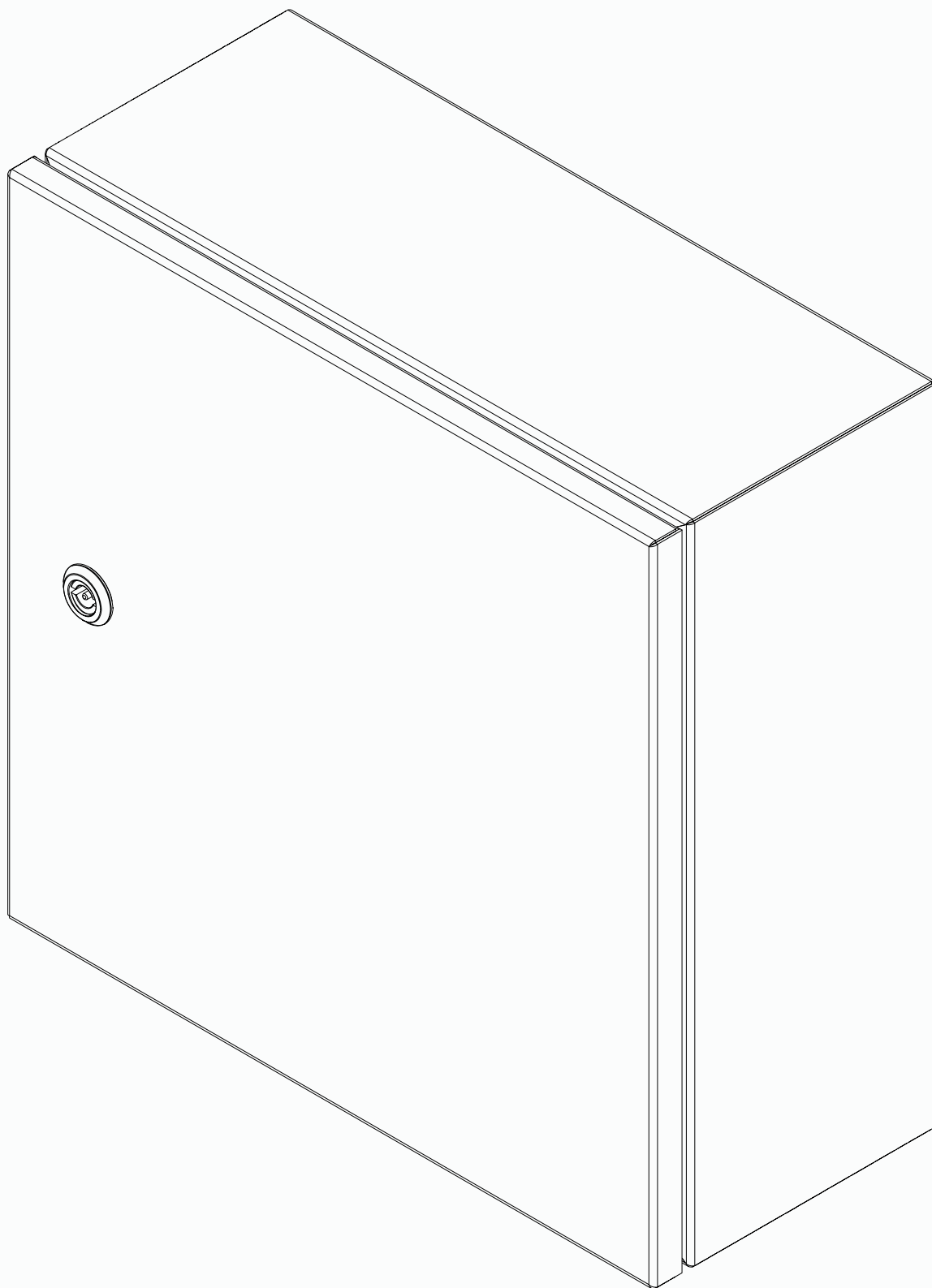




Installation Manual

Installation Box Standard and Standard EB



Imprint

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1 About this document

This installation manual is applicable for all variants of the instrument.

