Instruction Manual For

Adapter Box

(Original Instruction Manual – German)

valid as of serial number 1148NIZ0076

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Translation

If the device is sold to a country in the European currency area, this instruction handbook must be translated into the language of the country in which the device is to be used.
Should the translated text be unclear, the original instruction handbook (German) must be consulted or the manufacturer contacted for clarification.

Names

The use of general descriptive names, trade names, trademarks and the like in this handbook does not entitle the reader to assume they may be used freely by everyone. They are often protected registered trademarks even if not marked as such.

1 Contents

1.1 Table of Contents

2 Overview and use in accordance with the requirements

2.1 Overview

1 Enclosure fittinge

2 Enclosure

3 Cable glands

Fig. 2-1 Overview adapter box

2.2 Use in accordance with the requirements

The adapter box is conceived for the extension of signal lines between flow velocity sensors and transmitter, type NivuChannel and NicuSonic. It contains active components for signal conversion and amplification and therefore has to be operated with an active supply voltage.

In order to connect power supply, sensors and bus cables it is necessary to open the cover of the adapter box and to take out the entire electronics and terminal clamps. This will leave the electronic components open and unprotected. Installation is therefore allowed to be carried out by NIVUS or NIVUS authorised companies only.

Protect electronic components from moisture (rain or similar) and dirt.

Do not touch pcb tracks and components directly with fingers.

2.3 Specifications

Power supply	100 – 240 V AC, +10% /-15%, 47 to 63Hz or 24 V DC ±15 %, 5 % residual fluctuation or 11,4 - 15 V DC
Power consumption	Max. 48 VA
Enclosure	Material: aluminium die casting Protection: IP 65
Operating temperature	-20°C to +50°C
Storage temperature	-30°C to +70°C
Max. humidity	80%, non-condensing
Inputs 12 V DC	Max. 8 x Sensor connections / 4 Paths (2 DSP cards)
Inputs 24 V DC / 230 V AC	Max. 16 x Sensor connections / 8 Paths (4 DSP cards)
Cable length	Max. 200 m (transmitterr → adapter box) Max. 100 m (adapter box → sensors)
Accessories	Bus cable for connecting adapter box and transmitter, Type: LiYC11Y 2 x 1,5 mm² +1 x 2 x 0,34 mm², Outside cable diameter: 8,4 mm ±0,25 mm

3 General Notes on Safety and Danger

3.1 Danger Notes

3.1.1 General Danger Signs

Cautions
are framed and labelled with a warning triangle.

Notes
are framed and labelled with a "hand".

Danger by electric voltage
is framed and labelled with the Symbol on the left.

Warnings
are framed and labelled with a "STOP"-sign.

For connection, initial start-up and operation of the adapter box the following information and higher legal regulations (e.g. in Germany VDE), such as Ex-regulations as well as safety requirements and regulations in order to avoid accidents, must be observed.
Due to reasons of safety and guarantee all operations, which go beyond steps to install, to connect or to program the device, shall be carried out by NIVUS staff or NIVUS authorised personnel or companies only.

3.2 Device Identification

The instructions in this manual are valid only for the type of device indicated on the title page.
The nameplate is fixed on the bottom of the device and contains the following:

- Name and address of manufacturer
- CE label
- Type and serial number
- Year of manufacture
- Ex-label (on Ex-version devices only) as mentioned in chapter 2.2.

It is important for enquiries and replacement part orders to specify article number as well as serial number of the respective transmitter or sensor. This ensures correct and quick processing.

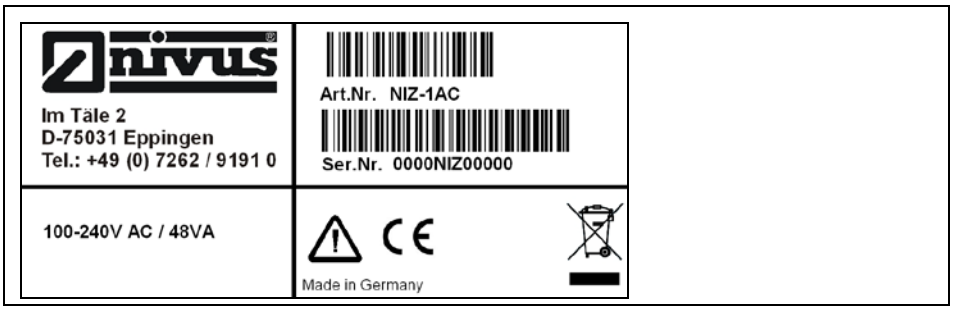


Fig. 3-1 Nameplate of adapter box

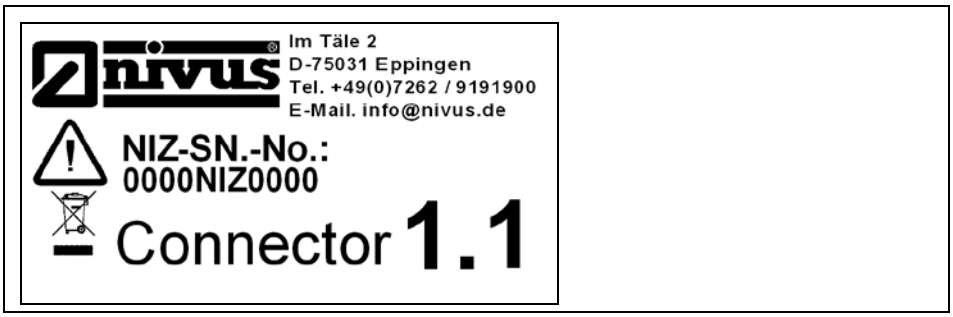


Fig. 3-2 Sensor connection to NIZ and allocation

This instruction manual is a part of the device and must be available for the user at any time.

The safety instructions contained therein must be followed.

It is strictly prohibited to disable the safety installations or to change the way they work.

3.3 Installation of Spare Parts and Parts subject to wear and tear

We herewith particularly emphasize that replacement parts or accessories, which are not supplied by us, are not certified by us, too. Hence, the installation and/or the use of such products may possibly be detrimental to the device's ability to work or even lead to instrument failure.
Damages or measurement errors caused by the use of non-original parts and non-original accessories are left at user's risk.

3.4 Turn-off procedure

For maintenance, cleaning and repairs (authorised staff personnel only!) the device shall be disconnected from mains.

3.5 User's Responsibilities

In the EEA (European Economic Area) national implementation of the framework directive 89/391/EEC and corresponding individual directives, in particular the directive 89/655/EEC concerning the minimum safety and health requirements for the use of work equipment by workers at work, as amended, are to be observed and adhered to.
In Germany the Industrial Safety Ordinance must be observed.

The customer shall obtain any local **operating permits** required and observe the provisions contained therein.
In addition to this, he must observe local laws and regulations on

- personnel safety (accident prevention regulations)
- safety of work materials and tools (safety equipment and maintenance)
- disposal of products (laws on wastes)
- disposal of materials (laws on wastes)
- cleaning (cleansing agents and disposal)
- environmental protection

Connections:

Before operating the device the user has to ensure, that the local regulations (e.g. for operation in channels) on installation and initial start-up are taken into account, if this is both carried out by the user.

3.6 Device Versions

The adapter box is available in different versions. The type key below gives a brief overview on the various possibilities.
The adapter box varies in the number of sensor connections and power supply. The current type of device is indicated by the article number, which can be found on a weatherproof label on the side of the enclosure.
From the type key below the type of device can be specified precisely.

