Technical Description for

Ex-Separator Module iXT0

2nd Version

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Copyrights and property rights

Important Note

This manual may exclusively - even in parts - be copied or translated in any other way with the express written consent of NIVUS GmbH.

Translation

If the device is sold to a country in the European Economic Area (EEA) this manual 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 manual (German) must be consulted or the manufacturer contacted for clarification.

Copyright

Names

The use of general descriptive names, trade names, trademarks and the like in this manual 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.

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General

Important note

READ CAREFULLY BEFORE USE.

KEEP IN A SAFE PLACE FOR LATER REFERENCE.

This manual is an original instruction for Ex-Separator Module iXT0 and is for the intended use (see chapter “5 Intended use”) of the device. This manual is oriented exclusively to qualified expert personnel.
Read this instruction manual carefully and completely prior to installation and connection since it contains relevant information on this product. Observe the notes and particularly follow the warning notes and safety instructions.
Keep this manual in a safe place and make sure it is available for the users of this product at any time.
If you should have problems to understand information contained within this manual either contact the manufacturer or one of the distributors for further support. The manufacturer cannot be held responsible for damage to persons or material due to incorrectly understood information in this instruction.

Detailed information on how to operate the complete system can be found in the accompanying instruction manuals of the concerning NIVUS Transmitters, Sensors etc.

Name/Term

The Ex-Separator Module iXT0 in this technical instruction is hereinafter called iXT0.

1 Applicable documentation

For the installation and operation of the complete system extra instruction manuals or technical descriptions may be required apart from this manual.

- Instruction manual for the flow measurement units NivuFlow 550/750/7550
- Technical Instructions for correlation sensors and Electronic box
- Installation Instruction for correlation and Doppler sensors
- Technical and Installation Instruction for Radar sensors OFR

These manuals are provided with the auxiliary units or sensors and/or are available as download on the NIVUS homepage.

2 Signs and definitions used

Image	Meaning	Remark
➲	(Action) Step	Action to be performed by you. Note the numbering of action steps. Observe the order of the working steps!
⇨	Cross-reference	Reference to further or detailed information.
>Text<	Parameter or Menu	Indicates a parameter or a menu that is selected or described.
	Reference to document	Refers to an accompanying documentation.

Table 1 Documentation structure

3 Colour code for wires and single conductors

The abbreviations of colours, wire and components follow the international colour code according to IEC 757.

BK	black	RD	red	TR	transparent
BU	blue	WH	white	GNYE	green/yellow
GN	green	YE	yellow	BN	brown
GY	grey	PK	pink		

Safety instructions

4 Used signs and definitions

The general warning symbol indicates the risk of personal injuries or death. In the text section the general warning symbol is used in conjunction with the signal words described below.

DANGER

Hazard warnings

Indicates an immediate high risk which may result in death or severe personal injury if not avoided.

WARNING

Warning of danger to persons

Indicates a possible danger with moderate risk which may result in death or (severe) personal injury if not avoided.

CAUTION

Warning of personal injuries or material damage

Indicates a possible danger with moderate risk which may result in minor or moderate personal injury or material damage if not avoided.

DANGER

Danger of electrical shock

Indicates a possible danger by electrical power with high risk which may result in death or severe personal injury if not avoided.

Important Note

Indicates situations that may result in damage to property and/or loss of data, if not avoided.

Contains information that needs to be highlighted.

Note

Indicates situations that do not result in personal injury.

4.1 Safeguards and precautions

WARNING

Germ contamination

Please note that due to the operation in the waste water field the measurement system and cables may be loaded with dangerous disease germs. Respective precautionary measures must be taken to avoid damage to one's health.

Wear protective clothing.

WARNING

Observe regulations for health and safety at work

Before starting installation work, observing the work safety regulations need to be checked.

Failure to do so may cause personal injury.

WARNING

Do not disable safety devices!

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

Failure to observe may cause personal injury as well as to system damage.

WARNING

Check hazards due to explosive gases

Prior to beginning mounting works observe to follow any regulations on safety at work and check possible risks due to explosive atmospheres.

While working in channel systems observe to avoid electrostatic charge:

- *Avoid unnecessary movement to reduce the risk of building up electrostatic charge.*
- *Discharge possible electrostatic charge from your body before you begin to install the sensor.*

Disregarding may lead to personal injury or damage your facilities.

4.2 Personnel requirements

Installation, commissioning and maintenance shall be executed only by personnel meeting the demands as follows:

- Expert personnel with relevant training an appropriate qualification
- Personnel authorised by the plant operator

Qualified personnel

within the context of this documentation or the safety notes on the product itself are persons who are sufficiently familiar with installation, mounting, starting up and operation of the product and who have the relevant qualifications for their work; for example:

I. Training, instruction or authorisation to activate/deactivate, isolate, ground and mark electric circuits and devices/systems according to the safety engineering standards.

II. Education and instruction according to the standards of safety engineering regarding the maintenance and use of adequate safety equipment.

III. First aid training

5 Intended use

Important Note

The Ex-Separator Module iXT0 is exclusively intended to be used for purposes as described below.
Modifying or using the devices for other purposes without the written consent of the manufacturer will not be considered as use in accordance with the requirements.
Damages resulting from this are left at user's risk.

The iXT0 is for the connection of NIVUS sensors (specified in chapter "11 Functional descriptions") for use in Ex zone 1.
The iXT0 is engineered and manufactured according to the current state of the art as well as to recognised safety regulations. Danger to persons or material, however, cannot be completely ruled out.
Strictly observe the maximum permissible limit values of the iXT0 as specified in chapter "8 Specifications". Any applications deviating from the aforementioned limit values without the written authorisation by NIVUS GmbH are left at user's risk.

Ex-Identification

- **ATEX:** II (2) G [Ex ib Gb] II B

- **IECEx:** [Ex ib Gb] II B

CAUTION

Damages invalidate the Ex protection

Damage might invalidate the Ex protection.
The iXT0 then is not allowed to be used any longer.

Protect the iXT0 from shocks, drops or other damage.

Important Note

Install the iXT0 outside of the Ex zone!

Important Note

The Ex approval is only valid in connection with the respective indication on the device nameplate.

The Ex-version of Separator Module iXT0 is matched to the NIVUS sensors regarding the assessment of intrinsically safe electrical systems according to EN 60079-25.

The required specifications for Ex-version sensors can be taken from the EC-type examination certificate TÜV 03 ATEX 2262 or TÜV 12 ATEX 087812.

Note

For installation and commissioning observe the following points:

- *EU Declaration of Conformity*
- *Test certificates of the respective authorities*
- *Applicable local regulations*

5.1 User's responsibilities

Important Note

In the EEA (European Economic Area) national implementation of the framework directive 89/391/EEC and corresponding individual directives, in particular the directive 2009/104/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.

The customer must (where necessary) 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

As an operator make sure prior to activating the iXT0 that during installation and initial start-up, if executed by the operator himself, the local regulations (such as regulations for electrical connection) are observed.

5.1.1 Keep the manual

Keep this manual in a safe place and make sure it is available for the users of this product at any time.

5.1.2 Provide the manual

In case of selling the instrument this manual shall be provided to the purchaser since it is a part of the standard delivery.

6 Liability disclaimer

The manufacturer reserves the right to change the contents of this document including this liability disclaimer without prior notice and cannot be held responsible in any way for possible consequences resulting from such changes.

For connection, initial start-up and operation as well as maintenance of the unit the following information and higher legal regulations of the respective country (in Germany e. g. VDE regulations) such as applicable Ex regulations as well as safety requirements and regulations in order to avoid accidents shall be observed.
The safety-related values of the connected iXT0 shall comply with the technical specifications or the specifications contained in the according EC type examination certificate.
Interconnecting several active devices within an intrinsically safe circuit may result in different safe maximum values. In such cases the intrinsic safety may be impaired!

All operations on the device which go beyond installation or connection measures in principle shall be carried out by NIVUS staff or personnel authorised by NIVUS due to reasons of safety and guarantee.

Operate the iXT0 only in technically perfect working order.

