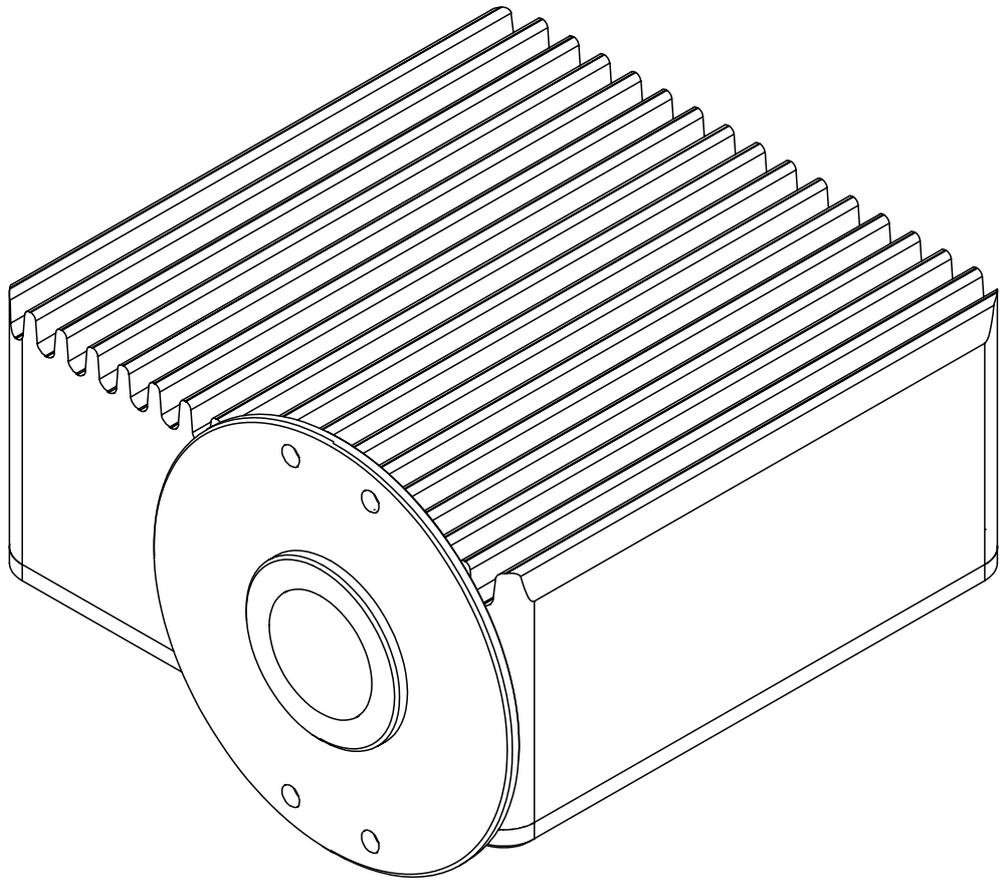




# X-Sential™

## Operation Manual



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NIR-Online GmbH  
Emil-Gumbel-Str. 1  
69126 Heidelberg  
E-mail: [info.nir-online@buchi.com](mailto:info.nir-online@buchi.com)

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# 1 About this document

This operation manual is applicable for all variants of the instrument. Read this operation manual before operating the instrument and follow the instructions to ensure safe and trouble-free operation.

Keep this operation manual for later use and pass it on to any subsequent user or owner.

NIR-Online GmbH accepts no liability for damage, faults and malfunctions resulting from not following this operation manual.

If you have any questions after reading this operation manual:

- ▶ Contact NIR-Online GmbH Customer Service.

service.nir-online@buchi.com

## 1.1 Mark-ups and symbols



### NOTE

This symbol draws attention to useful and important information.

- ☑ This character draws attention to a requirement that must be met before the instructions below are carried out.
- ▶ This character indicates an instruction that must be carried out by the user.
- ⇒ This character indicates the result of a correctly carried out instruction.

Mark-up	Explanation
<i>Window</i>	Software Windows are marked-up like this.
<i>Tab</i>	Tabs are marked-up like this.
<i>Dialog</i>	Dialogs are marked-up like this.
<i>[Button]</i>	Buttons are marked-up like this.
<i>[Field names]</i>	Field names are marked-up like this.
<i>[Menu / Menu item]</i>	Menus or menu items are marked-up like this.
<b>Status</b>	Status is marked-up like this.
<b>Signal</b>	Signals are marked-up like this.

## 2 Safety

### 2.1 Proper use

The sensor is used to analyze substances and samples in production and in the laboratory. The sensor is intended exclusively for that purpose.

The sensor can be used in laboratories and production facilities for the following operations:

- Quality control
- Process optimization
- Reference measurements

### 2.2 Use other than that intended

The use of the instrument other than described in proper use and specified in technical data is use other than that intended.

The operator is responsible for damages or hazards that are caused by use other than that intended.

Especially the following uses are not permitted:

Use of any other kind than that described in the section Chapter 2.1 "Proper use", page 6 and any application that does not comply with the technical specifications (see Chapter 3.6 "Technical data", page 13) constitutes use other than that intended.

In particular, the following applications are not permissible:

- Using the sensor in areas for which the sensors are not certified. For certification details see Chapter 3.5 "ATEX rating", page 13.
- Use of the sensor in potentially explosive atmospheres without an overall assessment by the responsibility holder.
- Use of a sensor of which the screw sealing cap is damaged.

Damage or hazards attributable to use of the product other than as intended are entirely at the risk of the operator alone.

### 2.3 Warning notices in this document

Warning notices warn you of dangers that can occur when handling the instrument. There are four danger levels, each identifiable by the signal word used.

<b>Signal word</b>	<b>Meaning</b>
DANGER	Indicates a danger with a high level of risk which could result in death or serious injury if not prevented.
WARNING	Indicates a danger with a medium level of risk which could result in death or serious injury if not prevented.
CAUTION	Indicates a danger with a low level of risk which could result in minor or medium-severity injury if not prevented.
NOTICE	Indicates a danger that could result in damage to property.

## 2.4 Warning and directive symbols

The following warning and directive symbols are displayed in this operation manual or on the instrument.

Symbol	Meaning
	General warning
	Dangerous electrical voltage
	Material damage
	Explosive substances
	Read manual