Read this installation manual before operating the instrument and follow the instructions to ensure safe and trouble-free operation.

Keep this installation 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 installation manual:

► Contact BÜCHI Labortechnik AG Customer Service.

<https://www.buchi.com/contact>

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.
Status	Status is marked-up like this.
Signal	Signals are marked-up like this.

2 Safety

2.1 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.

Specially the following uses are not permitted:

- Using the device in areas for which the device is not specified.

2.2 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.

Signal word	Meaning
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.

2.3 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
	Read manual

2.4 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.

2.4.1 Risk of explosion from disconnecting MAINS

Risk of explosion in potentially explosive atmospheres from disconnecting the instrument when the power is switched on.

- Do not disconnect the instrument when the power is switched on.

2.4.2 Risk of explosion from opening up the instrument

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

- ▶ Do not open up the instrument housing.

2.4.3 Risk of instrument failure from overheating

Inadequate heat exchange can cause overheating and lead to instrument failure.

- ▶ Do not cover the instrument during operation.
- ▶ Keep the instrument free of dust buildup greater than 5 mm.

2.4.4 Risk of instrument damage from additional load

The instrument's mountings are designed only for loads expected in the process environment.

- ▶ Do not place any items on the instrument after installation.

2.4.5 Risk of insufficient ingress protection after installation

An inadequate installation of the housing and the cable feed through can affect the ingress protection. The installation must be done according to the manual. If the device is installed in an Ex-protected area or an area where ingress protection is mandatory, a sealing test must be performed by a BUCHI qualified service technician.

2.5 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@buchi.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.

2.6 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.

2.7 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.

2.8 Modifications

Unauthorized modifications may impair safety and lead to accidents.

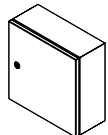
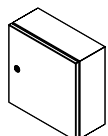
- ▶ Use only genuine Buchi accessories, spare parts and consumables.
- ▶ Technical modifications to the instrument or accessories should only be carried out with the prior written approval of Buchi and only by authorized Buchi service technicians.

Buchi accepts no liability whatsoever for damage arising as a result of unauthorized modifications.

3 Product Description

This document describes different types of the BÜCHI NIR-Online Installation Box and how to install them.

The types consist of:

	Order no.	Image
Installation Box Standard	11060744	
Installation Box Standard EB	11063054	

3.1 Technical Data

Specifications

Dimensions (W x D x H)	317 x 300 x 167 mm
Weight (excl. cables)	5.4 kg
Weight (incl. cables, 2 x 10 m)	7.0 kg
Voltage	100–240 VAC ±10%
Frequency	50/60 Hz
Power consumption	60 W
Overvoltage category	II
Degree of protection	IP66
Pollution degree	2
Minimum clearance on all sides	100 mm
Appliance class	I
ATEX	II 3D Ex tc IIIC T60°C Dc
EMC environment	Industrial Environment
EMC emission class	Class B
EMC standard	IEC 61326-2-3

3.1.1 Ambient Conditions

For indoor and outdoor use

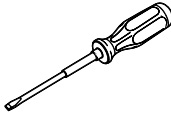
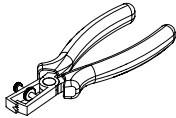
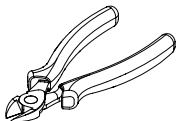
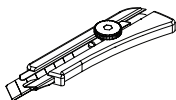
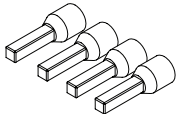
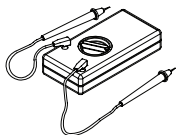
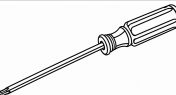
Specifications