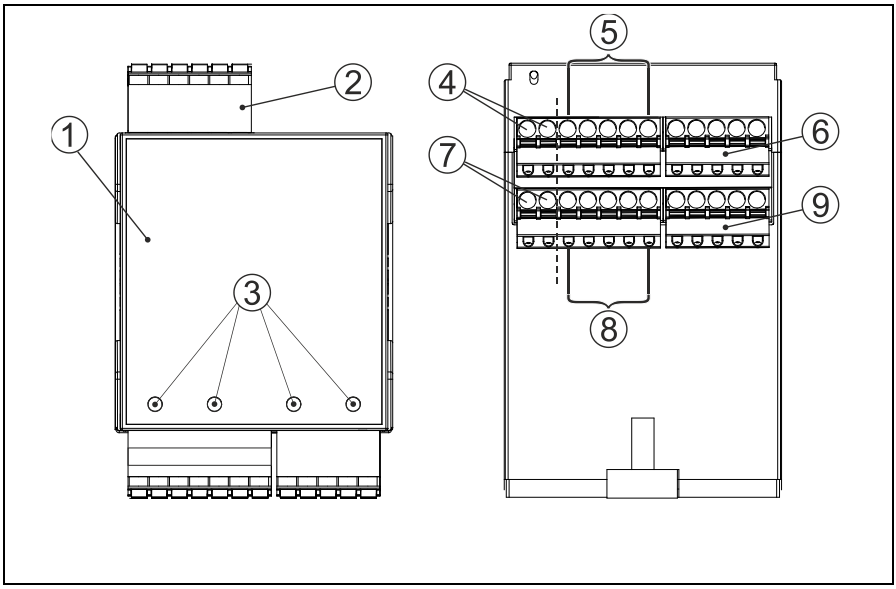
Improper Use

Not being operated in accordance with the requirements may impair the safety.
The manufacturer is not responsible for failures resulting from improper use.

Product description

7 Overview and intended use

7.1 Overview



1 Device enclosure
2 Connection to the transmitter NivuFlow
3 LEDs Sensors (optical voltage signal)
4 Connection 2-wire-sensor 1 (for type 211/421: HART)
5 Connection air ultrasonic sensor type OCL
6 Connection v-sensor 1 (water – cross correlation or surface radar OFR)
7 Connection 2-wire sensor 2 (valid only for iXT04xx)
8 Connection v-sensor 2 (valid only for iXT04xx)
9 Connection v-sensor 3 (valid only for iXT04xx)

Fig. 7-1 Overview of Ex-Separator Module iXT0

7.2 Device identification

All information in this technical instruction is valid only for the type of unit indicated on the title page.
A type label is indicated on the housing and contains the following:

- Name and address of manufacturer
- CE label
- Type labelling and series identification (serial number)
- Year of manufacture
- Ex label (on Ex-version only) as mentioned in chapter “5 Intended use”

It is important for queries and replacement part orders to specify type, year of manufacture and serial number (article no. if necessary). This ensures correct and quick processing.

Note

Check the device nameplate to ensure that the device is delivered according to your order.

Check if the correct supply voltage is printed on the nameplate.

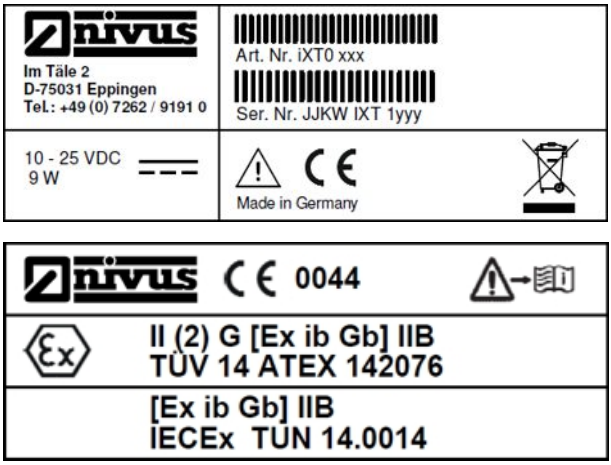


Fig. 7-2 Nameplate of Ex-Separator Module iXT0

7.3 Device versions

The iXT0 is manufactured in different versions which mainly differ by the number of connectable sensors.
The article number can be found on the nameplate which is indicated on the housing.

Type	Description
iXT0210	2x RS485-Sensors + 1x 2-wire sensor
iXT0211	2x RS485-Sensors + 1x 2-wire sensor with HART
iXT0420	4x RS485-Sensors + 2x 2-wire sensors
iXT0421	4x RS485-Sensors + 1x 2-wire sensor with HART + 1x 2-wire sensor

Table 2 Type key of Ex-Separator Module iXT0

8 Specifications

Power supply	12 V DC (from transmitter NivuFlow xxx); For use in connection with equipment in networks up to overvoltage category II or with SELV Ex-technical: U_m = 253 V AC
Power consumption (total)	max. 9 W
Power consumption	max. 1.5 W (typical 1.2 W)
Protection degree	IP20, for installation in areas up to maximum pollution degree 2
Ex-Approval / other approvals	ATEX: TÜV14ATEX142076 IECEx: TUN14.0014
Operating temperature	-20…+40 °C
Storage temperature	-20...+85 °C
Max. humidity	95 %, non-condensing
Inputs (incl. options)	2x analog 4-20 mA loop-powered sensor connection Ex ib Gb IIB, 1 of them HART-compatible Max. values per circuit:

	U_o = 25.4 V / I_o = 89.2 mA / P_o = 566.5 mW 4x sensor connection Ex ib Gb IIB with RS485 interface Max. values per circuit: Supply: U_o = 10.5 V / I_o = 640 mA / P_o = 6.72 W RS485: U_o = 4.1 V / I_o = 105 mA / P_o = 108 mW U_i = 11 V / I_i = 176 mA / P_i = 482 mW Isolation voltage U_m = 253 V AC
Outputs	1x transmitter connection RS485 interface

Table 3 Specifications

Storing

When storing, protect the iXT0 from corrosive or organic solvent vapours, radioactive radiation and strong electromagnetic radiation.

9 Equipment

9.1 Delivery

The standard delivery of the iXT0 contains:

- One Ex-Separator Module iXT0 - according to delivery note
- Technical Instruction with the EC Declaration of Conformity and approvals - where all necessary steps to correctly install and to operate the iXT0 are listed

Check additional accessories depending on your order and by using the delivery note.

9.2 Receipt

Check the delivery according to the delivery note for completeness and intactness immediately after receipt. Report any damage in transit to the carrier instantly. Send an immediate, written report to NIVUS GmbH in Eppingen as well. Incomplete delivery shall be directly reported to the headquarters in Eppingen or your local distributor in written form within two weeks.

Note

Mistakes cannot be rectified later.

9.3 Transport

Protect the iXT0 from shock and impact loads and vibrations. The transportation must be carried out in the original packaging.

9.4 Return

The units must be returned at customer cost to NIVUS Eppingen in the original packaging free of charge.
Returns with insufficient postage will not be accepted.

9.5 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.
Damages caused by using non-original parts and non-original accessories are left at user's risk.