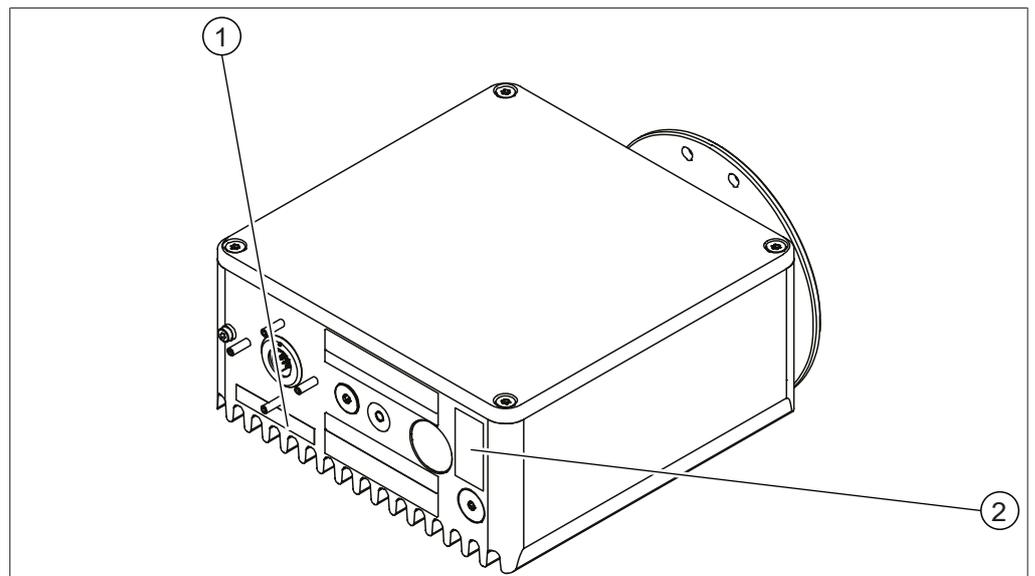


Fig. 1: Location of safety notices and warning signs on the instrument

1



General warning

**Clean Unit when dust exceeds  
5 mm thickness**

2



General warning

**Do not separate when ener-  
gized  
Do not open in hazardous area.**

## 2.5 Residual risks

The instrument has been developed and manufactured using the latest technological advances. Nevertheless, risks to persons, property or the environment can arise if the instrument is used incorrectly.

Appropriate warnings in this manual serve to alert the user to these residual dangers.

### 2.5.1 Risk of explosion from opening up the sensor

Opening up the sensor in potentially explosive atmospheres can cause an explosion.

- ▶ Do not open up the sensor housing.

### 2.5.2 Risk of explosion from unplugging the device power plug

Risk of explosion from unplugging the device power plug when the power is switched on.

- ▶ Do not unplug the sensor when the power is switched on.

## 2.6 Staff qualification

Unqualified persons are unable to identify risks and are therefore exposed to greater dangers.

The device may only be operated by suitably qualified persons.

These operating instructions are aimed at the following target groups:

### Users

Users are persons that meet the following criteria:

- They have been instructed in the use of the device.
- They are familiar with the contents of these operating instructions and the applicable safety regulations and apply them.
- They are able on the basis of their training or professional experience to assess the risks associated with the use of the device.

### Operator

The operator is responsible for the following aspects:

- The instrument must be correctly installed, commissioned, operated and serviced.
- Only suitably qualified staff may be assigned the task of performing the operations described in these operating instructions.
- The staff must comply with the locally applicable requirements and regulations for safe and hazard-conscious working practices.
- Safety-related incidents that occur while operating the instrument are to be reported to the manufacturer.  
service.nir-online@buch.com

### NIR-Online service technicians

Service technicians authorized by NIR-Online have attended special training courses and are authorized by NIR-Online GmbH to carry out special servicing and repair measures.

## 2.7 Personal protective equipment (production)

Follow the rules regarding personal protective equipment that are applicable at the installation site.

The operation of the sensor does not require additional protective equipment.

## 2.8 Personal protective equipment (laboratory)

Depending on the application, hazards due to heat and/or corrosive chemicals may arise.

- ▶ Always wear appropriate personal protective equipment such as safety goggles, protective clothing and gloves.
- ▶ Make sure that the personal protective equipment meets the requirements of the safety data sheets for all chemicals used.

## 2.9 Modifications

Unauthorized modifications may impair safety and lead to accidents.

- ▶ Use only genuine NIR-Online accessories, spare parts and consumables.
- ▶ Technical modifications to the instrument or accessories should only be carried out with the prior written approval of NIR-Online GmbH and only by authorized NIR-Online service technicians.

NIR-Online GmbH accepts no liability whatsoever for damage arising as a result of unauthorized modifications.

## 3 Product description

### 3.1 Description of function

The sensor is an optical instrument for nondestructive determination of substances and concentrations in a sample.

A sample absorbs and reflects light across the entire wavelength spectrum according to its color and chemical composition. The signal reflected by the sample is recorded and analyzed by a spectrometer.

- The sensor uses a lamp to produce near-infrared radiation that interacts with the molecules of the sample. The interaction between sample and light produces a characteristic spectrum.
- The light reflected from the sample is collected through two sets of fiber optics that direct the light to the NIR and visible spectrophotometers, respectively. The visible spectrophotometer consists of a diffraction grating to spatially disperse the light according to wavelength and a silicon photodiode array containing multiple elements which measure the light intensity for specific wavelength intervals. The NIR spectrophotometer consists of a diffraction grating to spatially disperse the light according to wavelength and an indium-gallium-arsenide photodiode array containing multiple elements.
- The produced measurement results are converted to data sequences.
- The data sequences are transferred to a computer via an interface.
- A computer program compares the data sequence curve with a calibration model and in that way determines the chemical composition of the sample.

### 3.2 Configuration

#### 3.2.1 Front view

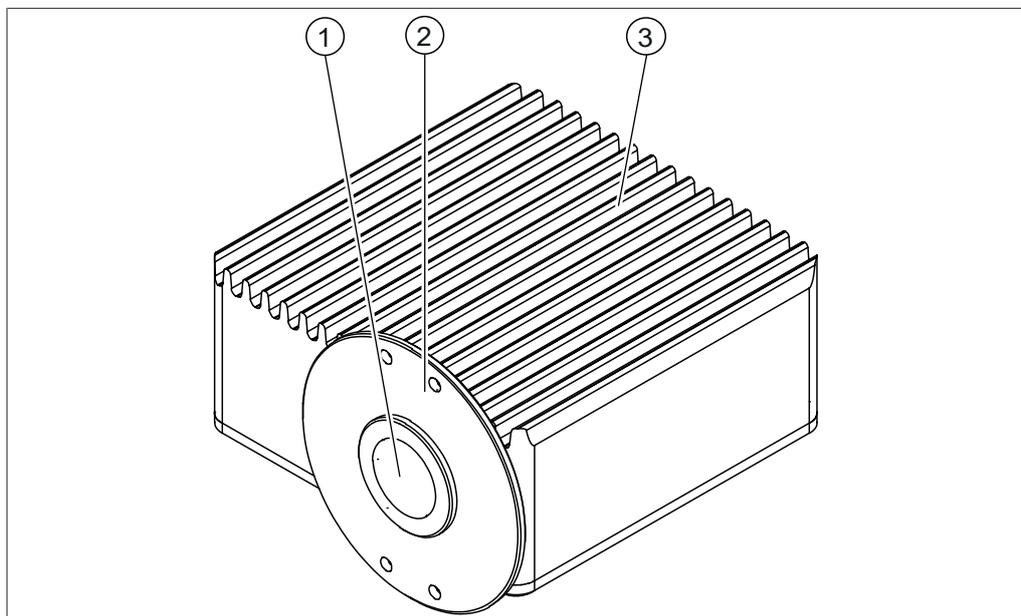


Fig. 2: Front View

- |   |                    |   |        |
|---|--------------------|---|--------|
| 1 | Measurement window | 2 | Flange |
| 3 | Heat sink          |   |        |