NIZ-	Type	
	1	1-2 Measurement paths (NivuChannel, NivuSonic)
	4	4 Measurement paths (NivuChannel)
	6	6 Measurement paths (NivuChannel)
	8	8 Measurement paths (NivuChannel)
	Power Supply	
	AC	100-240 V AC / 47-63Hz
	DC	24V stabilised
NIZ-		

Fig. 3-3 Type key for adapter box

Adapter box types:

- NIZ type 1 (1-2 measurement paths, one DSP board)
- NIZ type 4 (3-4 measurement paths, two DSP boards)
- NIZ type 6 (5-6 measurement paths, three DSP boards)
- NIZ type 8 (7-8 measurement paths, four DSP boards)

All types provide identical clamp names. Depending on the type, a different number of DSP boards may be built-in. Four sensors (2 paths) can be connected to each of the DSP boards.

4 Storing, Delivery and Transport

4.1 Receipt

Please check your delivery according to the delivery note for completeness and intactness immediately after receipt. Any damage in transit must be instantly reported to the carrier. An immediate, written report must be sent to NIVUS GmbH Eppingen as well.
Please report any delivery incompleteness in writing to your representative or directly to NIVUS Eppingen within two weeks.

Mistakes cannot be rectified later!

4.2 Delivery

The standard delivery of the adapter box contains:

- the instruction manual with the certificate of conformity. Here, all necessary steps to correctly install and to operate the adapter box are listed.
- one adapter box

Additional accessories such as sensors, connection cables, overvoltage protection etc. depending on order. Please check by using the delivery note.

4.3 Storing

The following storing conditions shall be strictly adhered to:

max. temperature:	+ 70°C
min. temperature:	- 30°C
max. humidity:	80 %, non-condensing

The adapter box must be protected from corrosive or organic solvent vapours, radioactive radiation as well as strong electromagnetic radiation.

4.4 Transport

The adapter box is designed for harsh industrial conditions. Despite this do not expose them to heavy shocks or vibrations.
Transportation of the transmitter must be carried out in the original packaging.

4.5 Return

The units must be returned at customer cost to NIVUS Eppingen in the original packaging free of charge.
Shipments franked for insufficient amounts will not be accepted!

5 Installation

5.1 General

For electric installation the local regulations in the respective countries (e.g. VDE 0100 in Germany) must be referred to.

The adapter box power supply must be separately protected by a 6 A slow-blow fuse and has to be isolated from other facility parts (separate turn-off, e.g. by using an automatic cut-out with >B< characteristics).

Before feeding the rated voltage the transmitter and sensor installation must be correctly completed. The installation should be carried out by qualified personnel only. Further statutory standards, regulations and technical rulings have to be taken into account.
All outer circuits, wires and lines connected to the device must have a minimum isolation resistance of 250 V. If the voltage exceeds 42 V DC an isolation resistance with 500 kOhm min. will be required.
The cross-sectional dimension of the power supply wires must be 0.75 mm^2 (0.03 in^2) and must be in accordance to IEC 227 or IEC 245.

5.2 Assembly

5.2.1 Mounting place selection

The mounting place of the adapter box has to be selected according to certain criteria.
Please strictly avoid:

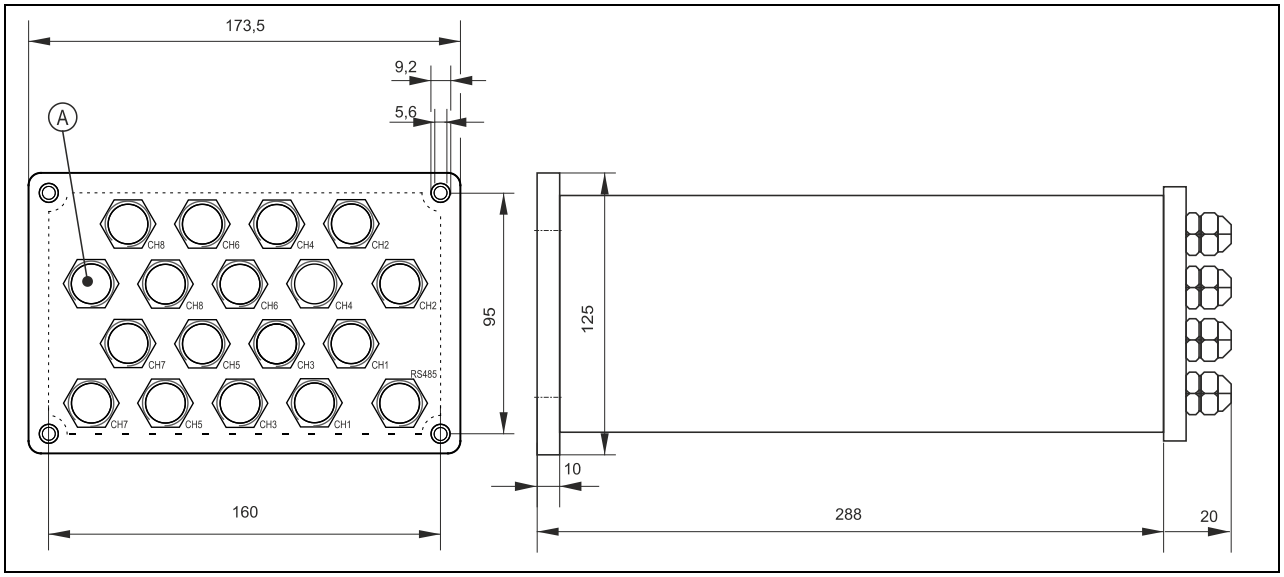
- direct sunlight (use weatherproof cover if necessary, e.g. NIVUS Art. No. ZMS01800)
- objects radiating strong heat
- objects with strong electromagnetic fields (e.g. frequency converters, electric motors with high power consumption or similar)
- corrosive chemicals or gas
- mechanical shocks
- installation close to footpaths or travel ways
- vibrations
- radioactive radiation

5.2.2 Fastening

Install the adapter box in a way that the cable glands look towards the ground by using separate installation angles. These angles have to be manufactured following the conditions of the mounting place (Fig. 5-27).

We recommend the mounting after complete cable connecting.

5.2.3 Enclosure Dimensions



A = Power supply

Fig. 5-1 Enclosure Dimensions Adapter box

5.3 Cable Glands

The adapter box is equipped with metal cable glands and dummy plugs. Depending on the number of paths ordered different types of screw joints may be mounted:
1 measurement path: 4 x M 20 x 1,5 type 1710 (screwed in)
2 measurement paths: 6 x M 20 x 1,5 type 1710 (screwed in)
3 measurement paths: 8 x M 20 x 1,5 type 1710 (screwed in)
4 measurement paths: 10 x M 20 x 1,5 type 1710 (screwed in)
5 measurement paths: 12 x M 20 x 1,5 type 1710 (screwed in)
6 measurement paths: 14 x M 20 x 1,5 type 1710 (screwed in)
7 measurement paths: 16 x M 20 x 1,5 type 1710 (screwed in)
8 measurement paths: 18 x M 20 x 1,5 type 1710 (screwed in)

With the supplied glands the following outer cable cross-sections can be connected reliably: Type 1710: 8-10 mm
The pre-mounted cable glands are designed to reliably lock and shield the cables of sensors type NOS or NIS, the power supply as well as the connection cable to the measurement transmitter.

Unused lead-ins have to be locked tightly with an appropriate dummy plug before the initial start-up.
To be able to use cable diameters outside of the tolerance, metal glands must be used which ensure IP 65 minimum protection as well as proper shielding of sensor cables.

An installation is allowed to be carried out by NIVUS or NIVUS authorised companies only.

The event that of a breach of this obligation will invalidate the NIVUS warranty for this component.