Construction and functions

10 Enclosure dimensions

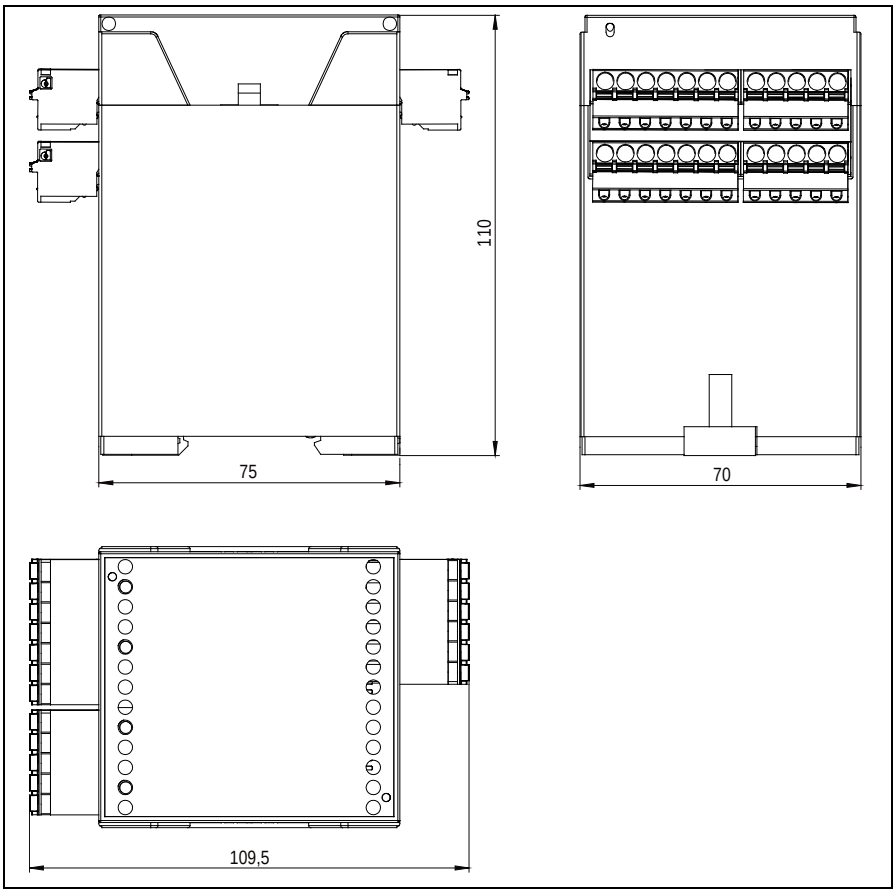


Fig. 10-1 Dimensions DIN rail enclosure

11 Functional descriptions

The iXT0 is an intelligent electronic separation interface which is used between non Ex-area and Ex-zone 1.
The iXT0 is conceived for correct Ex-technical separation of the following sensors:

NIVUS velocity sensors:

- POA-V2
- CS2
- EBM-Box (Electronic box Mini)
- OFR-EV

NIVUS level sensors:

- OCL-L1
- i-series sensor
- NivuCompact
- NivuBar

The iXT0 intrinsically safe supplies the sensors mentioned above with power and ensure reliable data transmission between sensors and the NivuFlow xxx transmitter within the limits of its technical specifications.
The iXT0 draws its required power from the transmitter.

Installation and connection

12 Installation instructions

- Observe appropriate installation.
- Follow applicable legal or operational guidelines.

Inappropriate use may result in injuries and/or damage on instruments.

12.1 Hints to avoid electrostatic discharge (ESD)

ATTENTION

ESD Risks

Maintenance procedures which do not require power supply of the instrument shall not be executed before the unit has been disconnected from mains power in order to minimise danger and ESD risks.

Disconnect the iXT0 from mains power!

The sensitive electronic components inside the unit may get damaged by static electricity. The manufacturer recommends the following steps to prevent the device from getting damaged due to electrostatic discharge.

- Discharge static electricity from your body before touching the instrument's electronic components.
- Avoid unnecessary movements to reduce the risk of building up static electricity.

12.2 Installation place

The iXT0 with DIN rail fastening is conceived for installation in switching cabinets.

- Observe adequate ventilation at the installation place e. g. by using a fan or a heat exchanger.

12.3 Installation guidelines

For safe installation the measures below must be taken:

- Do not subject the iXT0 to excessive vibration or shock
- Do not install the iXT0 close to footpaths or travel ways
- Observe the tolerable ambient air temperature

Strictly avoid when installing the device:

- corrosive chemicals or gases
- radioactive radiation

12.4 Fastening the iXT0

Note

*Mounting materials and tools are **not** parts of the standard delivery.*

- For fastening use a DIN rail type TS35 according to EN 60715 with a minimum length of 70 mm.
- Fasten the rail horizontally in the intended enclosure/switching cabinet by using at least two screws.
- Hook the iXT0 into the DIN rail from above and then is snapped into place diagonally downwards by exerting slight pressure from the front.

13 Electrical installation

WARNING

Disconnect the unit from mains power

All work on electrical connections may only be carried out with the supply voltage turned off.

Observe electrical data specified on the nameplate.

Note

Observe the national installation instructions.

- For electric installation the regulations in the respective countries must be referred to.

- For installation in wet environments or in areas featuring the risk of flooding it may be necessary to install extra protective measures such as a residual current device (RCD) if required.
- Check if the power supply of the units must be integrated into the facility's emergency shutdown conception.
- Transmitters and sensors shall be installed completely before feeding the supply voltage.
- Make sure that the installation is correct.
- The installation shall be carried out by qualified personnel only.
- Legal standards, provisions and technical regulations need to be observed.

13.1 Connection cable

Between sensor and transmitter

For the complete distance between the NIVUS sensors and transmitter NivuFlow xxx use the cable Type

- LiYC11Y 2x1.5 mm² + 1x2x0.34 mm² + PA

if possible.

Between sensor and iXT0

Maximum cable lengths between sensors and iXT0 if using the NIVUS standard cable LiYC11Y 2x1.5 mm² + 1x2x0.34 mm² + PA:

- 150 meters (see Fig. 13-1)
- Use of overvoltage protection elements:
    - Single-side: 135 meters
    - Double-side: 120 meters

Between iXT0 and transmitter

When installing the iXT0 directly in a switching cabinet or a field enclosure with a connection to NivuFlow xxx using individual wires (in a cable duct or similar) note the following:

- Observe to lay power lines and frequency-conducting signal lines separated from each other.
- Use a 2-wire, commonly twisted and shielded telecommunications line with a min. cross section of 0.34 mm² for RxTx-connections.
- Use individual wires with a minimum cross section of 0.75 mm² for power supply.

The maximum cable length in this case is 5 m (see Fig. 13-1).

Use the NIVUS cable LiYC11Y 2x1.5 mm² + 1x2x0.34 mm² + PA

- for longer distances (> 5 m) in switching cabinets/field enclosures
- in case of expected signal interferences

When using a cable Type LiYC11Y 2x1.5 mm² + 1x2x0.34 mm² + PA the maximum distance between iXT0 and the transmitter is

- 100 m (see Fig. 13-2)
- Use of NIVUS overvoltage protection elements at one or both ends of the line:
    - o no influence

For distances > 100 m between iXT0 and NivuFlow xxx transmitters use a telecommunications cable Type A2Y(L)2Y 12x2x0.8 (or higher wire pair) or technically adequate types (see Fig. 13-3).
In such cases observe to extend both RxTx signal cables using one common twisted wire pair.

To supply iXT0 and sensors with power several wires shall be connected parallel. The number of wires required depends on the distance between iXT0 and the NivuFlow xxx transmitter.
Note the table below:

Cable length [m]	Min. number of wires required for power supply and ground	Total number of wires required for extension (without reserve)
0 – 75	2 each	6
76 – 100	3 each	8
101 – 125	4 each	10
126 – 150	5 each	12
151 – 200	6 each	14
201 – 250	8 each	18
250 - 300	10 each	22

Table 4 Number of wires when using A2Y(L)2Y 12x2x0.8

Higher numbers of individual wires need to be combined electrically in a short distance before entering iXT0 and NivuFlow xxx and shall be laid as individual wire with a maximum cross section of 2.5 mm² (clamp or solder connection).

Note

Do not connect more than one wire per cage clamp terminal on iXT0 and NivuFlow xxx.