### 3.2.2 Rear view

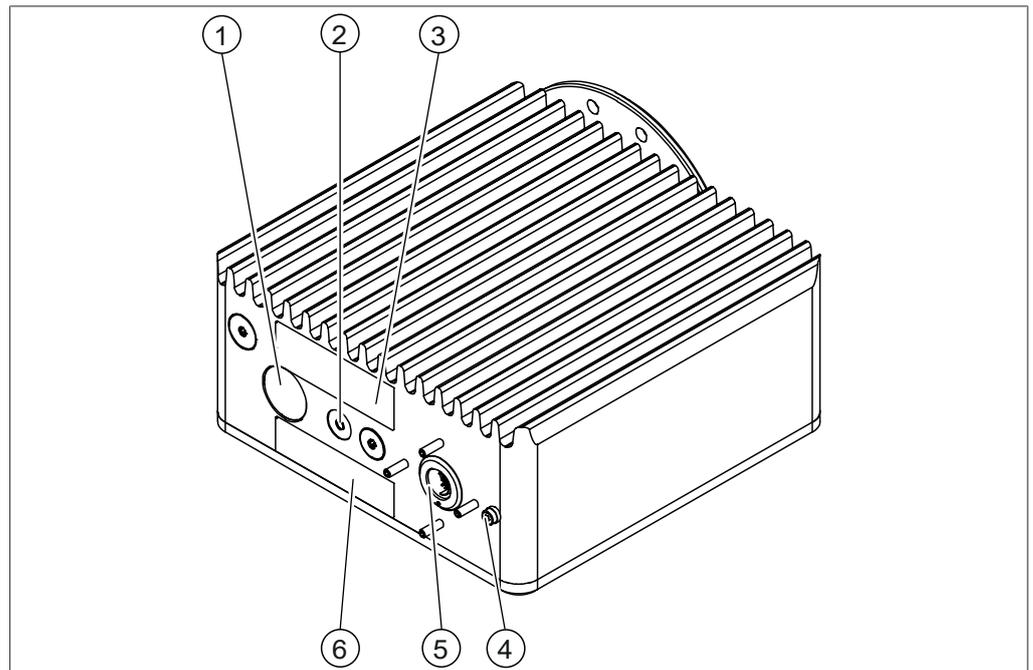


Fig. 3: Rear view

- |   |                            |   |  |
|---|----------------------------|---|--|
| 1 | Journal Button             | 2 | Power and scanning indicator light           |
| 3 | Type plate (part)          | 4 | Ground connection<br>(Equipotential bonding) |
| 5 | Power and signal connector | 6 | Type plate (part)                            |

### 3.3 Scope of delivery



#### NOTE

The scope of delivery depends on the configuration of the purchase order.

Accessories are delivered as per the purchase order, order confirmation, and delivery note.

### 3.4 Type plate



**NOTE**  
Labeling

Instruments without mark.

- ▶ Instruments without ATEX mark are not suitable for ATEX operation. See Chapter 3.5 "ATEX rating", page 13

The type plate identifies the instrument. See Chapter 3.2.2 "Rear view", page 11

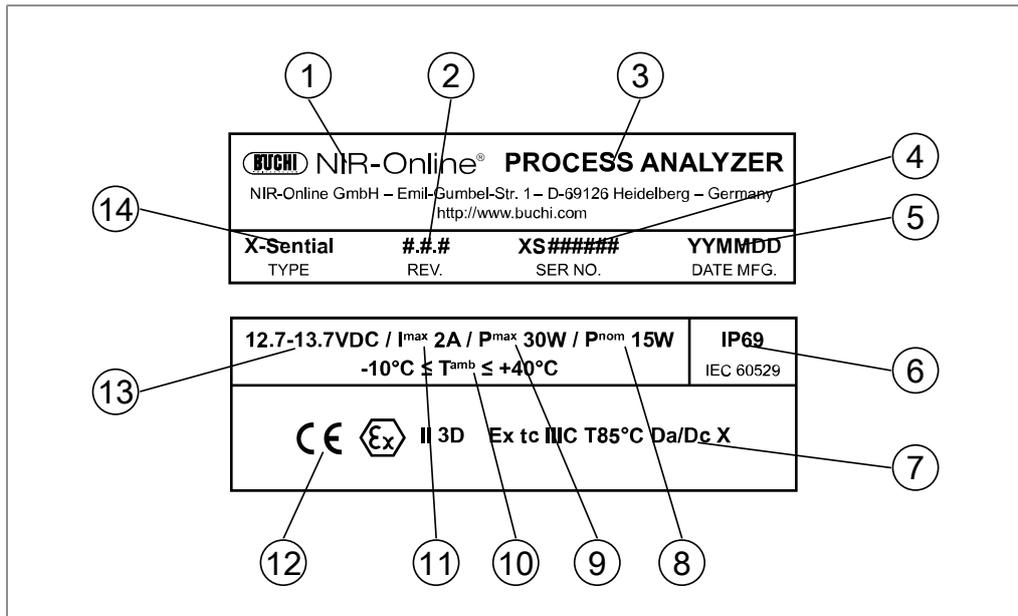


Fig. 4: Type plate

- |                               |                               |
|-------------------------------|-------------------------------|
| 1 Company name and address    | 2 Revision number             |
| 3 Product name                | 4 Serial number               |
| 5 Production date             | 6 IP class                    |
| 7 ATEX information            | 8 Power consumption (nominal) |
| 9 Power consumption (maximum) | 10 Ambient temperature        |
| 11 Current draw (maximum)     | 12 Certificates               |
| 13 Operating voltage          | 14 Product type               |

The following product options are possible:

Letter	Option
A	NIR
D	VIS
E	Gold reflector (X-One)
G	Lamp position rev. 1.3.2
N	System temperature 0 - 80 °C
O	Humidity sensor 0-100% RH

Letter	Option
S	X-Quvette (Fiber lens (approx. 0 - 2 cm))
V	External button
X2	X-Beam 002 (approx. 15 cm measurement distance)

### 3.5 ATEX rating

The sensor is certified according to the following European Union ATEX Directive ratings:

II      3D      Ex      tc      IIIC      T85°C      Da/Dc      X

#### Meaning of the rating marks:

Rating	Meaning according to Directive 2014/34/EU
II	Device group approved for all Ex zones except mining
3D	Device category approved for dust zone 22
Ex	Explosion-safe
tc	Protection class protected by enclosure
IIIC	Dust group conductive dusts
T85 °C	Temperature classification max. surface temperature = 85° C
Da/Dc	Device safety level. Da -zone 20, adequate safety in event of rare faults; Dc - zone 22, adequate safety in regular operation
X	Specific conditions

### 3.6 Technical data

#### 3.6.1 Sensor

Specifications	X-Sential
Dimensions (W x D x H)	200 x 200 x 100 mm
Weight	5 kg
Max. operating pressure	30 bar at flange
Product temperature (temperature at flange with water cooling)	-10 °C to +130 °C
Product temperature (temperature at flange without water cooling)	-10 °C to + 70 °C
Vibrations	0.2 G at 0.1 - 150 Hz
Wavelength spectrum NIR range	900 - 1700 nm; 11100 - 5880 cm <sup>-1</sup>
Wavelength spectrum Visible range	350 - 900 nm; 28500 - 11100 cm <sup>-1</sup>
Number of pixels NIR	128
Number of pixels VIS	256
Detector	Diode array
Average measurement time	20 spectra/s