Ambient temperature	-10 °C to +40 °C
Max. relative air humidity	80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40 °C
Max. altitude above sea level	2,000 m
Storage temperature	max 45 °C

3.1.2 Materials

Housing Material	Stainless Steel
Material quality	1.4301/304
Seal material	VMQ-(silicone)

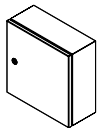
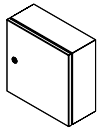
4 Tools

	Order no.	Image
Slotted screwdriver for electrical applications (Size 0)	none	
Wire stripper	none	
Small side cutter	none	
Cutter	none	
Electric wire ferrule	none	
Multimeter	none	
Hex Key Size 4 Ideally with a torque adjusted to 2 Nm	none	
Hex Key Size 5 Ideally with a torque adjusted to 3 Nm	none	
Torx T25 Screwdriver Ideally with a torque adjusted to 2 Nm	none	

5 Consumables

Standard scope of delivery:

One of the following installation boxes

	Order no.	Image
Installation Box Standard	11060744	
Installation Box Standard EB	11063054	

One of the following sensor cables

Device Connection Cable

	Order no.
Binder Sensor Cable 10m	11061667



NOTE

Binder Sensor cables are needed additionally for sensors ordered before 2018.

Fischer Sensor Cable 10m	11067427
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NOTE

Fischer Sensor Cables are included in all deliveries.

Data cable (Should be ordered separately)

Standard RS-422 data cables:

	Order no.
RS-422 data cable, 10 m	11063036
RS-422 data cable, 20 m	11063037
RS-422 data cable, 30 m	11063039
RS-422 data cable, 50 m	11063040
RS-422 data cable, 70 m	11063041
RS-422 data cable, 100 m	11063042
RS-422 data cable, 150 m	11063043
RS-422 data cable, 200 m	11063044
RS-422 data cable, 300 m	11072833
RS-422 data cable, 400 m	11072834
RS-422 data cable, 500 m	11072835

PUR-insulated RS-422 data cables:

	Order no.
PUR RS-422 data cable, 10 m	11063045
PUR RS-422 data cable, 20 m	11063046
PUR RS-422 data cable, 30 m	11063047
PUR RS-422 data cable, 50 m	11063048
PUR RS-422 data cable, 70 m	11063049
PUR RS-422 data cable, 100 m	11063050
PUR RS-422 data cable, 150 m	11063051

**NOTE**

The additional resistance rating may be required for GasEx installations.

Power supply

	Order no.
Power Supply 12.7 V, 54 W DIN Rail	11063076

6 Power Supply



⚠ WARNING

Risk of electric shock with connected power supply cable.

Serious injuries or death can result.

- ▶ Switch off the device.
- ▶ Disconnect the power supply cable from the device.

All NIR-Online power supply units are delivered pre-configured and tested.

6.1 Mains supply cable



⚠ WARNING

Risk of electric shock from using unsuitable cable.

Using an unsuitable cable may result in overheating, fire, or electric shock.

- ▶ Only use cables meeting the specified requirements.

The mains supply cable must be supplied by the customer. Ensure that it meets the following requirements.

Cable requirements

- Conductor cross-section: min. 0.75 mm² or AWG 18 Cu, min 300V isolation
- Number of cores: 3 cores (L, N, PE)
- Sheath material: suitable for the installation environment (e.g., H07RN-F), round, and min 600V with Conductor isolation
- Temperature resistance: +70 °C or higher
- The mains supply cable must be permanently installed and comply with the national installation standard (e.g., IEC 60364, local regulations).
- Round cable fitting one of the provided cable grommets. Diameter 7 - 10 mm

Connection requirements



⚠ WARNING

Electrical Connection

- ▶ Carry out the installation according to the instructions. See Electrical Installation Guide.