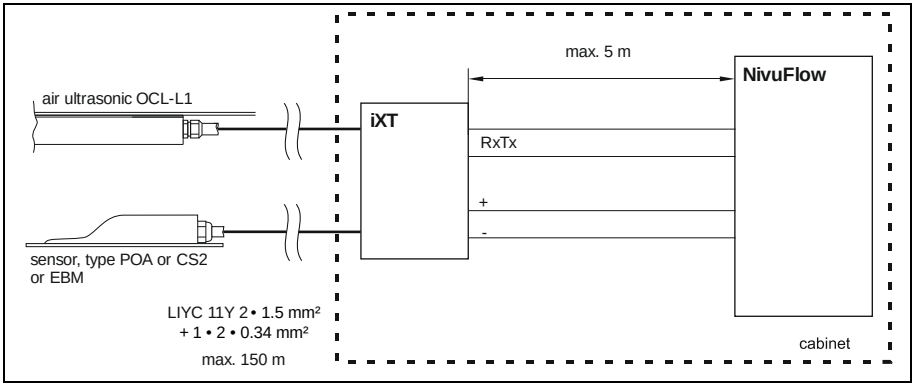


Fig. 13-1 Connection velocity sensor – iXT0

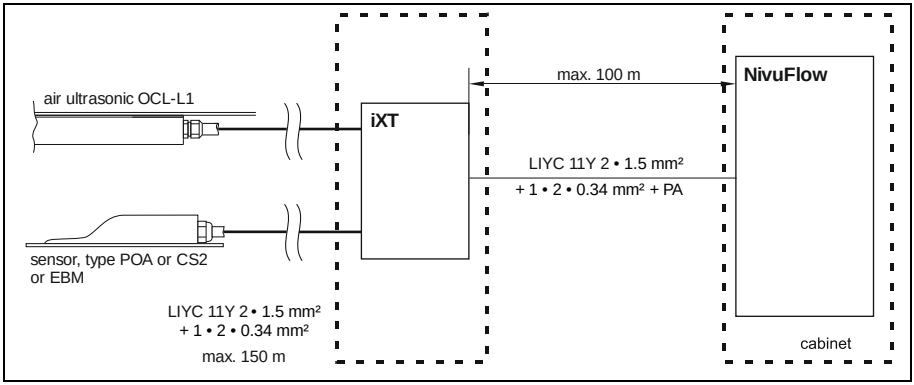


Fig. 13-2 Connection iXT0 – NivuFlow xxx with NIVUS signal cable

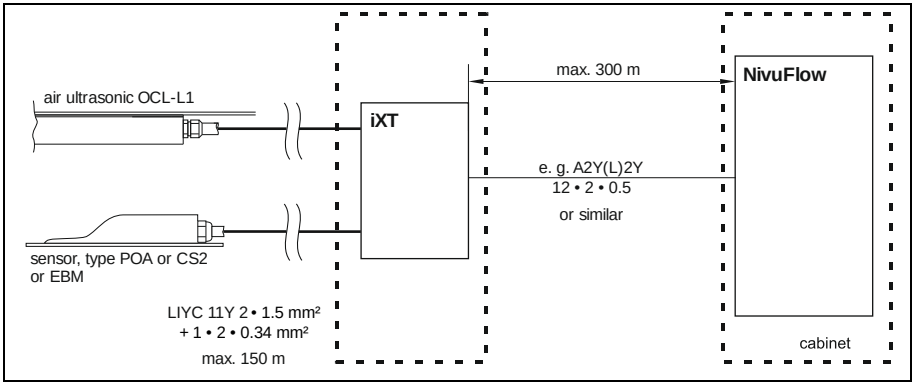
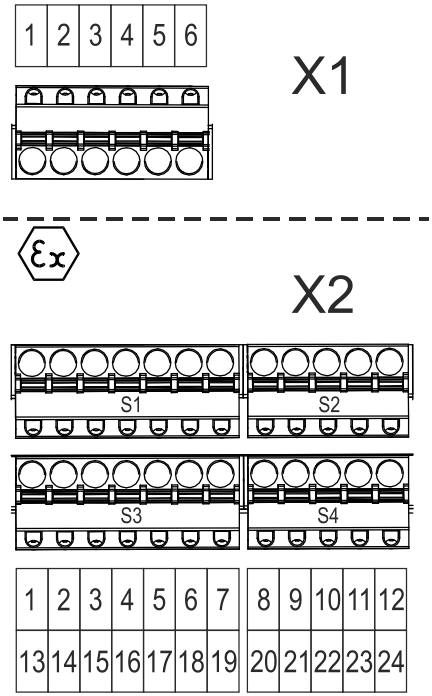


Fig. 13-3 Connection iXT0 – NivuFlow xxx with telecommunications cable

13.2 Wiring diagram



Terminal block X1 (green)	
1	Rx/Tx +
2	Rx/Tx -
3	GND
4	12 V DC
5	Shield
6	PE (Ground)

Terminal block X2 (blue)		
1	mA 1 +	13 mA 2 +
2	mA 1 -	14 mA 2 -
3	Shield	15 Shield
4	S1 PWR +	16 S3 PWR +
5	GND-Ex	17 GND-Ex
6	S1 Rx/Tx -	18 S3 Rx/Tx -
7	S1 Rx/Tx +	19 S3 Rx/Tx +
8	Shield	20 Shield
9	S2 PWR +	21 S4 PWR +
10	GND-Ex	22 GND-Ex
11	S2 Rx/Tx -	23 S4 Rx/Tx -
12	S2 Rx/Tx +	24 S4 Rx/Tx +

Fig. 13-4 Terminal wiring diagram for iXT0, type 420/421

The X1 terminal block section is designed for connection to a NIVUS transmitter. How to connect the six sensors is described in the X2 terminal block section.

Fig. 13-4 shows a separator module for the connection of up to 3 flow velocity sensors. Type 210/211 is not equipped with S3 and S4 plug terminal rails.

Note

For electrical connection observe the device configuration. One copper wire with a maximum cross section of 2.5 mm² can be connected per clamp.
Connection is made by using spring plug terminal clamps.

13.3 Sensor connection to Ex-Separator Module iXT0

The sensor cable is connected to the iXT0 in the terminal block section X2.