<b>Specifications</b>	<b>X-Sential</b>
IP Code	IP69 / IPX9K
Type of lamp	Tungsten-halogen dual lamp
Lifetime lamp	18000 h (2 x 9000 h)
Minimum clearance on all sides	100 mm
Connection Voltage	85 to 264 VAC
Frequency	50/60 Hz
Power consumption	30 W
Temperature stabilization	ASDC (Advanced Spectral Drift Control): active temperature control to $\pm 1^\circ\text{C}$ from set system operating temperature. Deviations will lead to automatic white reference measurement to account for spectral drifts.
ATEX	Dust: II 3D Ex tc IIIC T85°C Da/Dc X

### 3.6.2 Installation box

Specifications	Installation box
Dimensions (W x D x H)	300 x 300 x 167 mm
Weight (excluding cables)	6 kg
Weight (inc. cables, 2 x 10 m)	7.4 kg
Frequency	50/60 Hz
Power consumption	30 W
Power supply	85 - 264 VAC

### 3.6.3 Ambient conditions

Ambient temperature  $-10\text{ °C} \leq T_{amb} \leq +40\text{ °C}$

Max. relative air humidity < 90 % non-condensing

Storage temperature max. 45 °C

### 3.6.4 Materials

Component	Materials of construction
Casing	Aluminium (nickel coated), SS 316L 1.4404 flange
Seals	NBR (standard sealing material) FFKM (optional)

### 3.6.5 Software

The sensor is controlled via the SX-Suite software package. It consists of the following components:

Name	Description	Typical usage	User	Occurrence
SX-Server	Instrument driver / usage of special functions	Read out instrument status	Operator	As required
		Setup of instrument hardware	NIR admin	For installation and maintenance

Name	Special function	Description	User	Occurrence
SX-Server	Conveyor belt	Optimized for measurement of moving objects on a conveyor belt	NIR admin	As required
	Mix	Control end-point of mixing processes	NIR admin	As required
	Sample movement detection	Verify sample flow	NIR admin	As required

Name	Description	Typical usage	User	Occurrence
SX-Center	User interface (online/lab mode)	Recipe/product and calibration management View results (table, trend, charts, reports) Reference data management	Operator	Daily workflow (if not fully automated)
SX-Backup	Data backup scheduler	Automated backup of measurement data, results and calibrations	NIR admin	During installation

### 3.6.6 Computer system requirements

The system requirements for the computer are as follows:

Operating system	Windows 10 Pro
Central processing unit	Intel Core i5 generation 6600 or later
RAM	At least 4 GB
Hard disk space	At least 80 GB free disk space Use a hard disk suitable for continuous operation.
Data backup	At least 0.5 GB free disk space
Network or external hard disk	Additional 20 MB per day and sensor disk

Screen resolution	At least 1280x1024
LAN	At least 1 x 100 Mbit/s LAN
USB 2.0/3.0	At least 1 USB connection per sensor and 1x USB per DataLab I/O box
PCI/PCIe	1 slot for Profibus card (for Profibus connection)
Software	Word and Microsoft Excel 2003 or later

### 3.6.7 Installation site (laboratory)

- The installation site has a firm, level surface.
- The installation site meets the safety requirements. See Chapter 2 "Safety", page 6
- The installation site has enough space that cables can be routed safely.
- The installation site has no obstacles (e.g. water taps, drains, etc.).
- The installation site has an own mains outlet socket for the instrument.
- The installation site is not exposed to external thermal loads, such as direct solar radiation.
- The installation site allows that the power supply can be disconnected at any time in an emergency.
- The installation site meets the specifications according to the technical data (e.g. weight, dimension, etc.). See Chapter 3.6 "Technical data", page 13

### 3.6.8 Installation site (production)

- The installation site has a firm, level surface.
- The installation site meets the safety requirements. See Chapter 2 "Safety", page 6
- The installation site has enough space that cables can be routed safely.
- The installation site is not exposed to external thermal loads, such as direct solar radiation.
- The installation site meets the specifications according to the technical data (e.g. weight, dimension, etc.). See Chapter 3.6 "Technical data", page 13
- The installation site meets the specifications according to the installation point. See Chapter 5.1 "Establishing installation point", page 19
- The installation site has a own mains outlet socket for the instrument.
- The installation site has a sample removal point at a distance of < 1 m.
- The installation site allows a direct product measurement.
- The installation site has constant product flow.
- The layer thickness of the product to be measured is at least 30 mm.

## 4 Transport and storage

### 4.1 Transport



#### NOTICE

##### Risk of breakage due to incorrect transportation

- ▶ Make sure that all parts of the instrument are safely packed in such a way as to prevent breakage, ideally in the original box.
  - ▶ Avoid sharp movements during transit.
- 
- ▶ After transportation, check the instrument for damage.
  - ▶ Damage that has occurred in transit should be reported to the carrier.
  - ▶ Keep packing for future transportation.

### 4.2 Storage

- ▶ Make sure that the ambient conditions are complied with (see Chapter 3.6 "Technical data", page 13).
- ▶ Wherever possible, store the device in its original packaging.
- ▶ After storage, check the device for damage and replace if necessary.

## 5 Installation

### 5.1 Establishing installation point

The fixing points or bolts conform to M6 A2-70/7.3 Nm.

Establish the installation point according to the specified data of the flange.