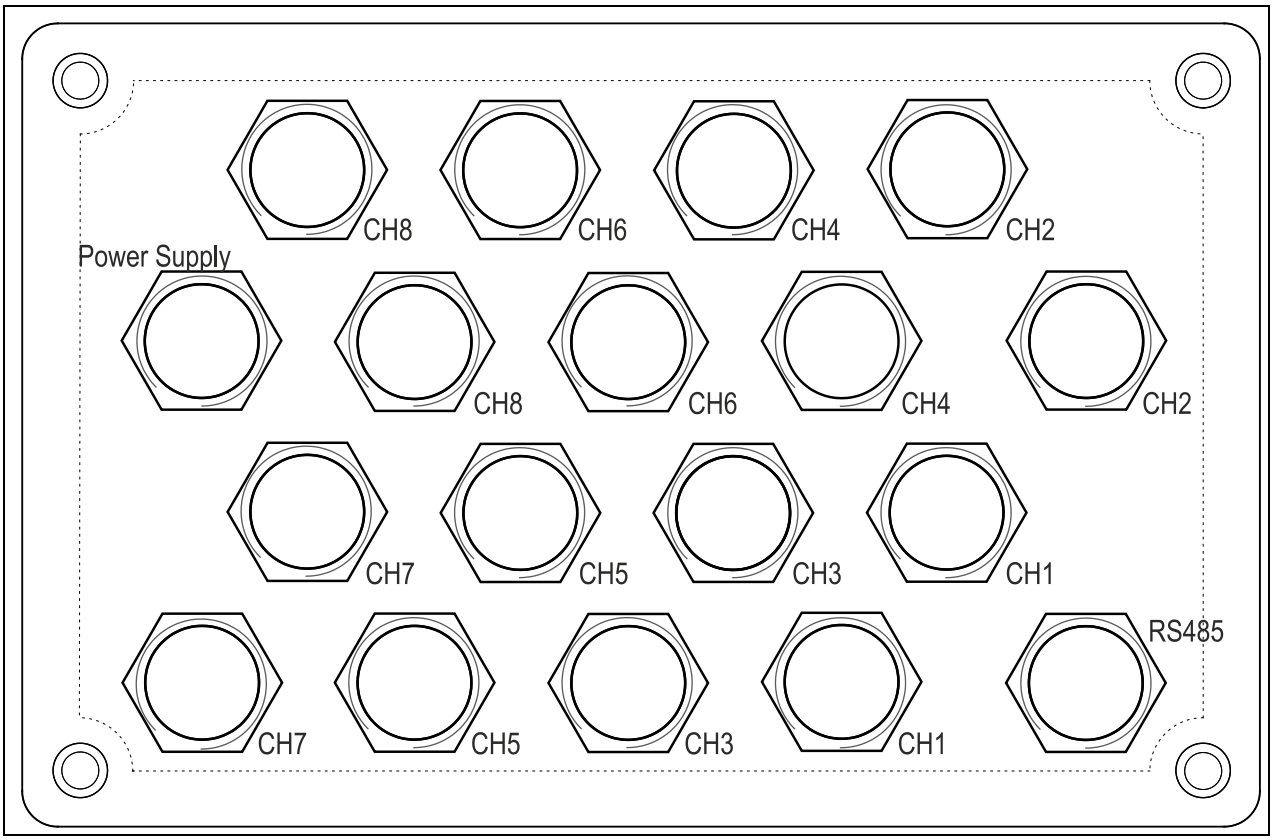


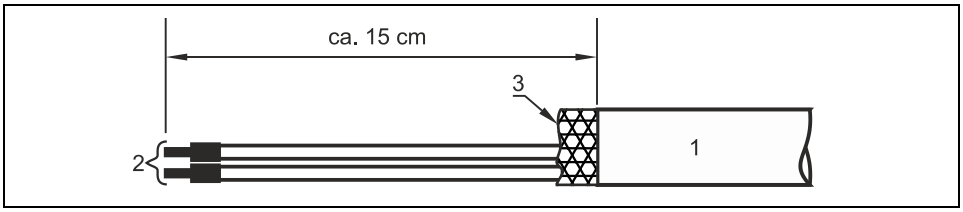
Fig. 5-2 Overview cable glands / measurement paths

5.4 Sensor cable

The sensor is equipped with a special cable which enables error-free and reliable signal transmission
The maximum cable length is allowed:
Measurement transmitter → Sensors: 100 m
Measurement transmitter → Adapter box: 200 m
Adapter box → Sensors: 100 m

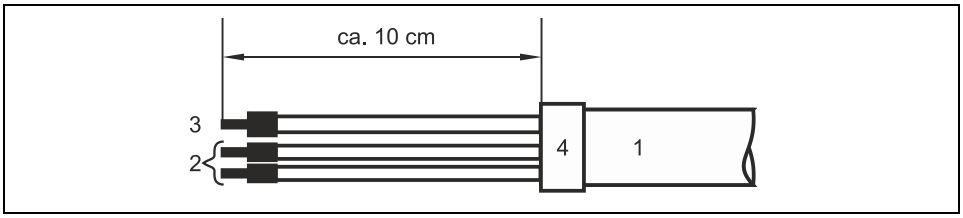
Never extend the fixed cable on the sensor.
For extension please use the active adapter box Type NIZ available from NIVUS.

The sensors vary in terms of cable end configuration depending on connection ordered.
Sensors, type NOS- with connection >D< as well as NIS- with connection >K< have 2 transparent signal wires (coppery and silver-coloured core) as well as a black direct shield wire which is connected to the cable shield via a special connection on the cable sheath (see Fig. 5-4). They are designed for direct connection to the terminal clamp strip of the transmitter.
Sensors, type NOS- or NIS- with connection >Z< have only the 2 transparent signal wires (coppery and silver-coloured core, see Fig. 5-3).
Uncover the cable shield by removing the transparent isolation tape carefully. It serves a direct shield via the metal cable glands of the adapter box



1 Cable sheath
2 Signal cable
3 Shield cable

Fig. 5-3 Pre-configured sensor cable to adapter box



1 Cable sheath
2 Signal cable
3 Shield cable
4 Crimped connection, cable shield of shield wire

Fig. 5-4 Pre-configured sensor cable to measurement transmitter

It requires connection Type >Z< (sensors and transmitter) in order to extend sensors using the adapter box.
Connection Type >D< or >K< (sensors and transmitter) is required to directly connect sensors to transmitter.

5.5 Wiring Diagrams

All wiring diagrams in this manual apply to the adapter box from serial number 1148NIZ0076 onwards.