- The electrical connection may only be carried out by a qualified electrician.
- A suitable protective device (e.g. 10 A circuit breaker, slow-blow) must be provided.
- If the instrument is permanently installed, a disconnection device with at least 3 mm contact separation in all poles must be provided.
- No bare conductors may be touchable.
- Attach the mains cable to the strain relief.
- Ensure that the used cable grommet fits properly.

6.2 Power Supply 12.7 V

6.2.1 Adjustment of the Power Supply

All wires must be provided with ferrules before connecting.

The power supply can work with any input voltage (100 – 240 V, 50/60 Hz) and adjusts itself to it.

The required output voltage is **12.7 VDC**.

To measure the output voltage, connect the multimeter to the plus (+) and minus (-) terminals. (figure below)

Make sure the multimeter measures in DC.

If the output voltage deviates, adjust it again by turning the voltage modulator clockwise to increase the voltage and counterclockwise to reduce the voltage. (second figure below)



NOTICE

Risk of material damage due to incorrect adaptation to the requirements.

An incorrectly adjusted output voltage can lead to permanent device damage.



Fig. 1: Terminals to measure the output voltage



Fig. 2: Voltage Adjustment Screw

6.2.2 Power supply

To supply a process analyzer with voltage, the red and blue cables of the sensor line must be connected to the power supply unit.

The correct wiring is shown in Chapter 7 "Installation Box Standard", page 15 or Chapter 8 "Installation Box Standard EB", page 17.

6.2.3 Mode of Operation

The power supply unit is connected to a mains voltage of **100 – 240 V and 50/60 Hz**. In order to supply a process analyzer with voltage via the sensor cable, the voltage is converted to **12,7 VDC**.

The wires of the sensor cable and those of the data cable are linked to one another via terminal blocks. The data generated by the process analyzer are transmitted to the connected computer via this connection.

7 Installation Box Standard

7.1 Description

The Installation Box Standard supplies NIR-Online sensors type X-One, PA2 and X-Sential SE with power.

- Earthing conductor must be at least 30mm longer than mains conductors
- Remove maximum 60mm of sheath on the mains cable.
- Data cable and sensor cable maximum. 70mm of sheath into the housing.
- No bare conductors may be touchable
- Attach the mains cable to the strain relief.
- Ensure that the used cable grommet fits properly.
- Torque for all 6 screws of cable entry: 2 Nm.
- Torque for strain relief: 3 Nm.

7.2 Wiring

The sensor cable and the data cable are connected to one another via terminal blocks.

The wiring is shown below.

Terminal No.	Upper Connection	Lower Connection
1	Ground input fuse/filter (yellow/green)	-
2	Power supply - (black)	Instrument cable (blue)
3	Power supply + (red)	Instrument cable (red)
4	Power supply - (yellow/green)	Housing (yellow/green)
5	Data RS422 (green)	Instrument cable (green)
6	Data RS422 (white or yellow)	Instrument cable (yellow)
7	Data RS422 (orange or brown)	Instrument cable (brown)
8	Data RS422 (white)	Instrument cable (white)