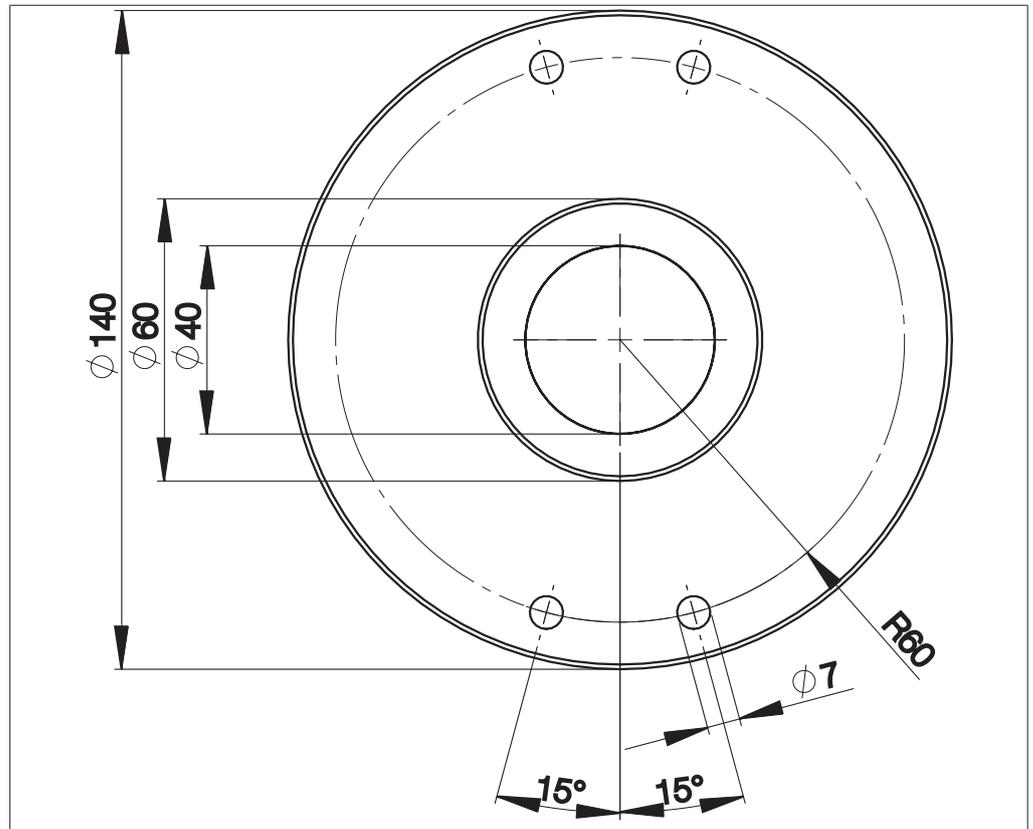


Fig. 5: Dimensions of flange

## 5.2 Installation point in piping system (example)

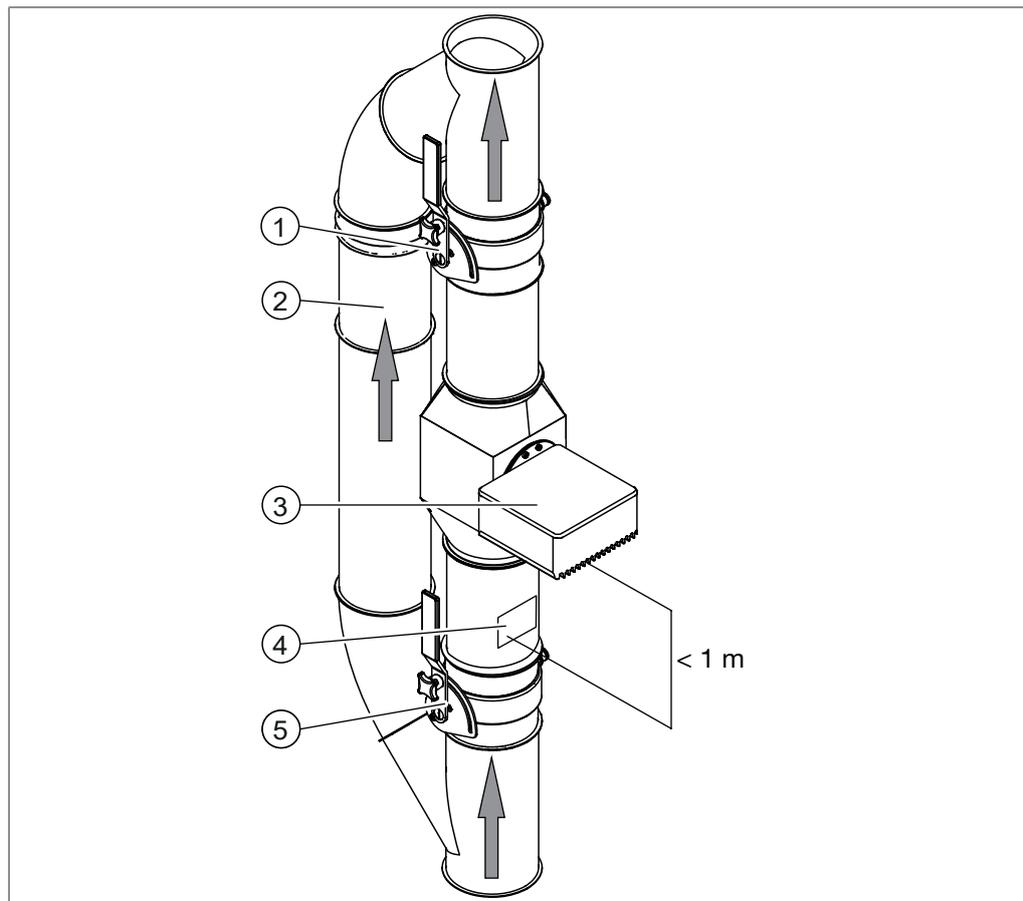
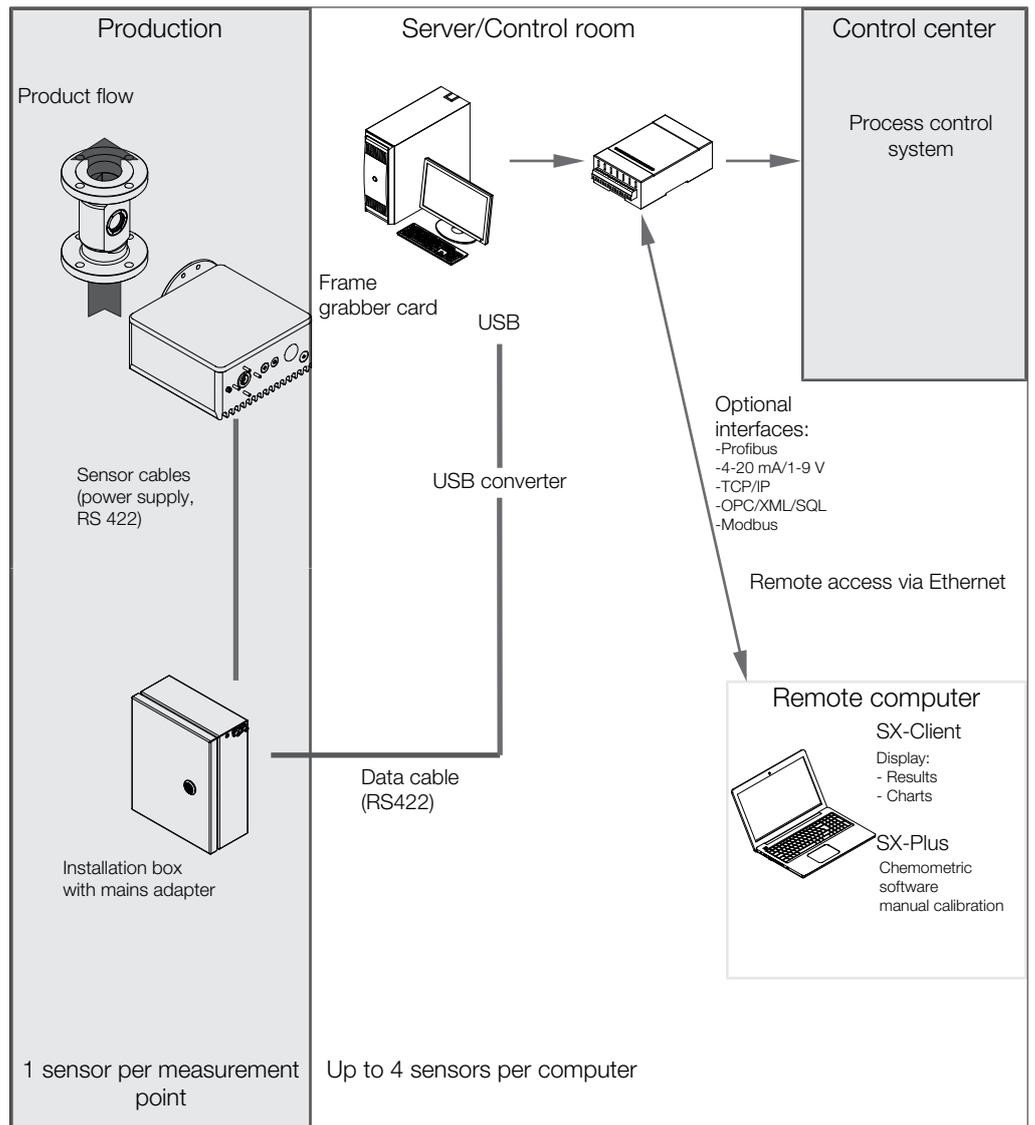


Fig. 6: Configuration

- |   |                 |   |                      |
|---|-----------------|---|----------------------|
| 1 | Flow restrictor | 2 | Bypass               |
| 3 | Analyser        | 4 | Sample removal point |
| 5 | Flow restrictor |   |                      |

### 5.3 Installation (example)



## 5.4 Sensor installation



### **⚠ DANGER**

#### **Use of an unsuitable flange in potentially explosive atmospheres.**

The use of an unsuitable flange may cause an explosion.