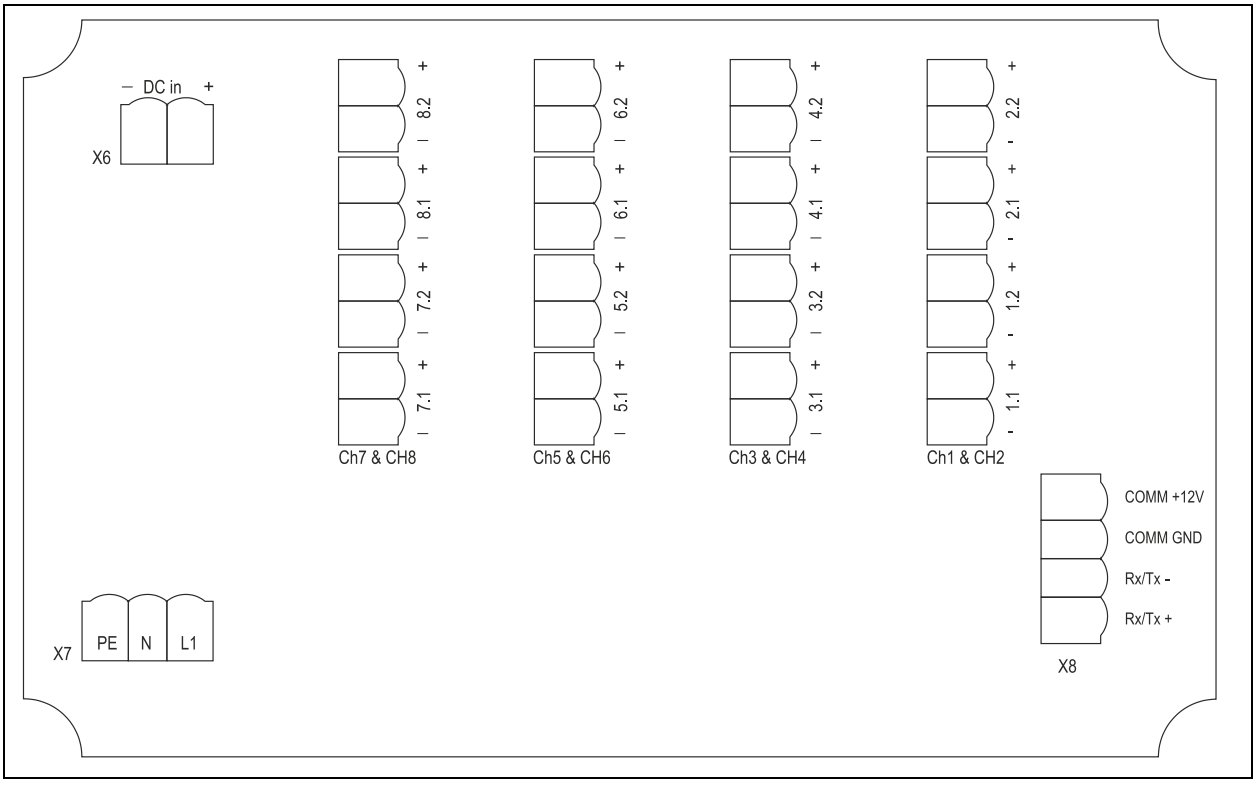


Fig. 5-5 Adapter box wiring from serial number 1148NIZ0076 onwards

The sensor cable has to be connected to the adapter box at the connector field.

On the sensors as well as on the cable ends you can find a label designating which clamp of the adapter box the sensor must be connected to (see Fig. 3-2). The same label also allows to assign the sensors to the according adapter box.

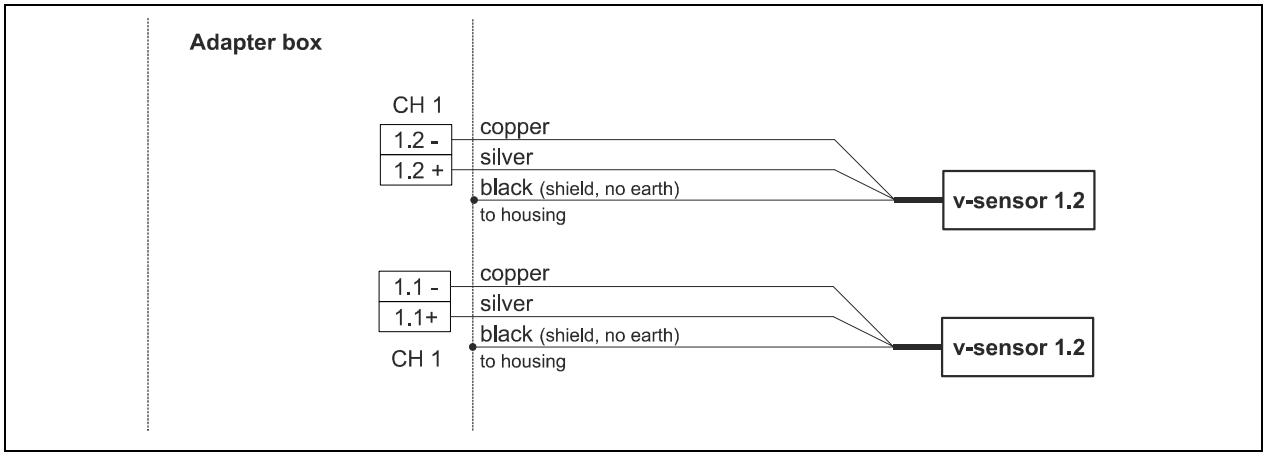


Fig. 5-6 Connecting flow velocity sensors (Path 1)

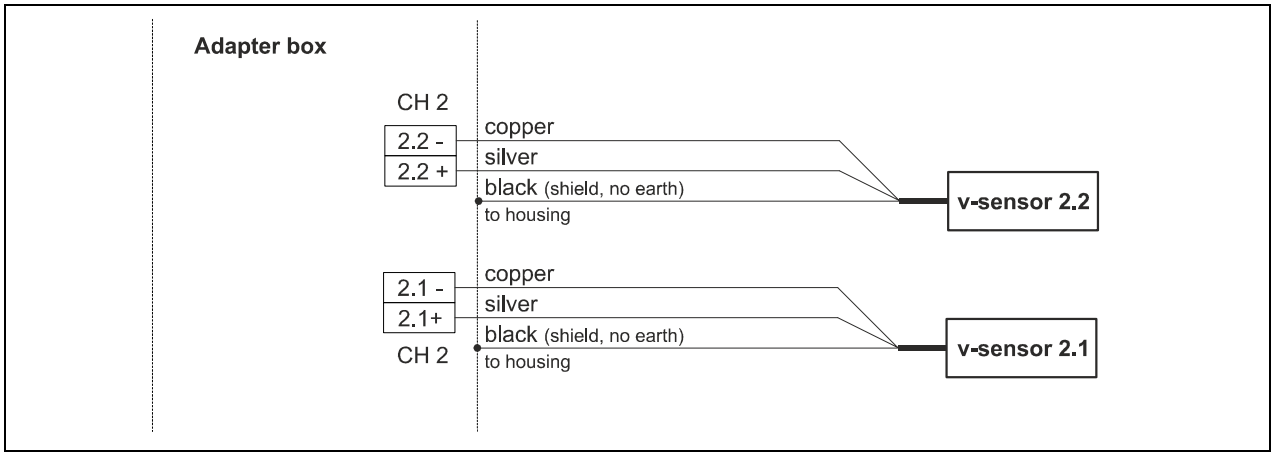


Fig. 5-7 Connecting flow velocity sensors (Path 2)

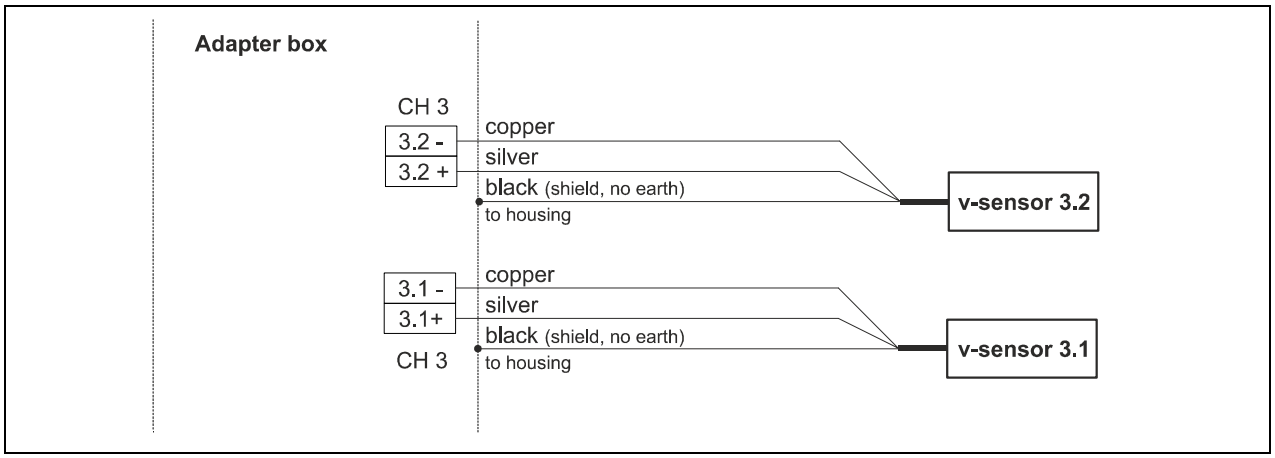


Fig. 5-8 Connecting flow velocity sensors (Path 3)

