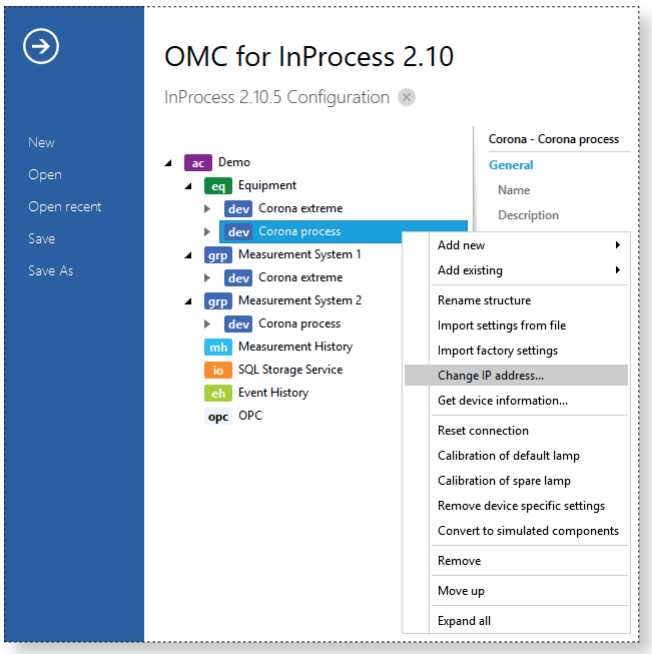


Fig. 20 Context menu for selecting a device in Equipment, showing Corona process as example

2 **Change the IP address**

Enter the new IP address in the following dialog.

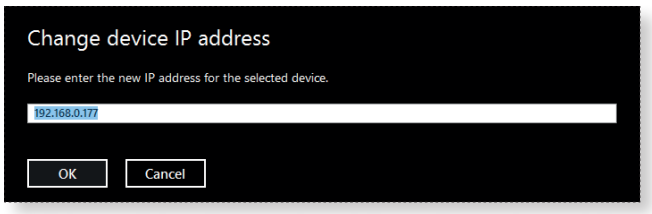


Fig. 21 Input field for saving the IP address

3 **Start the change procedure**

Clicking **OK** starts the change procedure and permanently saves the IP address entered in the electronics.

Successful completion of the procedure is confirmed in a separate window.

4.4.2 Changing the IP address in the system configuration

If the ZEISS sensor has an IP address other than the default, this must be entered in the system configuration.

Instructions

1 **Enter the IP address of the measuring system**

In **Hardware settings** > **IP address**, enter the IP address of your device.

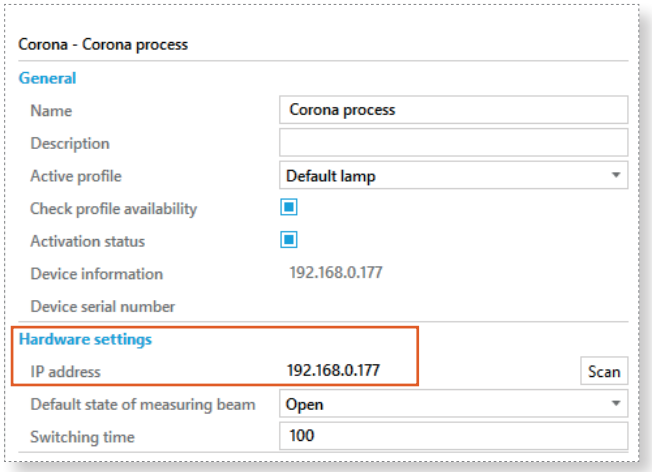


Fig. 22 Text field for entering the IP address in the system configuration

2 **Save system configuration as InProcess configuration**

To allow the software to apply the configuration with a changed IP address, click **Save as** and select **InProcess Configuration**.

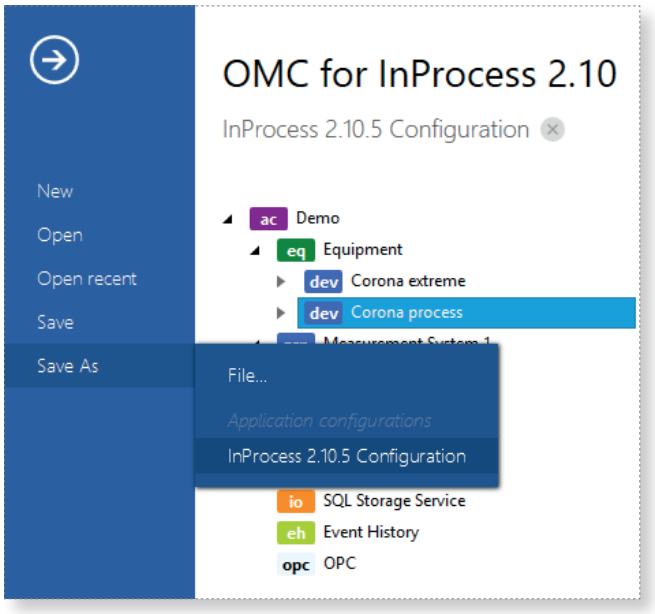


Fig. 23 Save the current configuration as an InProcess configuration

Make sure you are now working in the same IP address space.
You may need to adjust the IP address space on the computer.

Result The InProcess software can now successfully initialize the sensor with the customized IP address.