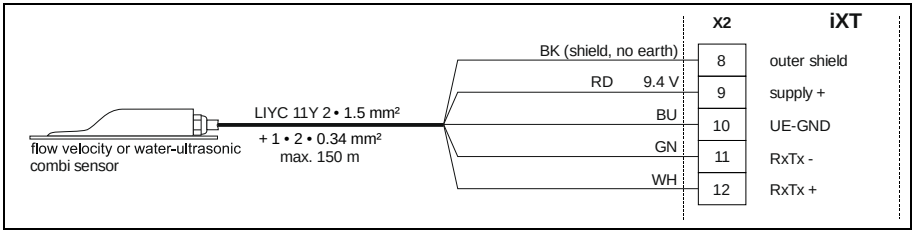


Fig. 13-5 Flow velocity or water-ultrasonic-combi sensor to iXT0 2xx/4xx

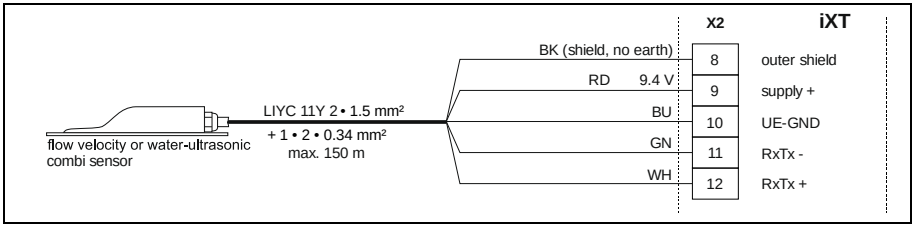


Fig. 13-6 Flow velocity sensor with pressure measurement cell to iXT0 2xx/4xx

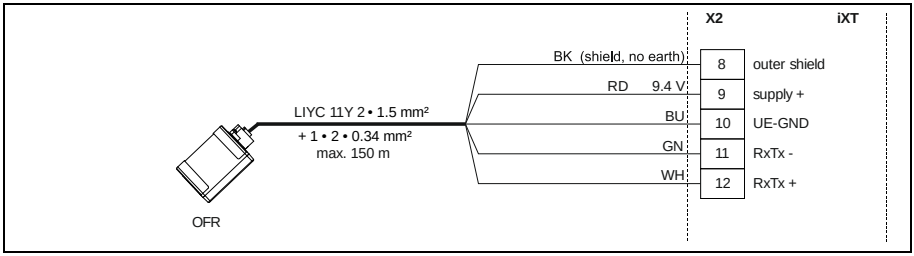


Fig. 13-7 Radar sensor OFR to iXT0 2xx/4xx

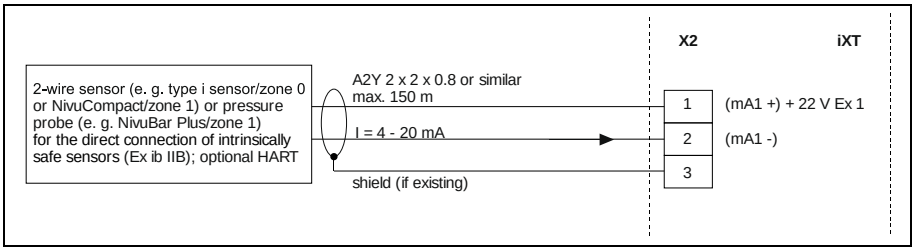


Fig. 13-8 1st 2-wire probe for level measurement to iXT0 2xx/4xx Ex

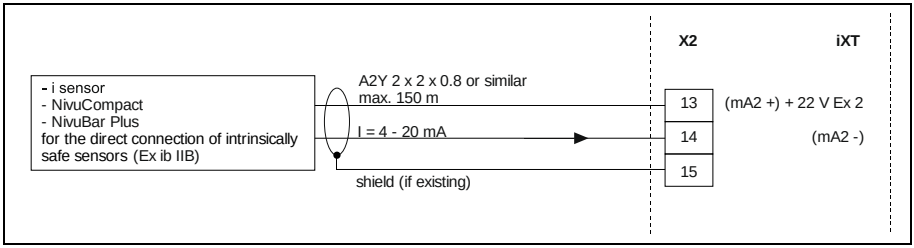


Fig. 13-9 2nd 2-wire probe for level measurement to iXT0 4xx

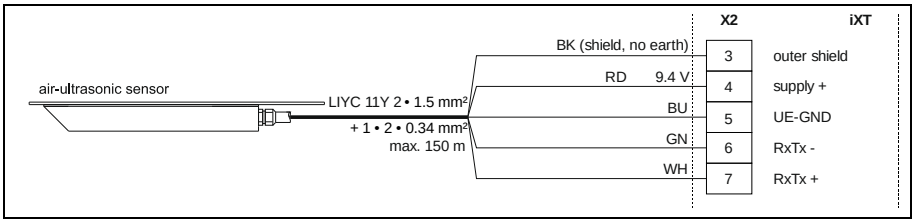


Fig. 13-10 Air-ultrasonic sensor Type OCL to iXT0 2xx/4xx

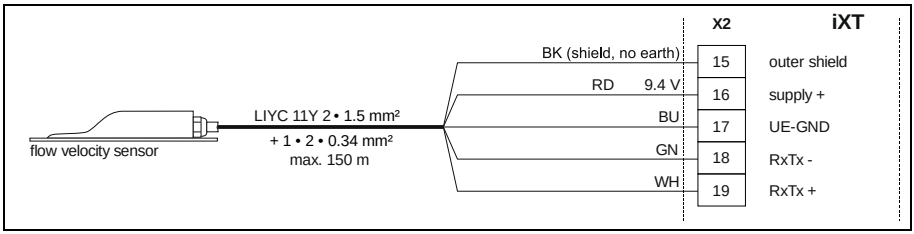


Fig. 13-11 2nd flow velocity sensor to iXT0 4xx

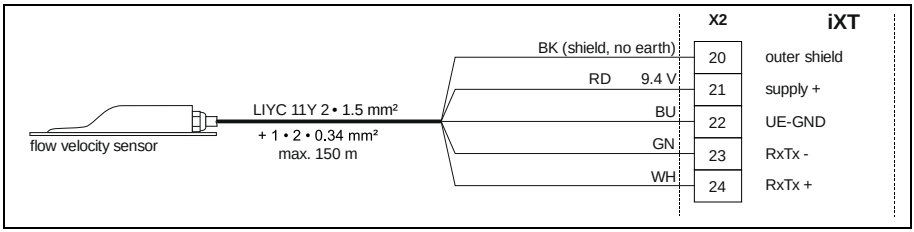


Fig. 13-12 3rd flow velocity sensor to iXT0 4xx

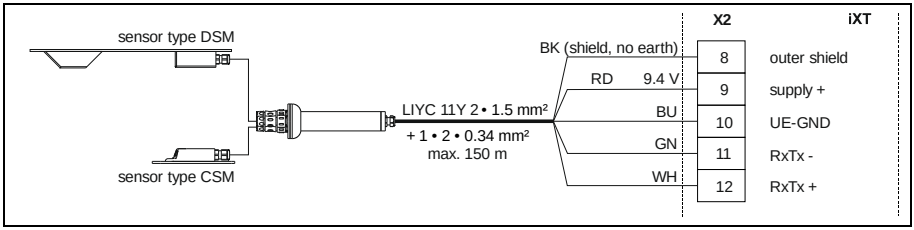


Fig. 13-13 Electronic Box EBM with water-ultrasonic sensor CSM and air-ultrasonic DSM to iXT0 2xx/4xx

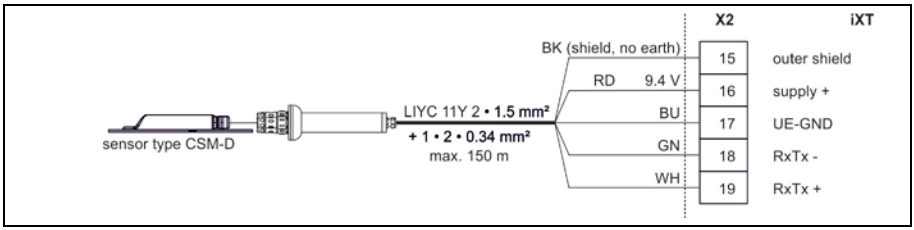


Fig. 13-14 2nd Electronic Box EBM with water-ultrasonic sensor CSM-D to iXT0 4xx

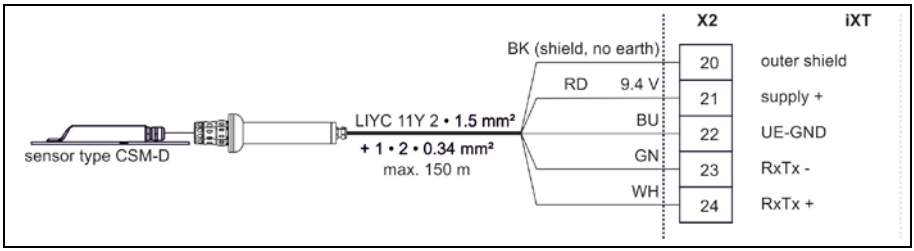


Fig. 13-15 3rd electronic Box EBM with water-ultrasonic sensor CSM-D to iXT0 4xx

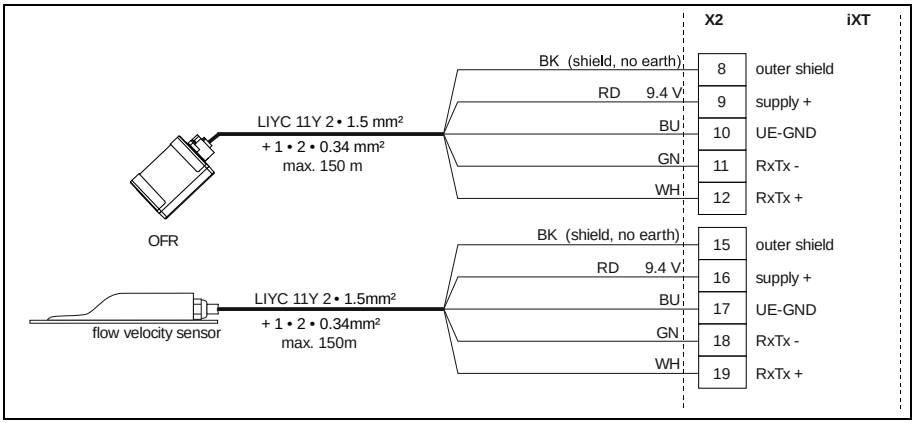


Fig. 13-16 Radar and cross correlation flow velocity sensor to iXT0 4xx (only N7550)

13.4 Connection of iXT0 to NivuFlow transmitters

To identify the transmitter type, see the unit's nameplate.

To connect cables observe the notes in chapter "13.1 Connection cable" as well as Fig. 13-1 to Fig. 13-3.