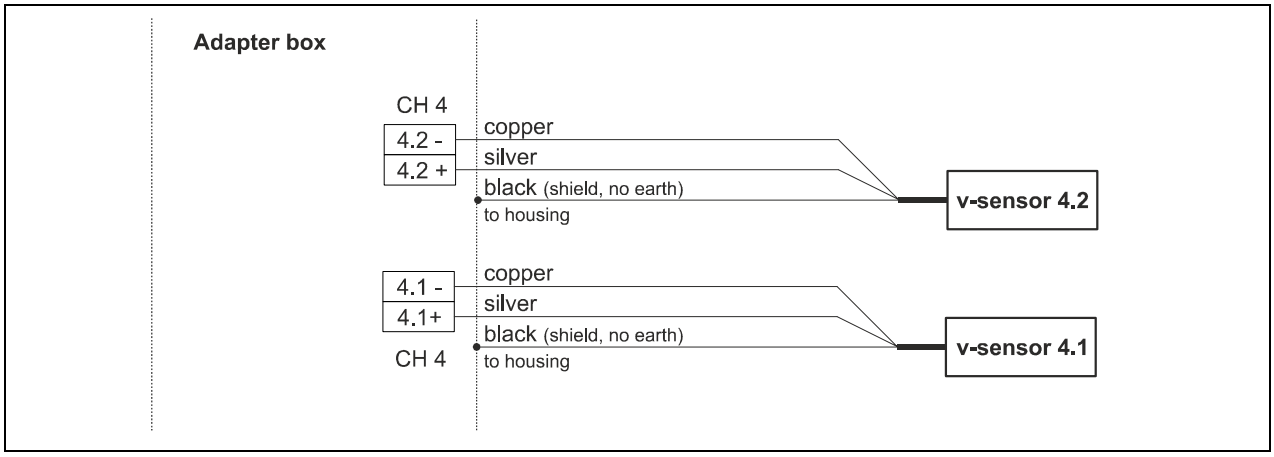


Fig. 5-9 Connecting flow velocity sensors (Path 4)

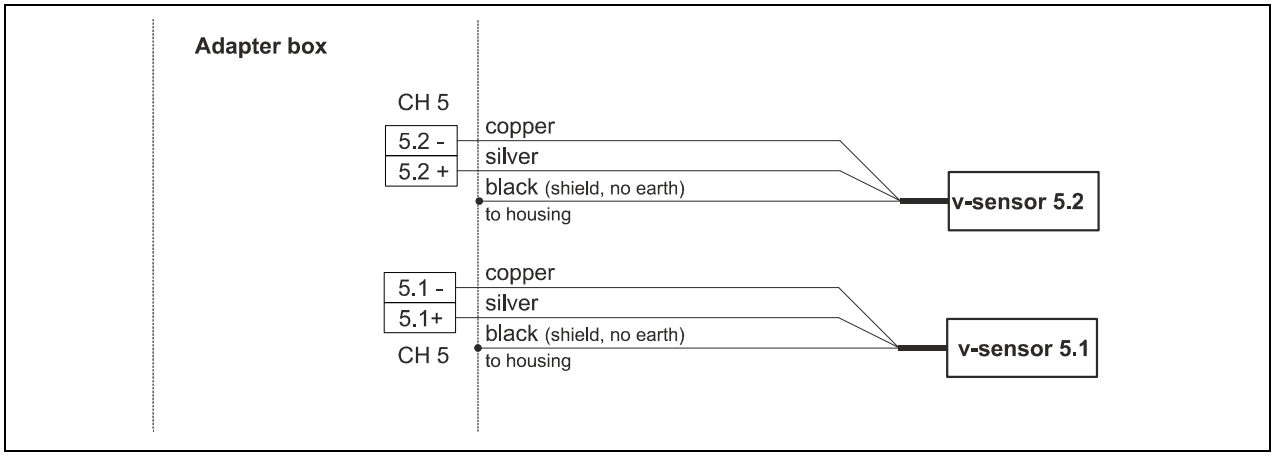


Fig. 5-10 Connecting flow velocity sensors (Path 5)

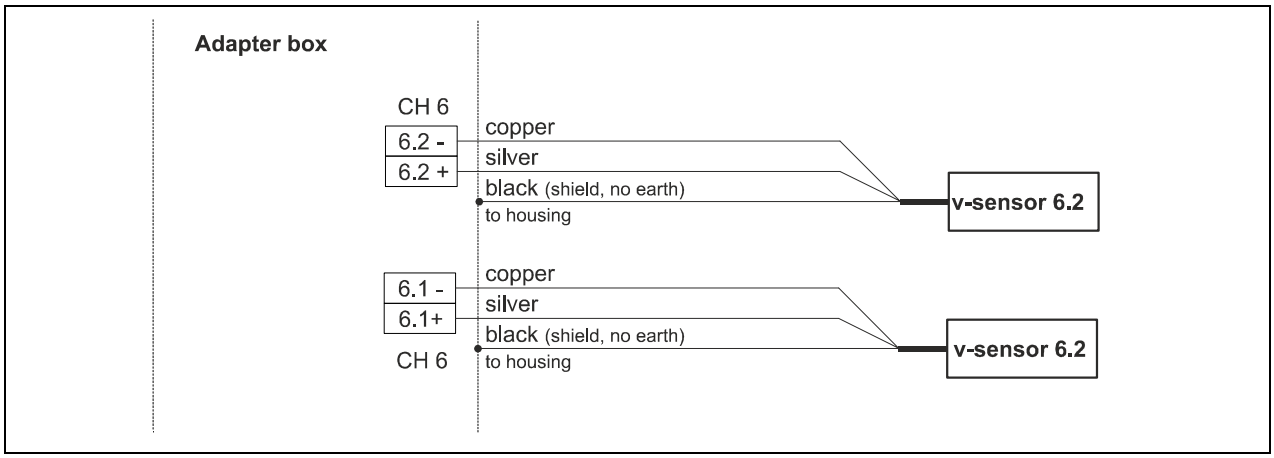


Fig. 5-11 Connecting flow velocity sensors (Path 6)

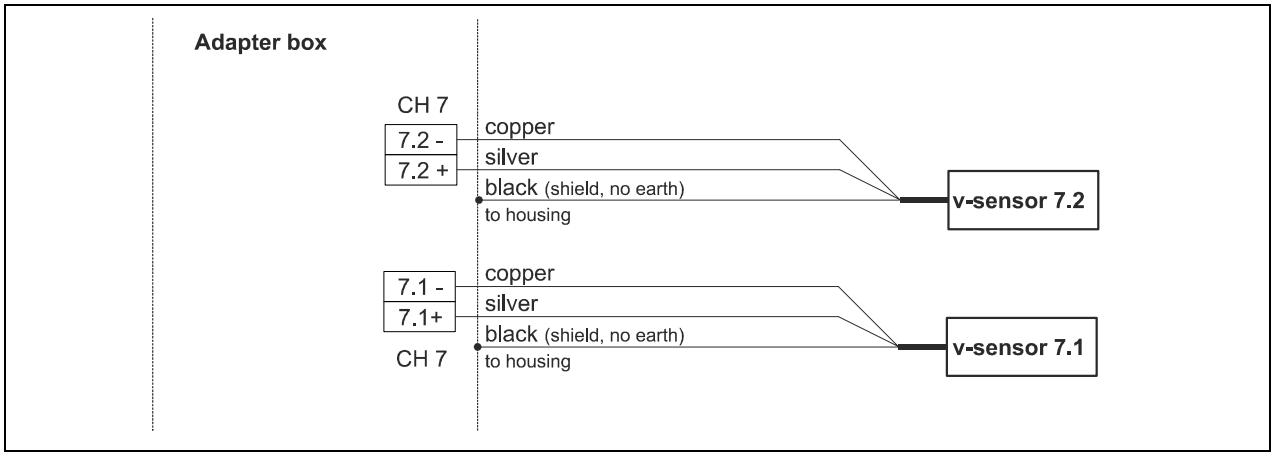


Fig. 5-12 Connecting flow velocity sensors (Path 7)