- ▶ In potentially explosive atmospheres use a double flange.

The following installation positions are possible:

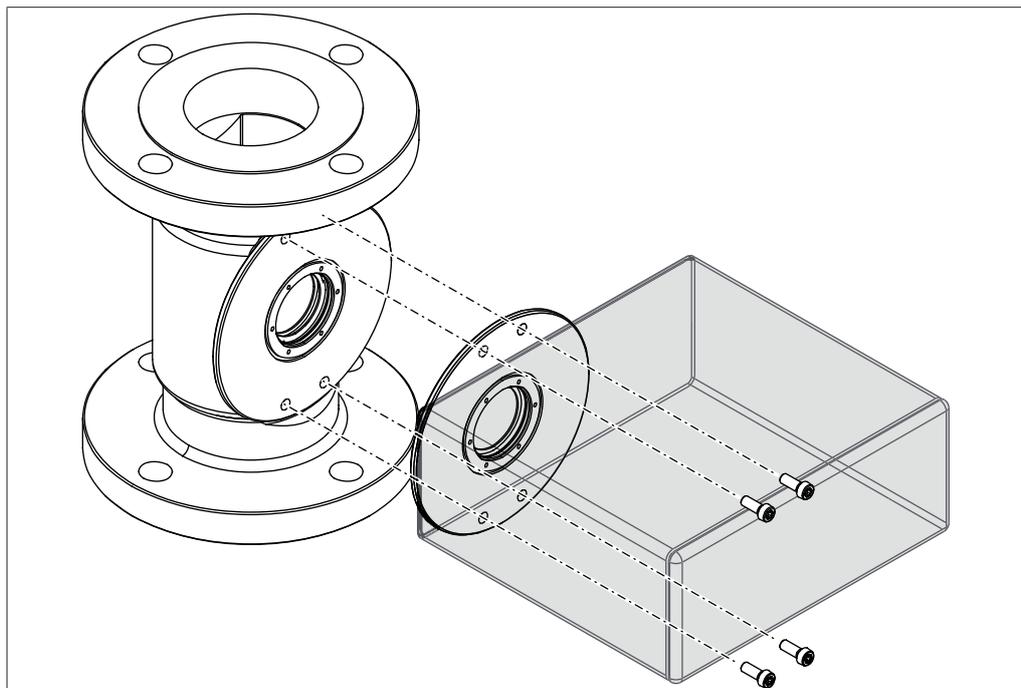
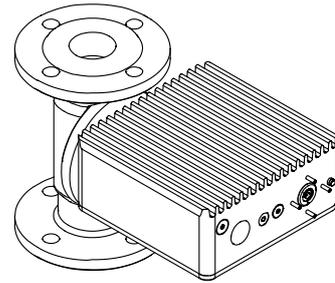
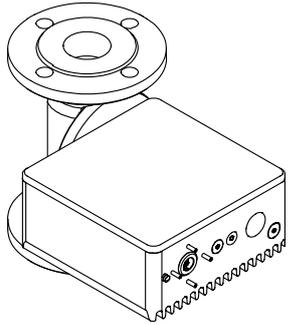


Fig. 7: Fixing sensor with screws

Tools required:

- Torque wrench, size Torx T30

Tightening torque: 8.4 Nm +-1

Precondition:

- Installation point has been established. See Chapter 5.1 "Establishing installation point", page 19.
- The fixing points or bolts conform to M6 A2-70 15 mm
- ▶ Fix the sensor to the installation point using the bolts.

## 5.5 Connecting the sensor

Tools required:

- Torque wrench, size 7 mm AF
- Torque wrench, size Torx T20



### NOTE

Make sure that the power is not switched on when connecting the sensor.

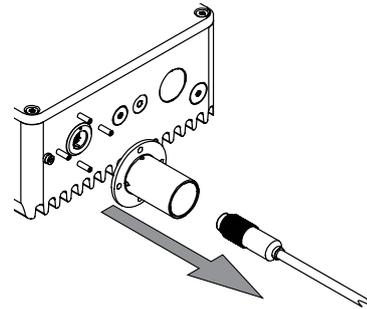


### NOTE

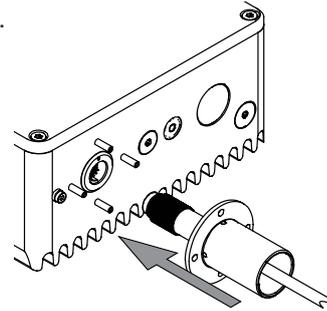
Loss of performance due to use of unsuitable device cables

Max. cable length between installation box and sensor 10 m.

- ▶ Put the cable guard over the sensor cable.

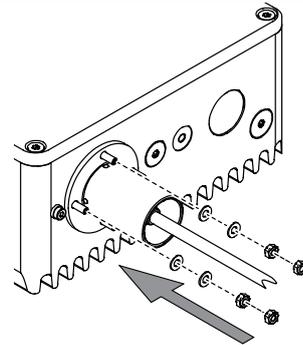


- ▶ Connect the sensor cable to the sensor.
- ▶ Secure the connector.



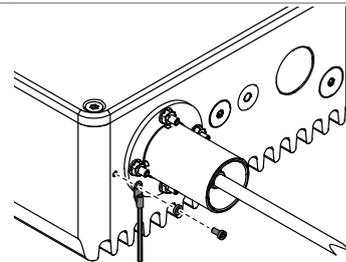
Tightening torque:  $2.5 \text{ Nm} \pm 0.5$

- ▶ Attach the cable guard to the sensor.



Tightening torque:  $2 \text{ Nm} \pm 0.5$

- ▶ Attach the ground cable to the sensor.



## 5.6 Establishing electrical connections



### NOTICE

#### **Risk of instrument damage because of not suitable power supply cables.**

Not suitable power supply cables can cause bad performance or an instrument damage

- ▶ Use only BUCHI power supply cables.

Precondition:

- The electrical installation is as specified on the type plate.
- The electrical installation is equipped with a proper grounding system.
- The electrical installation is equipped with suitable fuses and electrical safety features.
- The installation site is as specified in the technical data. See Chapter 3.6 "Technical data", page 13
- ▶ Connect the power supply cable to the connection on the instrument. See Chapter 3.2 "Configuration", page 10
- ▶ Connect the mains plug to an own mains outlet socket.