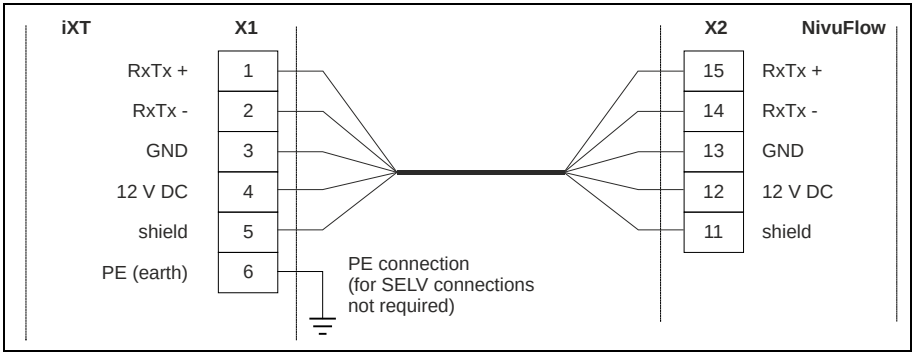


Fig. 13-17 iXT0 to NF750-S1/SR

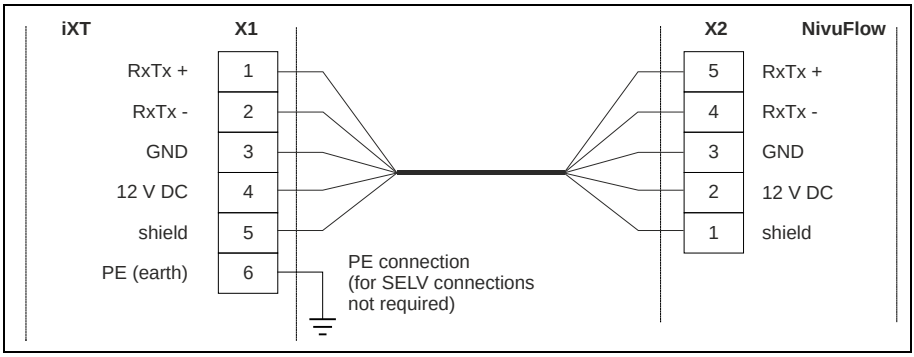


Fig. 13-18 iXT0 to NF750-M3, N7550 or 1st iXT0 to NF750-M9

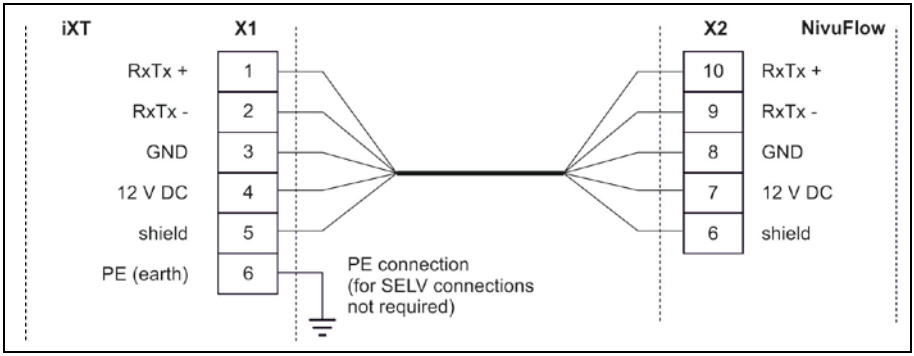


Fig. 13-19 2nd iXT0 to NF750-M9

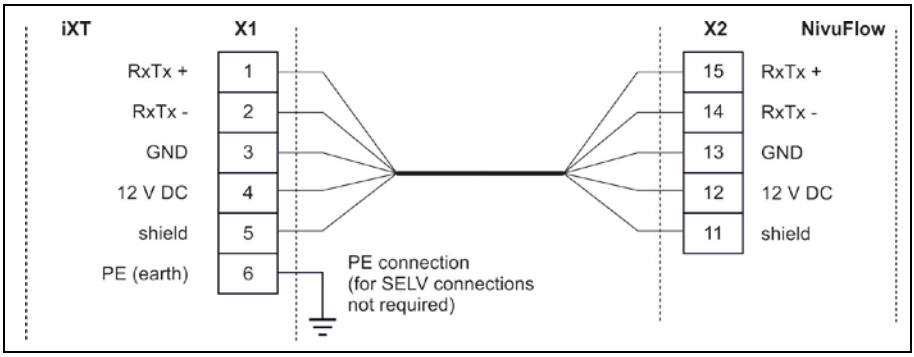


Fig. 13-20 3rd iXT0 to NF750-M9

14 Overvoltage protection

For effective protection of the Ex-Separator Module iXT0 it is necessary to protect power supply as well as mA-inputs and mA-outputs using overvoltage protection devices. NIVUS recommend:

- 2-wire connection:
  DataPro 2x1 24/24
- RS485-Sensors (POA, CS2, OCL and OFR):
  DataPro 2x1 12/12
  SonicPro 3x1 24/24

The flow velocity sensors, the OCL air-ultrasonic sensors and the radar sensor are internally protected against overvoltage within the usual EMC limits. Should you expect higher risk potentials protect the sensors by using the following combination:

- DataPro 2x1 12/12 in connection with SonicPro 3x1 24/24

Note

Consider the connected loads of the overvoltage protection devices when using the sensors in Ex areas.

Please also ensure the capacity and inductance of the NIVUS sensor cables (POA, CS2, OCL, OFR and EBM).

The maximum permissible NIVUS cable lengths in Ex areas are:

- *single-side overvoltage protection: 135 m (443 ft.)*
- *double-side overvoltage protection: 120 m (394 ft.).*

Note

Observe the non-reversed connection (p-side to transmitter) as well as a correct, straight wiring supply.

Ground (earth) must lead to the unprotected side.

- *Wrong connection suspends the function of the overvoltage protection!*

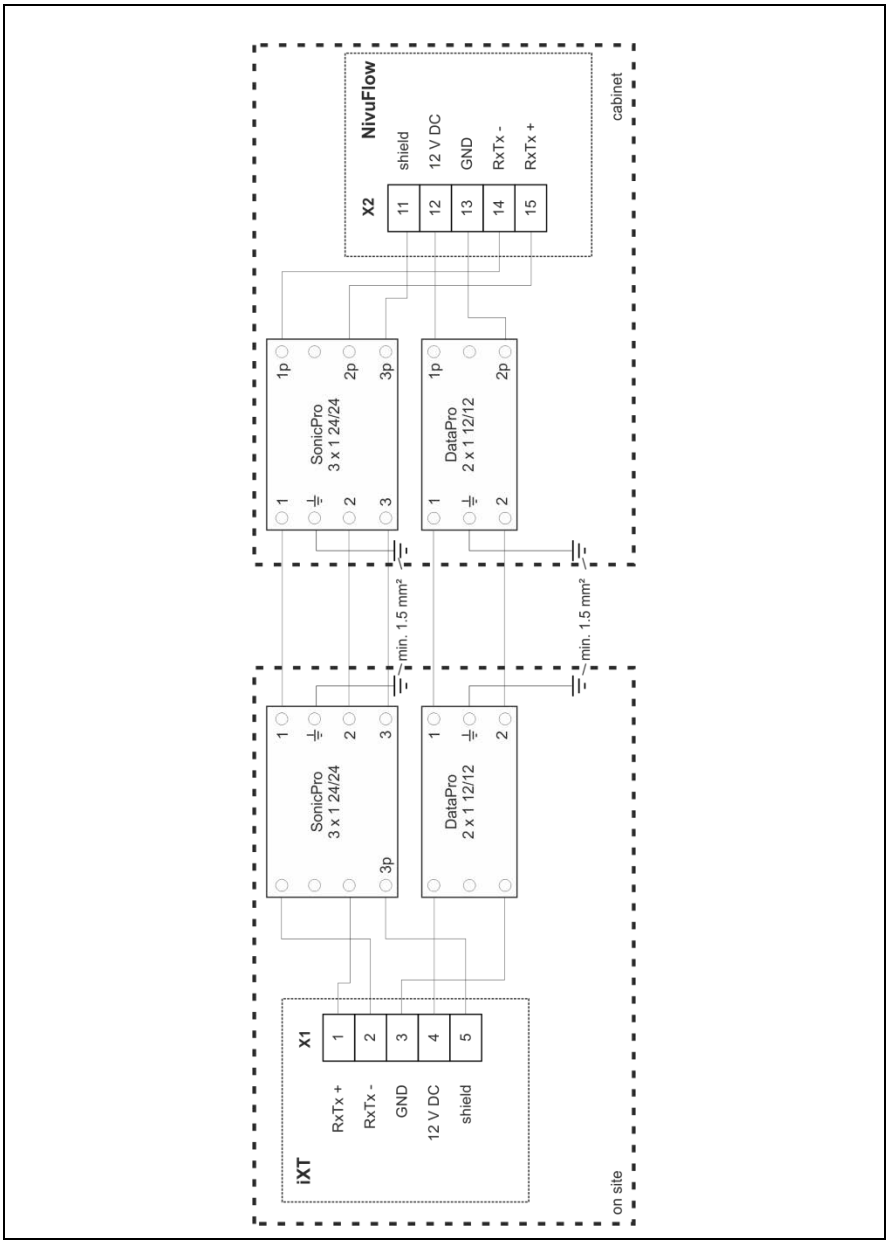


Fig. 14-1 **Double-side overvoltage protection between iXT0 and NivuFlow 750-S1/SR**