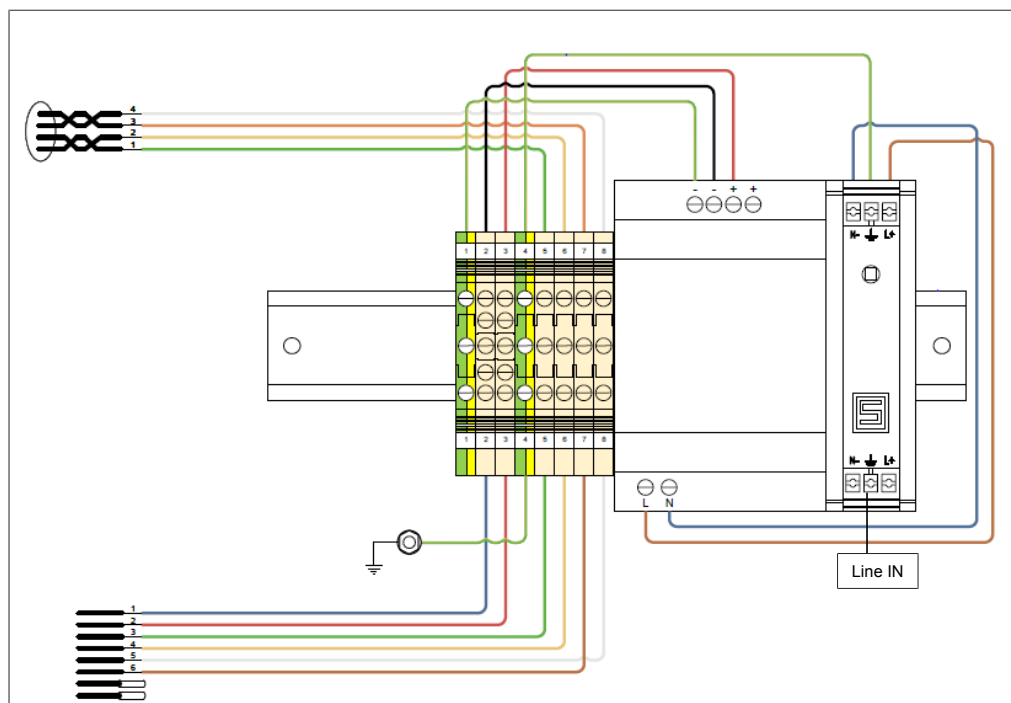


Fig. 3: Circuit Diagram for Installation Box Standard



NOTE

The colors of the data cable wires are different between the standard and the PUR cables.

Standard		PUR	
1	Green	1	Green
2	White	2	Yellow
3	Orange	3	Brown
4	White	4	White

8 Installation Box Standard EB

8.1 Description

This modification transfers the function of the journal button on the back of a sensor to an external button. An installation box with external push button is used when the button of the process analyzer is out of reach.

8.2 Wiring

The wiring of this installation box is shown below.

The button used as an external button must be a potential-free push button.

Voltage min. 15 VDC, Current min. 15 mADC

The power supply must be checked before commissioning (See Chapter 6 “Power Supply”, page 12).

Terminal No.	Upper Connection	Lower Connection
1	Ground input fuse/filter (yellow/green)	-
2	Power supply - (black)	Instrument cable/Terminal 11 In (blue)
3	Power supply + (red)	Instrument cable/Relay port A1 (red)
4	Power supply - (yellow/green)	Housing (yellow/green)
5	Data RS422 (green)	Instrument cable (green)
6	Data RS422 (white or yellow)	Instrument cable (yellow)
7	Data RS422 (orange or brown)	Instrument cable (brown)
8	Data RS422 (white)	Instrument cable (white)
9	Relay port 11 (grey)	Instrument cable (grey)
10	Relay port 14 (pink)	Instrument cable (pink)
11	Terminal 2 out (blue)	External push button 1
12	Relay port A2 (blue)	External push button 2