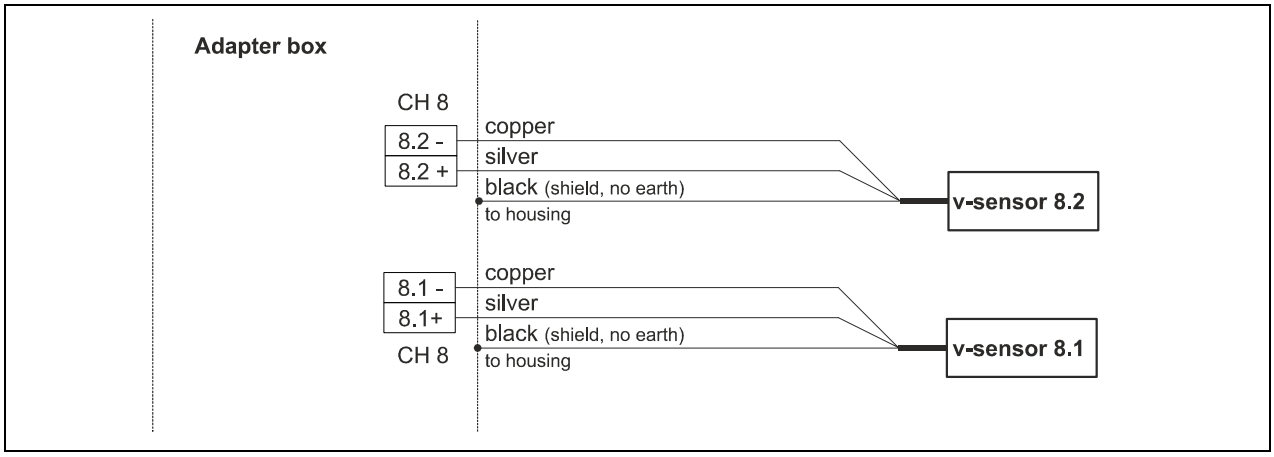


Fig. 5-13 Connecting flow velocity sensors (Path 8)

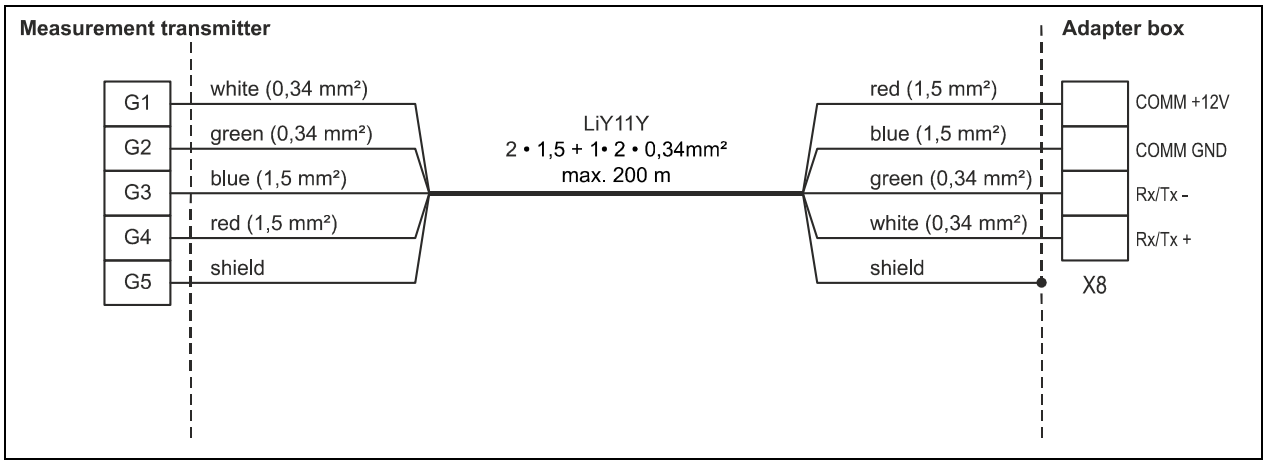


Fig. 5-14 Connection adapter box to measurement transmitter

The adapter box is equipped with plug connections to connect power supply and sensors.
Pre-configured cable tips of the NIVUS sensors or single and multi-wired cables with cross-sectional areas of 0.18–1.5 mm² can be connected to these plugs.

For terminal block connection it is necessary to use a slotted screwdriver with a 3.0 mm or 3.5 mm (0.118-0.138 in) blade.
The terminal clamps are normally unscrewed on delivery. Nevertheless this must be checked before connecting the power supply or the signal wires.

Before the first connection use a screw driver to exert slight pressure on the screw of the clamping connection to ensure safe opening and a correct connection.

Please seal the adapter box with the supplied lid and the screws to secure against ingress of water.

5.5.1 Power Supply

Depending on the type of adapter box used, it can be supplied with 230 V AC (Type AC). Also possible is a 24 V or a 12 V DC supply (Type DC).

A 12 V or 24 V DC box cannot be operated with alternating current, just as it is impossible to operate a 230 V AC box with direct current.