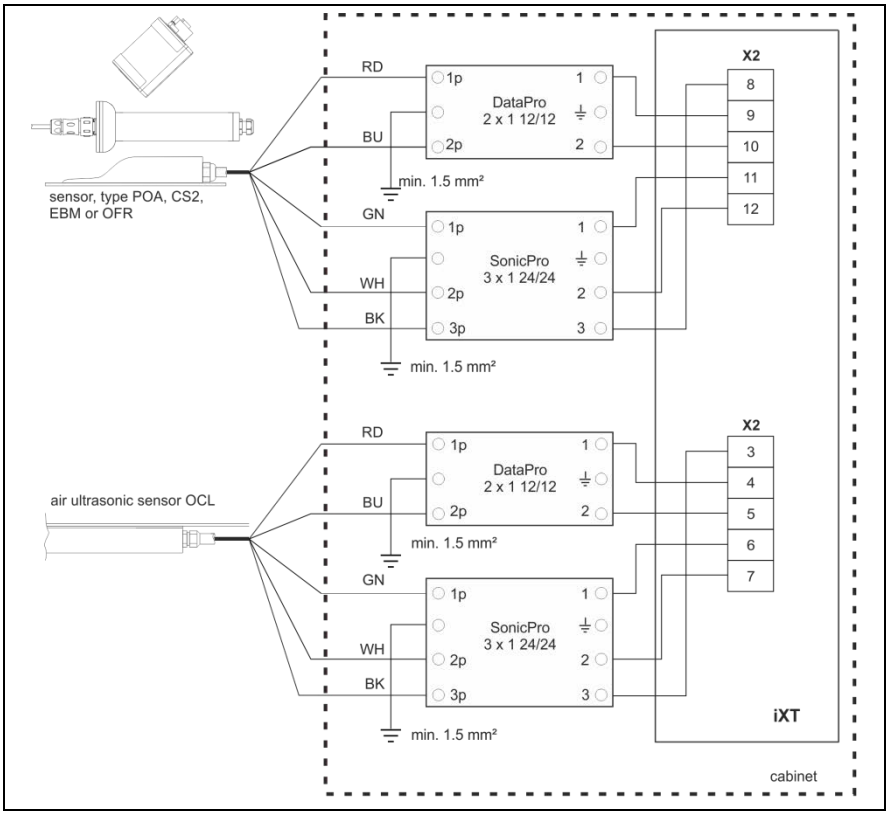


Fig. 14-2 Overvoltage protection sensors to iXT0

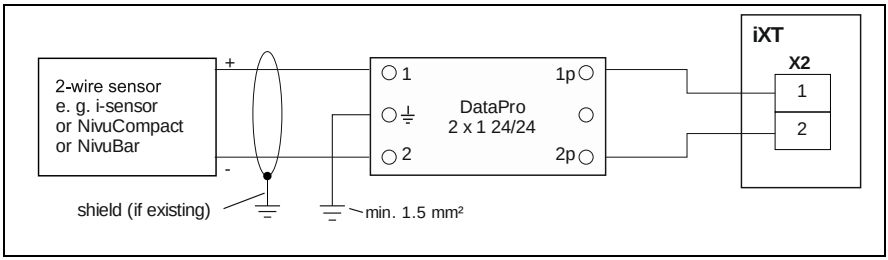


Fig. 14-3 Overvoltage protection 2-wire sensor to iXT0

Maintenance and cleaning

15 Maintenance, material wear and cleaning

Disconnect instrument from mains

Disconnect the instrument from power supply before you begin to execute maintenance, cleaning and/or repair works. Repair works shall be executed solely by expert personnel.

Disregarding may lead to electrical shocks.

The iXT0 is designed to be virtually maintenance-free and free of material wear.
If required clean the enclosure with a dry antistatic cloth.
Do not use any abrasive cleansing agents.

16 Dismantling/disposal

Improper disposal may be harmful to the environment.
Always dispose equipment components and packaging materials according to applicable local regulations on environmental standards for electronic products.

- Disconnect the iXT0 from mains power.
- Use appropriate tools to remove the connected cables of the iXT0.
- Remove the iXT0 from the DIN rail.

EC WEEE-Directive

This symbol indicates that the Directive 2012/19/EU on waste electrical and electronic equipment requirements shall be observed on the disposal of the equipment.

17 Emergency

In case of emergency press the **emergency-off button** of the main system.

Certificates and approvals

This technical description uses the designations X1 (to transmitter) or X2 (to sensors) for the terminal clamps according to chapter “13.2 Wiring diagram”.
For the EC type examination certificate the internal electrical diagrams of the iXT0 modules have been filed. These diagrams use the designations X2, X3, X4, X5 and X6 for the externally accessible terminal strips.
This is why in the EC type examination certificate the latter references are quoted instead of the designations used in this technical description.

Allocation of connections:

- First line - designation of the function according to chapter 13.2
- Second line (TB) - respective clamp no. on the iXT0
- Third line (BMP) - designation as used in the following EC type examination certificate

Transmitter connection (non-Ex-area):

	Rx/Tx +	Rx/Tx -	GND	12 V DC	shield	PE (earth)
TB:	X1. 1	X1. 2	X1. 3	X1. 4	X1. 5	X1. 6
BMP:	X2, 1	X2, 2	X2, 3	X2, 4	X2, 5	X2, 6

Sensor connection for plugs S1, S2, S3 and S4 (Ex-area, zone 1):

S1	mA 1 +	mA 1 -	shield	S1 PWR +	GND-Ex	S1 Rx/Tx -	S1 Rx/Tx +
TB:	X2.1	X2.2	X2.3	X2.4	X2.5	X2.6	X2.7
BMP:	X4, 7	X4, 6	X4, 5	X4, 4	X4, 3	X4, 2	X4, 1

S2	shield	S2 PWR +	GND-Ex	S2 Rx/Tx -	S2 RX/TX +
TB:	X2.8	X2.9	X2.10	X2.11	X2.12
BMP:	X3, 5	X3, 4	X3, 3	X3, 2	X3, 1

S3	mA 2 +	mA 2 -	shield	S3 PWR +	GND-Ex	S3 Rx/Tx -	S3 Rx/Tx +
TB:	X2.13	X2.14	X2.15	X2.16	X2.17	X2.18	X2.19
BMP:	X6, 7	X6, 6	X6, 5	X6, 4	X6, 3	X6, 2	X6, 1

S4	shield	S4 PWR +	GND-Ex	S4 Rx/Tx -	S4 Rx/Tx +
TB:	X2.20	X2.21	X2.22	X2.23	X2.24
BMP:	X5, 5	X5, 4	X5, 3	X5, 2	X5, 1

Translation

(1) # EC-Type-Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 94/9/EC**

(3)	**Certificate Number**	**TÜV 14 ATEX 142076**
(4)	for the equipment:	Ex-Separator-Module type iXT0-xxx
(5)	of the manufacturer:	NIVUS GmbH
(6)	Address:	Im Täle 2 75031 Eppingen Germany
	Order number:	8000434847
	Date of issue:	2014-09-24

(7) The design of this equipment or protective system and any acceptable variation thereto are specified in the schedule to this EC-Type-Examination Certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, notified body No. 0044 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. 14 203 142076.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 60079-0:2012 EN 60079-11:2012

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

II (2) G [Ex ib Gb] IIB

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body

Karl-Heinz Schwedt

Hanover office, Am TÜV 1, 30519 Hanover, Fon +49 (0)511 986 1455, Fax +49 (0)511 986 1590

(13) **S C H E D U L E**

(14) **EC-Type-Examination Certificate No. TÜV 14 ATEX 142076**

(15) Description of equipment

The Ex-Separator-Module type iXT0-xxx is used for supply of sensors and for communication of sensors with measuring transmitters.