## 6 Operation

The instrument is operated via the SX-Suite software on a computer. See *SX-Suite User Manual* and *SX-Plus User Manual*.

### 6.1 Journal button

Pressing the button generates a journal entry.

### 6.2 Entering reference data in the journal

To perform a calibration and continuously check the calibration, reference data is required.

Continuous checking of the calibration is performed according to the requirements of the production process.



#### NOTE

The journal entry is identified by date and time.

- ▶ Press and hold the journal button for one second.
  - ⇒ The connected software creates a journal entry.
- ▶ Remove the sample at the sample removal point.
- ▶ Mark sample with date, time and sensor number.
- ▶ Carry out a laboratory analysis.
- ▶ Insert the reference data in the journal for creating the calibration model. See *SX-Suite User Manual* and *SX-Plus User Manual*

## 7 Cleaning and servicing



### NOTE

Users may only carry out the servicing and cleaning operations described in this section.

Any servicing and repair work which involves opening up the casing may only be carried out by NIR-Online service technicians.

- ▶ Use only genuine NIR-Online consumables and spare parts in order to ensure correct operation of the device and preserve the warranty.

### 7.1 Notes on servicing



#### NOTICE

##### Risk of property damage due to failure to remove dust from heat sink

If dust is not cleaned off the heat sink it may cause the sensor to fail.

- ▶ Make sure that the layer of dust is no thicker than 5 mm.

### 7.2 Regular maintenance work

Component	Action	Interval
Casing	▶ Wipe down the casing with a damp cloth.	Weekly
Warning symbols	▶ Check that the warning symbols on the sensor are legible. ▶ If they are dirty, clean them.	Weekly
Optics	<b>NOTICE! Have operation carried out by NIR-Online service technician</b> ▶ Replace lamps.	Annually
Casing	<b>NOTICE! Have operation carried out by NIR-Online service technician</b> ▶ Check and replace seals	Annually

## 8 Taking out of service and disposal

### 8.1 Disposal

The operator is responsible for proper disposal of the instrument.

- ▶ When disposing the equipment observe the local regulations and statutory requirements regarding waste disposal.
- ▶ When disposing, observe the disposal regulations of the materials used. For the used materials see Chapter 3.6 "Technical data", page 13.

### 8.2 Returning the instrument

Before returning the instrument, contact the NIR-Online GmbH Service Department. [service.nir-online@buchi.com](mailto:service.nir-online@buchi.com) and ask for an RMA number.

## 9 Appendix

### 9.1 Certificates

#### 9.1.1 ATEX certificate



##### NOTE

Labeling

Instruments without  mark.

- ▶ Instruments without ATEX mark are not suitable for ATEX operation. See Chapter 3.5 "ATEX rating", page 13

### 9.2 Spare parts and accessories



##### NOTE

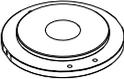
Any modifications of spare parts or assemblies are only allowed with the prior written permission of NIR-Online GmbH.

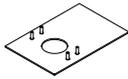
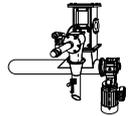
#### 9.2.1 Accessories

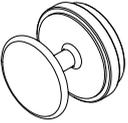
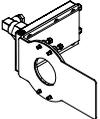
	<b>Order no.</b>
USB-RS422 interface	11060741
Analog interface (DataLabIO)	11060742
Profibus card PCI, High Profile	11060743
Profibus card PCI Express, High Profile	11063000
Profibus card PCI Express, Low Profile	11063001
Siemens LOGO!Power Power Supply 12,7 V	11063076

#### 9.2.2 Mounting accessories

Mounting accessories are hardware interfaces between the instrument and the process. Depending on the setup, specific mounting accessories might be needed for an implementation into the production facility.

	Order no.	Image
<p><b>Weld-in Flange</b></p> <p>Provides the ability to remove instrument while keeping the process sealed.</p> <p>Flange with sapphire window and purge port.</p> <ul style="list-style-type: none"> <li>• Adapter plate, <math>\varnothing 140/106</math> mm, for wall thickness up to 8,5 mm</li> <li>• Material: Stainless steel DIN 1.4404 (SST316L) / DIN 1.4571 (SST316Ti)</li> <li>• Sealing material FFKM White G74S, FDA compliant 15°C (+59°F) to 260°C (+500°F)</li> <li>• Operating pressure -0.5 to 30 bar. Max. pressure 100 bar short term</li> <li>• Purge port M5 (<math>\varnothing 4</math>mm tube adapter needed) to prevent condensation or detect leakage</li> <li>• High grade sapphire crystal optical lens, polished for reduced adhesion</li> <li>• Dead volume max. 60 mm<sup>3</sup></li> </ul>	11060754	
<p><b>Weld-in Flange Pipe</b></p> <p>Flange with sapphire window and purge port for installation in pipes or bended surfaces.</p> <ul style="list-style-type: none"> <li>• Outer diameter: 140 mm.</li> <li>• Material: Stainless steel DIN 1.4404 (SST316L)</li> <li>• Sealing material: FFKM White G74S</li> <li>• Operating pressure: -0.5 to 30bar. Max. pressure 100 bar short term</li> <li>• Purge port M5 (<math>\varnothing 4</math>mm tube adapter needed) to prevent condensation or detect leakage</li> <li>• The pipe diameter has to be specified upon order</li> </ul>	11068800	
<p><b>Weld-in Flange Hopper</b></p> <p>Flange with sapphire window and purge port for installation in hopper or bended surfaces with different diameters.</p> <ul style="list-style-type: none"> <li>• Outer diameter: 140 mm</li> <li>• Material: Stainless steel DIN 1.4404 (SST316L)</li> <li>• Sealing material: FFKM White G74S</li> <li>• Operating pressure: -0.5 to 30bar. Max. pressure 100 bar short term</li> <li>• Purge port M5 (<math>\varnothing 4</math>mm tube adapter needed) to prevent condensation or detect leakage</li> <li>• The upper and lower hopper diameter has to be specified upon order</li> </ul>	11068801	

	Order no.	Image
<p>Weld-in Plate</p> <p>For instruments in direct contact with the product.</p> <p>Plate with opening, fitting to instrument flange.</p> <ul style="list-style-type: none"> <li>• Dimensions: 160 x 241 x 3 mm</li> <li>• Material: DIN 1.4301 (SST304)</li> <li>• Thread bolts M6</li> </ul>	11060753	
<p>Bypass Sampler</p> <p>For free flowing goods (mealy / grainy).</p> <p>Bypass with feeder and sampling point.</p> <ul style="list-style-type: none"> <li>• Pneumatic sampler (min. 5 bar / 72.5 psi water or oil free compressed air DIN ISO 8573 Class 1)</li> <li>• Screw-conveyor (feeding capacity 1.5 t/h)</li> <li>• Motor (380V/50Hz ATEX A22 0.25 KW)</li> <li>• Requires bypass-installation box and a DataLab IO device</li> </ul>	11061670	
<p>X-Square</p> <p>For all free flowing powders and granulates.</p> <p>The X-Square can be inserted in the product stream or bypass.</p> <ul style="list-style-type: none"> <li>• Inspection panel (Plexiglas)</li> <li>• Adapted for Jacob pipes Ø150 mm</li> <li>• Stainless steel DIN 1.4301 electro polished</li> </ul>	11061669	
<p>X-Cell DN50, Standard Flange DN50, PL1, 10 bar</p> <p>For gas, liquid and paste-like products.</p> <p>The cell can be inserted in the product stream or bypass.</p> <ul style="list-style-type: none"> <li>• Material DIN 1.4404 (SST316L)</li> <li>• Sealing material: FFKM White G74S</li> <li>• Operating pressure up to 10 bar (145 psi). TÜV certificate upon request</li> <li>• Measurement slit 26 mm, configurable between 1 and 15 mm with additional adapter</li> <li>• DN 50 flange (other sizes upon request)</li> <li>• Clearance volume max. 120 mm<sup>3</sup> Cells can be customized with different diameter and flanges</li> </ul> <p>There are various dimensions of the X-Cell available in the pricelist.</p>	11063018	