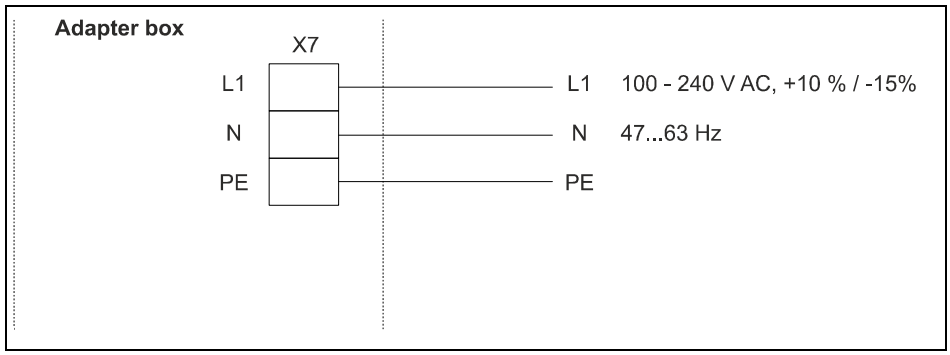


Fig. 5-15 AC model power supply

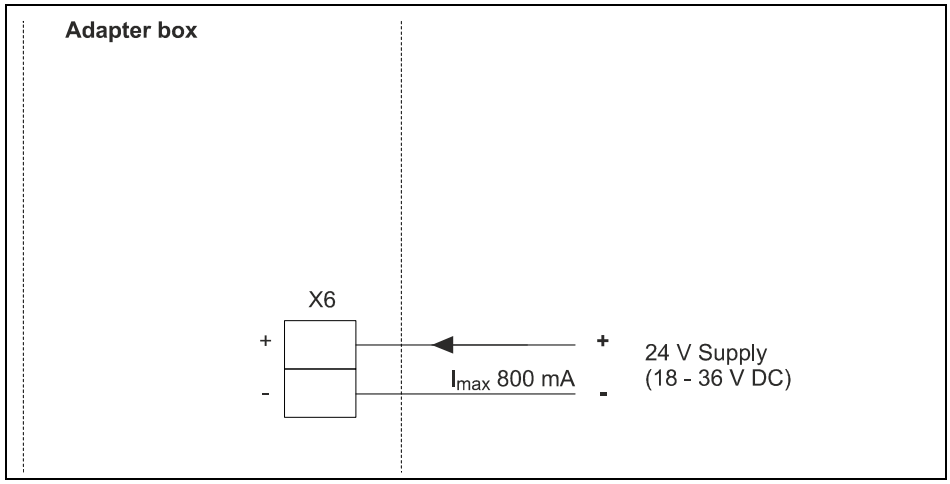


Fig. 5-16 24 V DC model power supply

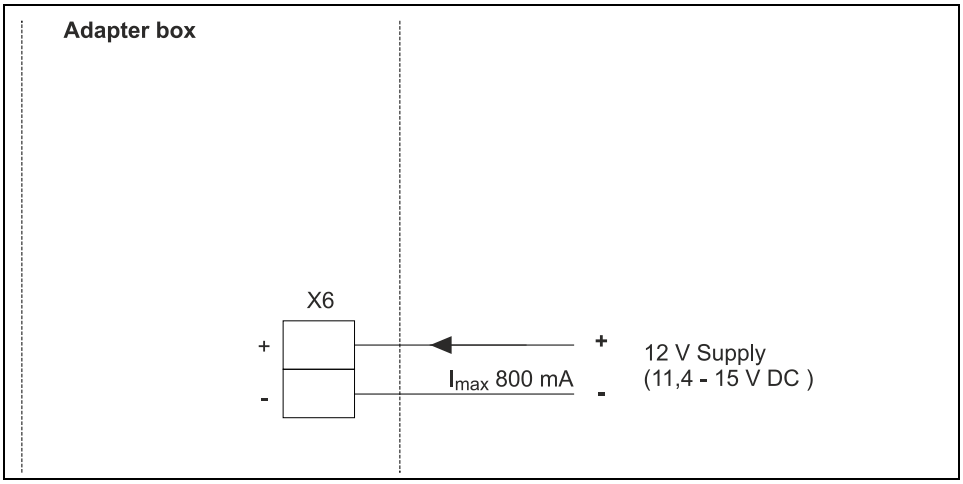


Fig. 5-17 12 V DC model power supply

5.5.2 Overvoltage Protection Precautions

For effective protection of the adapter box it is necessary to protect power supply using overvoltage protection devices.
NIVUS recommends surge arrestors types EnerPro 220Tr, EnerPro 24Tr (for 12 and 24 V DC)

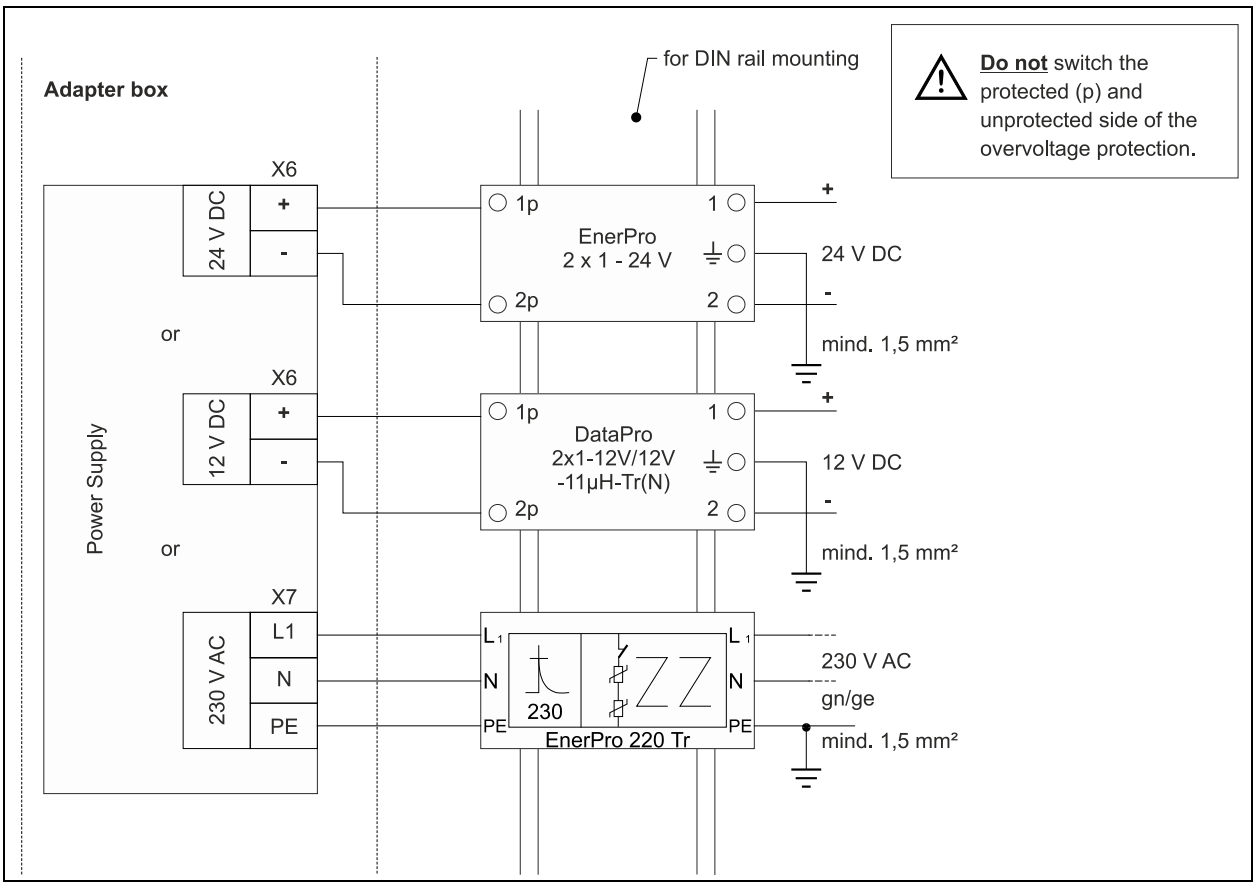


Fig. 5-18 Connecting the overvoltage protection

5.6 Adapter Box Connection

Please observe the succession below in case of installation carried out by NIVUS or NIVUS authorised companies:

1. Unscrew the cover with cable glands.
2. Remove cover with cable glands. Attention! The connection board is on the other side.