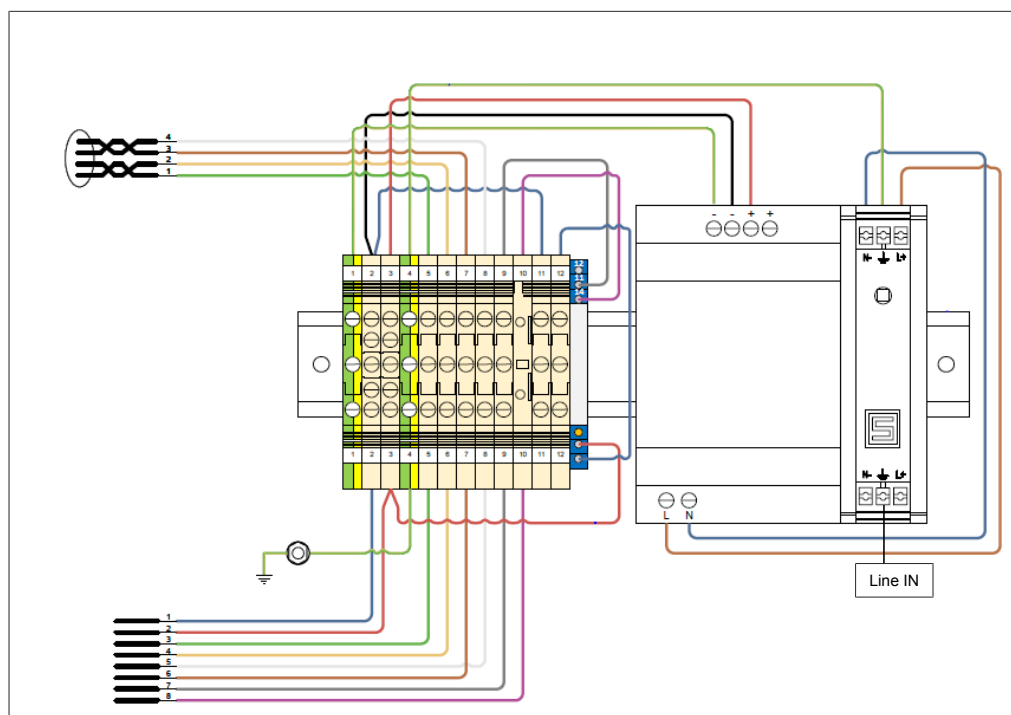


Fig. 4: Circuit Diagram For Installation Box Standard EB

**NOTE**

The colors of the data cable wires are different between the standard and the PUR cables.

Standard**PUR**

1	Green	1	Green
2	White	2	Yellow
3	Orange	3	Brown
4	White	4	White

Cable Preparation and Installation Requirements

- Earthing conductor must be at least 30mm longer than mains conductors.
- Remove max 60mm of sheath on the mains cable.
- Data cable and sensor cable max. 70mm of sheath into the housing.
- No bare conductors may be touchable.
- Attach the mains cable to the strain relief.
- Ensure that the used cable grommet fits properly.
- Torque for all 6 screws of cable entry: 2 mm.
- Torque for strain relief: 3 mm

Cable Requirements for External Button

- Conductor cross-section: min. 0.5 mm² or AWG 22 Cu
- Number of cores: 2 cores
- Sheath material: suitable for the installation environment (e.g., H07RN-F)
- Temperature resistance: +70 °C or higher.
- Round cable which fits into one of the provided cable grommets. Diameter 3-9mm
Ensure that the used cable grommet fits properly.
- No bare conductors may be touchable.
- The wire of the external button must be installed short enough that it is not possible it gets in contact with unsheathed line in wires.

9 Wall Mounting

Refer to the attached housing manufacturer's instruction manual for assembly instructions, screw sizes, and tightening torques. Use all four mounting holes and seal them properly to ensure secure fixation and the required ingress protection.

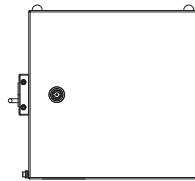


NOTICE

Risk of losing the IP66 rating

Failure to use the enclosure mounting kit during assembly can impair the IP66 classification and consequently the explosion protection.

9.1 Alignment



9.2 Drilling Plan and Dimensions

The drilling plan and dimensions for variant installation boxes are shown below.

The distance values of the drill holes can be taken from figures below.

The Installation Box Standard (Order No.11060744) and the Installation Box Standard EB (Order No.11063054) have the dimensions 300 x 300 x 167 mm.