The following executions of the Ex-Separator-Module type iXT0-xxx are available:

- iXT0-420: Ex-Separator-Module for connection to 4 x RS485 and 2 x 2 wire sensors
- iXT0-421: Ex-Separator-Module for connection to 4 x RS485 and 2 x 2 wire sensors with 1 x HART function
- iXT0-210: Ex-Separator-Module for connection to 2 x RS485 and 1 x 2 wire sensors
- iXT0-211: Ex-Separator-Module for connection to 2 x RS485 and 1 x 2 wire sensors with 1 x HART function

The permissible ambient temperature range is -20 °C ... +40 °C.

Electrical data

Supply circuit ..... (Terminals X2, 4 [+], X2, 3 [GND]; X2, 5 [shield connection], X2, 6 [PE])	U_n = 12 V d. c. (11...13 V d. c.) U_m = 253 V a. c. P ca. 9 W
RS485 circuit ..... (Terminals X2, 1 [RxTx+], X2, 2 [RxTx-])	U_n = 5 V d. c. U_m = 253 V a. c.
2 wire analogous sensor circuit ..... (Terminals X4, 6/7 [optional with HART]; X6, 6/7)	in type of protection Intrinsic Safety Ex ib IIB Maximum values per circuit: U_o = 25.4 V I_o = 89.2 mA P_o = 567 mW characteristic line: linear

max. permissible external inductance	10 mH	1 mH	0.5 mH	0.1 mH
max. permissible external capacitance	370 nF	420 nF	510 nF	810 nF

Sensor communication interface
RS485 ..... in type of protection Intrinsic Safety Ex ib IIB
(Terminals
X3, 1/2; X4, 1/2; X5, 1/2; X6, 1/2)

maximum values per circuit:
U_o = 4.1 V
I_o = 105 mA
P_o = 108 mW
characteristic line: linear
The effective internal inductance and capacitance are negligibly small.

max. permissible external inductance	10 mH	2 mH	1 mH	0.5 mH
max. permissible external capacitance	14 µF	24 µF	29 µF	36 µF

At connection of the sensor communication interface RS485 interface to active intrinsically safe circuits, the rules for the interconnection of intrinsically safe circuits have to be observed.
Permissible values for the connected circuit:

U_i = 11 V
I_i = 176 mA
P_i = 482 mW

Sensor supply ..... in type of protection Intrinsic Safety Ex ib IIB
(Terminals X3, 3/4; X4, 3/4; X5, 3/4;
X6, 3/4)

Maximum values per circuit:
U_o = 10.5 V
I_o = 640 mA
P_o = 6.72 W
characteristic line: rectangular

max. permissible external inductance	119 µH	100 µH	50 µH	10 µH
max. permissible external capacitance	4.2 µF	4.9 µF	8 µF	14.8 µF

The specified external reactances L_o and C_o are valid for simultaneous occurrence. Permissible combinations of the external reactances L_o and C_o have to be taken from the tables of the individual, intrinsically safe circuits.

The intrinsically safe circuits are safe galvanically separated from the non-intrinsically safe circuits up to a peak value of the voltage of 375 V.

(16) The test documents are listed in the test report no. 14 203 142076

(17) Special conditions for safe use

None

(18) Essential Health and Safety Requirements

no additional ones

Translation

1. S U P P L E M E N T

to Certificate No.	**TÜV 14 ATEX 142076**
Equipment:	Ex-Separator-Module type iXT0-xxx and type iXT0 xxx
Manufacturer:	NIVUS GmbH
Address:	Im Täle 2 75031 Eppingen
Order number:	8000444554
Date of issue:	2015-09-17

In the future, the Ex-Separator-Module type iXT0-xxx
(type designation with new transformer: iXT0 xxx) may also be manufactured according to the documents listed in the Test Report.

The following changes relevant for the explosion protection were performed:

- New transformer for safe galvanic separation inclusive of input/output circuitries
- Change of optoelectric couplers with component for power limitation
- Additional "low cost" variant of the apparatus
- Change at some further components
- Change at the circuitry for HART data transmission and change of electrical data for the 2 wire analogous sensor circuit:

Electrical data

2 wire analogous sensor circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(Terminals X4, 6/7 [optional with HART]; X6, 6/7)

Maximum values per circuit:
U_o = 25.4 V
$I_{o, stat.}$ = 89.2 mA
$I_{o, dyn.}$ = 273 mA
P_o = 567 mW
characteristic line: linear

max. permissible external inductance	0.51 mH	0.2 mH	0.1 mH	0.05 mH
max. permissible external capacitance	400 nF	580 nF	740 nF	810 nF

All other details remain unchanged.

The equipment incl. of this supplement meets the requirements of these standards:

EN 60079-0:2012 EN 60079-11:2012

(16) The test documents are listed in the test report No. 15 203 156295.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body

Meyer

Hanover office, Am TÜV 1, 30519 Hannover, Tel.: +49 (0) 511 986-1455, Fax: +49 (0) 511 986-1590

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx TUN 14.0014 issue No.:1	Certificate history: Issue No. 1 (2015-9-25) Issue No. 0 (2014-9-25)
Status:	**Current**	
Date of Issue:	**2015-09-25**	Page 1 of 4
Applicant:	**NIVUS GmbH** Im Täle 2 75031 Eppingen **Germany**	
Electrical Apparatus: *Optional accessory:*	**Ex-Separator-Module iXT0-xxx and iXT0 xxx**	
Type of Protection:	**Intrinsic Safety**	
Marking:	[Ex ib Gb] IIB	
Approved for issue on behalf of the IECEx Certification Body:	Andreas Meyer	
Position:	Head of IECEx Certification Body	
Signature: *(for printed version)*		
Date:	2015-09-25	

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1
30519 Hannover
Germany

IECEx Certificate of Conformity

Certificate No.: IECEx TUN 14.0014

Date of Issue: **2015-09-25** Issue No.: **1**

Manufacturer: **NIVUS GmbH**
Im Täle 2
75031 Eppingen
Germany

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
DE/TUN/ExTR14.0027/01

Quality Assessment Report:

DE/TUN/QAR13.0011/02

IECEx Certificate of Conformity

Certificate No.: IECEx TUN 14.0014

Date of Issue: **2015-09-25** Issue No.: **1**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

See annexe

CONDITIONS OF CERTIFICATION: NO

IECEx Certificate of Conformity

Certificate No.: IECEx TUN 14.0014

Date of Issue: **2015-09-25** Issue No.: **1**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

See annex

Annex: _Annexe__issue 1 COC_iXT0xxx_TUN14.0014.pdf

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:	**“Ex“ intelligentes "Ex" Trennmodul iXT0**
Description:	*“Ex” intelligent "Ex" Seperation Interface iXT0*
Désignation:	*“Ex”modul isolateur intelligent, type iXT0*
Typ / Type:	**iXT0-xxx / iXT0xxx**

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
- 2014/34/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug 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 61326-1:2013
- EN 60079-0:2012 +A11:2013
- 60079-11:2012

Ex-Kennzeichnung */ Ex-designation / Marquage Ex* : Ⓔx II (2) G [Ex ib Gb] IIB

EG-Baumusterprüfbescheinigung / *EC-Type Examination Certificate / Attestation d'examen «CE» de type:*

TÜV 14 ATEX 142076 (1. Ergänzung)

Notifizierte Stelle (Kennnummer) / *Notified Body (Identif. No.) / Organisme notifié (№ d’identification)*

TÜV Nord CERT GmbH, Am TÜV 1, 30519 Hannover, Allemagne (0044)

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
Allemagne

abgegeben durch / *represented by / faite par:*
Marcus Fischer (Geschäftsführer / *Managing Director / Directeur général)*

Eppingen, den 26.07.2017

Gez. *Marcus Fischer*