Fig. 5-19 cover with cable glands for 4 paths

3. Open used cable glands and remove gland sleeves.
4. Peel off the transparent tape of the cable shield

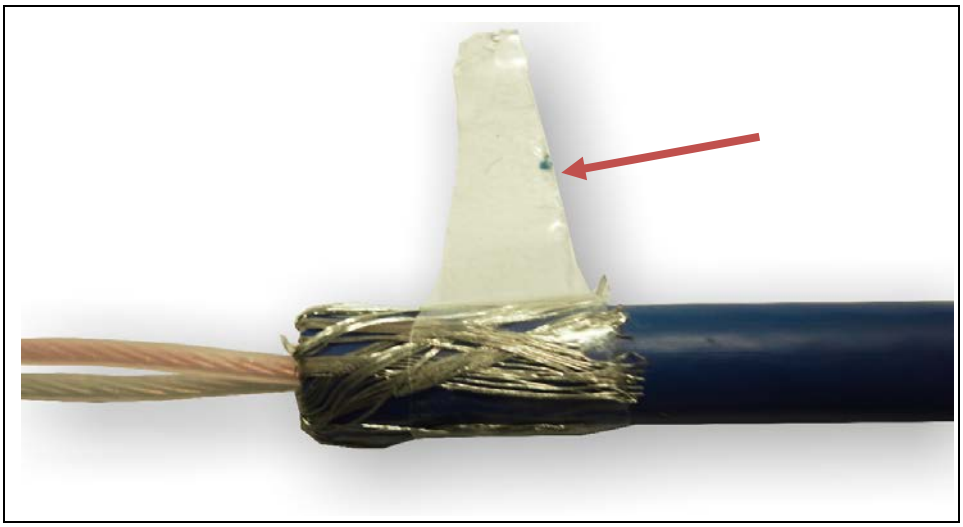


Fig. 5-20 Peel off the transparent tape

5. Push sensor cable through outside cable gland and gland sleeves (metal and rubber).

Fig. 5-21 Sensor cable with screw connection sleeves

6. Induct cable with gland sleeve through cable gland.

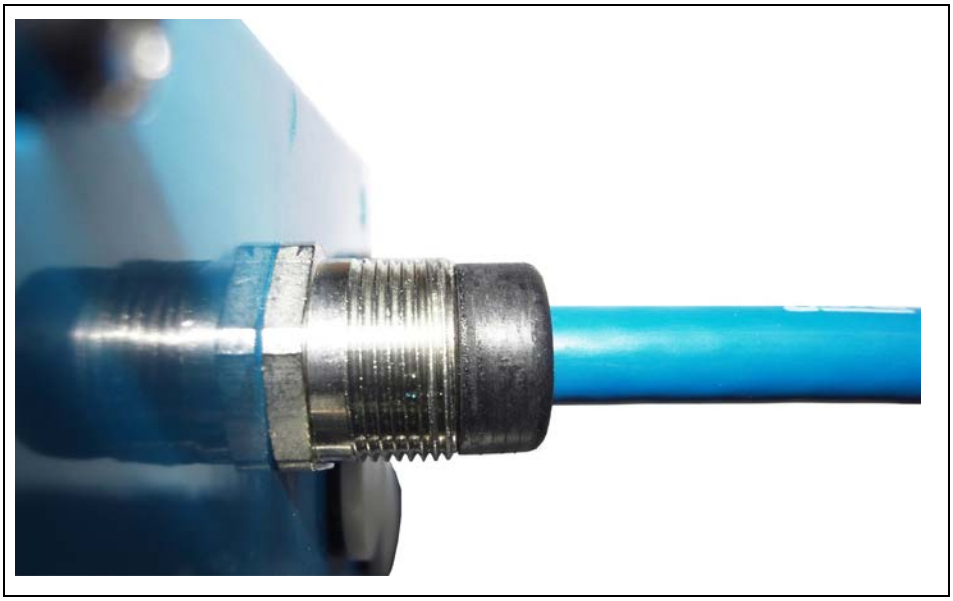


Fig. 5-22 Inserted sensor cable – detailed outside view

7. Sensor shield must be positioned exactly on the inside of the cable gland. Then fasten the cable gland from the outside

When tightening the gable glands please observe to exactly place the cable shield underneath the metal sleeve! Otherwise safe shielding is not guaranteed!

Fig. 5-23 Inserted sensor cable - inside view

8. Connect coppery coloured strand (+) and silver-coloured strand (-) according to the connection diagram (see Fig. 5-5) to pluggable connection block. This process must be made for each sensor cable, connection cable as well as power supply cable.

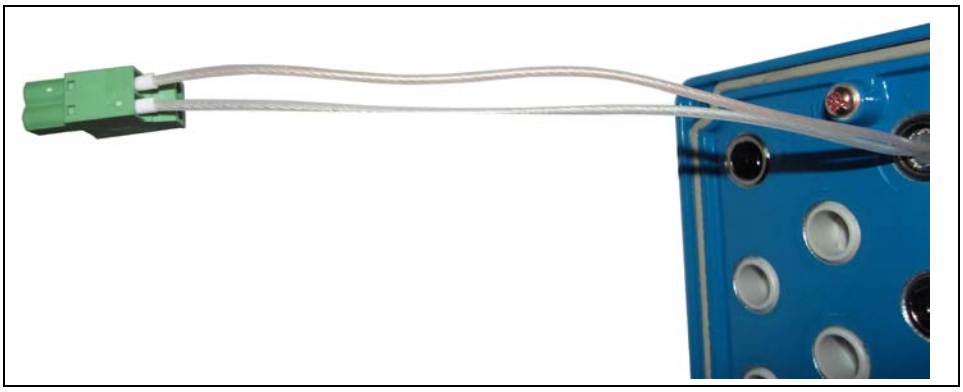


Fig. 5-24 Clamp installation with terminal block

9. Pin terminal blocks on connection board in accordance with the connection diagram in Fig. 5-5

Fig. 5-25 General view sealing cover with connection board

Fig. 5-26 Inserted sensor cable - exterior view path 1

10. Carefully lock the cover after all sensor cables, connection cables and the power supply have been connected. Doing this, please observe not to pinch any wires between cover and enclosure.
11. Install adapter box on sufficient holder or weatherproof cover in a way that the cable glands look down towards the ground (see Fig. 5-27).

Fig. 5-27 Suggested installation of adapter box

6 Troubleshooting

Error	Possible Reason	Correction
No indication of flow (>0< or >----<)	Connection of sensor cable	Check sensor cable and terminal strip in the adapter box
	Connection of connecting cable	Check connection cabel between measurment transmitter and adapter box.
interfering signals are too high	Connection of sensor shield	Check cable shield at cable gland.

7 Maintenance and Cleaning

Maintenance extents as well as the according cycles depend on the following factors:

- material wear
- general regulations for the operator of this measurement plant
- ambient conditions

To ensure reliable, accurate and error-free function of the complete measurement system, we recommend annual inspections of the entire measurement system by NIVUS.

The adapter box is designed to be virtually maintenance-free, free of material wear and does not need to be calibrated. If required clean the enclosure with a dry, lint-free cloth. For heavy pollution NIVUS recommends the use of commercial detergents or surface-active agents. Using abrasive cleansing agents is not allowed.

If you wish to clean the enclosure surface with a damp cloth please disconnect the unit from mains before.

8 Emergency

In case of emergency

- press the emergency-off button of the main system.

9 Dismantling/Disposal

The device shall be disposed according to the local regulations for electronic products.

10 Table of Pictures

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DE / EN / FR

EU Konformitätserklärung

EU Declaration of Conformity

Déclaration de conformité UE

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

For the following product:

Le produit désigné ci-dessous:

Bezeichnung:	**Zwischenbox für NivuSonic und NivuChannel**
Description:	*adapter box for NivuSonic and NivuChannel*
Désignation:	*box indermédiaire pour NivuSonic et NivuChannel*
Typ / Type:	**NIZ-...**

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:

nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:

- 2014/30/EU
- 2014/35/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:

- EN 61000-6-2:2005
- EN 61000-6-4:2007/A1:2011
- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019

Diese Erklärung wird verantwortlich für den Hersteller:

This declaration is submitted on behalf of the manufacturer:

Le fabricant assume la responsabilité de cette déclaration:

NIVUS GmbH
Im Taele 2
75031 Eppingen
Germany

abgegeben durch / *represented by / faite par:*

Ingrid Steppe (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 25.10.2022

Gez. *Ingrid Steppe*

UK Declaration of Conformity

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

For the following product:

Description:	**Adapter box for NivuSonic and NivuChannel**
Type:	**NIZ-...**

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

- SI 2016 / 1091 The Electromagnetic Compatibility Regulations 2016
- SI 2016 / 1101 The Electrical Equipment (Safety) Regulations 2016
- SI 2012 / 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 61000-6-2:2005
- BS EN 61000-6-4:2007/A1:2011
- BS EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019

This declaration is submitted on behalf of the manufacturer:

NIVUS GmbH
Im Taele 2
75031 Eppingen
Germany

represented by:
Ingrid Steppe (Managing Director)

Eppingen, 25/10/2022

Signed by *Ingrid Steppe*