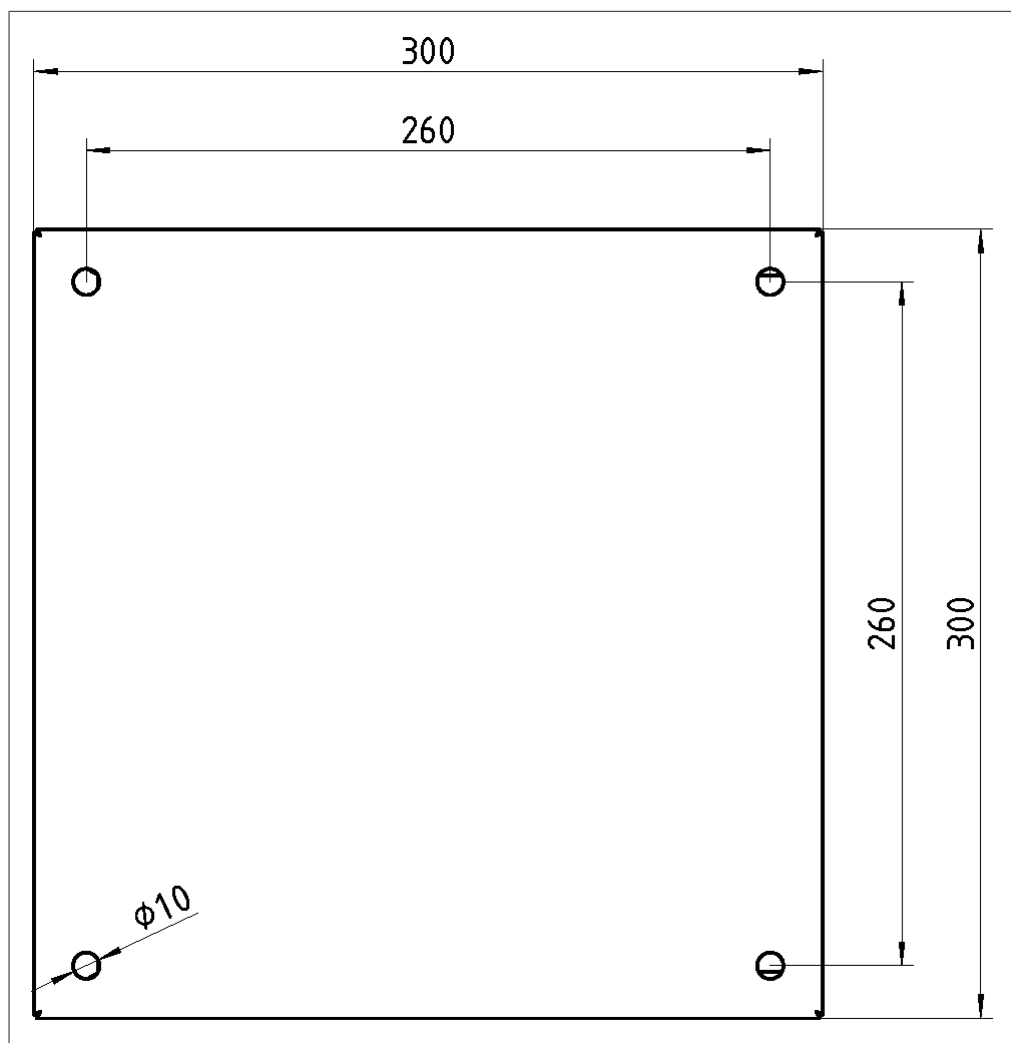


Fig. 5: Drilling plan Installation Box Standard and Installation Box Standard EB

9.3 Ground Connection

Tools Required:

- Hex Key Screwdriver Size 4

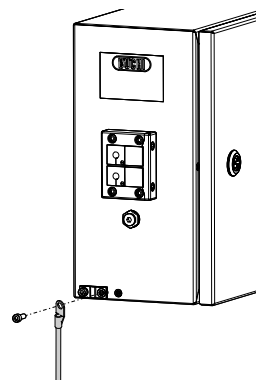


NOTE

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

Tightening torque: $3.5 \text{ Nm} \pm 0.5$

- Attach the ground cable to the sensor.





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