	Order no.	Image
<p>X-Cell 4 Edge DN50</p> <p>For liquid and paste-like products.</p> <p>The cell can be inserted in the product stream or by-pass.</p> <ul style="list-style-type: none"> <li>• Material: DIN 1.4404 (SST316L)</li> <li>• Sealing material: FFKM White G74S</li> <li>• Operating pressure: max 3bar</li> <li>• Flange: DN50</li> <li>• Path length: 34mm</li> <li>• Typical use: Wine Applications</li> </ul>	11068822	
<p>VARINLINE Sensor Adapter Flange, Type N, 10bar</p> <p>For opaque products like powder or granules.</p> <p>In combination with a path length adapter also for transparent liquid, gel or pasty products.</p> <ul style="list-style-type: none"> <li>• Material DIN 1.4404 (SST316L)</li> <li>• Sealing material FFKM White G74S (FDA compliant), or custom</li> <li>• Operating pressure up to 10 bar (145 psi). TÜV certificate upon request</li> <li>• Build for DN50 DIN 32676, process connection type N</li> <li>• Product temp. -14 °C(+5 °F) to 230 °C (+446 °F)</li> <li>• Path length adapter configurable between 0,5 to 42 mm</li> </ul>	11061674	
<p>Path Length Adapter</p> <p>To measure transparent liquids with the X-Cell.</p> <p>The reflector reduces the length of the optical path.</p> <ul style="list-style-type: none"> <li>• Material DIN 1.4404 (SST316L)</li> <li>• Gap 1 / 2 / 5 / 10 / 15 mm available</li> <li>• Diffuse or polished surface</li> </ul>		
<p>Water Cooler Flange</p> <ul style="list-style-type: none"> <li>• Can be used with all instruments, only in combination with X-Cell or Weld-in Flange</li> <li>• Product temperature above 70 °C to 130 °C. A flow rate of 5 l water per hour at 20 °C is required</li> <li>• 40 °C over temp switch for external alarm purpose, NO (Normally Open) circuit</li> <li>• Water connectors for 8/6 mm hose</li> </ul>	11060752	

## 9.2.3 Spare parts specifications

### Power supply



#### NOTICE

#### Risk of property damage due to incorrectly connected mains adapter

An incorrectly connected mains adapter may cause the sensor to fail.

- ▶ Make sure that the current limiter is set to more than 4.5 A.
- ▶ Make sure that the voltage is 12.7 VDC.

#### Specification

Power supply input voltage: 85 - 264 ± 10% VAC

Rated voltage: 12.7 VDC

Rated current: ≥ 4.5A

Typical peak-to-peak residual ripple: 50 mV

Max. peak-to-peak residual ripple: 200 mV

### Device cables



#### NOTE

Loss of performance due to use of unsuitable device cables

Max. cable length between installation box and sensor 10 m.

### Sensor Cable

Pin assignment on device connector viewed from rear of instrument:

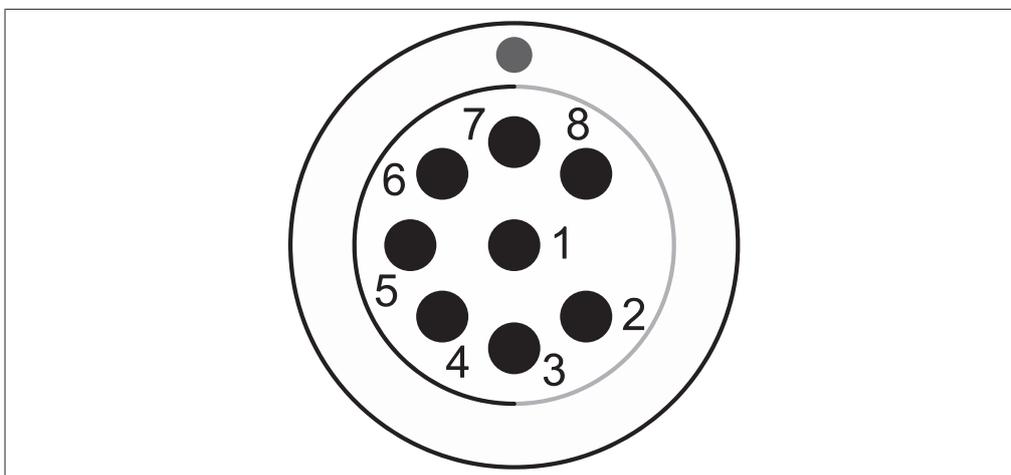


Fig. 8: Pin assignment

1	PIN 1- blue, ground	2	PIN 2- red, 12.7 VDC
3	PIN 3- green, RxD-	4	PIN 4- yellow, TxD+
5	PIN 5- white, TxD-	6	PIN 6- brown, RxD+
7	PIN 7- not connected	8	PIN 8- not connected

## RS422 Data Cable

Pin assignment on the Moxa viewed from rear of the Moxa:

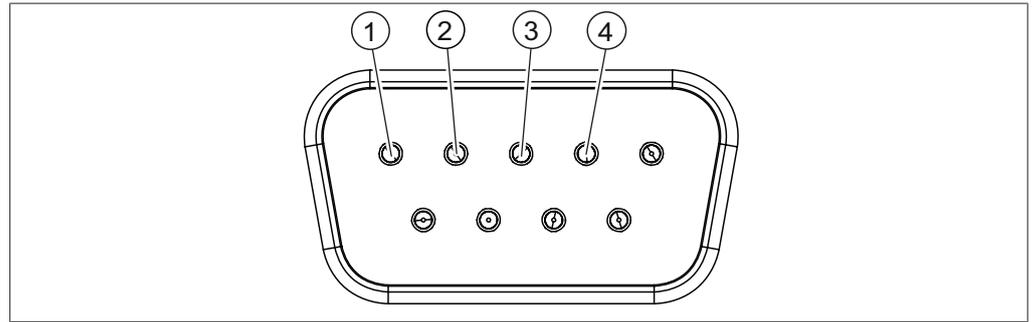


Fig. 9: Pin assignment

1	PIN 1 green, TxD- (A)	2	Pin 2 white (from green), TxD+ (B)
3	Pin 3 orange, RxD+ (B)	4	Pin 4 white (from orange). RxD- (A)

When using the supplied Moxa D-Sub 9-pole connector, swap the cables on pin 1 and 2.

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