BARTEC

# Product area 3003

## Instruction manual

**FFB 3003**

# Legal provisions

The information contained in this manual is the property of BARTEC GmbH.

The publication, in whole or in part, requires written consent.

Internal duplication intended to evaluate the product or for proper use is permitted and does not require approval.

# Additional information

The product was developed, produced and tested with great care, using the latest technology.

BARTEC GmbH meets the requirements of DIN EN ISO 9001 which is proven by its certified quality management system.

Please refer to the latest version of this manual on the customer portal.

Read the manual carefully before operating the product.

Visual representations in this manual may differ from the actual design of the product.

If you have any questions, we are happy to help.

For more information about the product and BARTEC GmbH, please refer to our company website.

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## Bedienungsanleitung

## FFB 3003

SA 090406
Effective: 19.01.2024
Operator: BR

# Contents

# 1 Notes on this manual

Please read the manual carefully before commissioning the product.

The following manual describes the installation, commissioning and operation of the product. Keep this document accessible at all times and for the entire service life of the product.

Please pay particular attention to the safety and warning instructions.

The illustrations in this manual are for illustrative purposes only and may differ from the actual design of the product.

Our software solutions are continually being improved and developed. If you use a different software version or a different system configuration, the screen displays on your product may differ from the display illustrations in the manual.

If you require further information, please do not hesitate to contact our sales and service team.

## 1.1 Scope of application

This document applies to the following product: FFB 3003.

BARTEC GmbH reserves the right to make technical changes.

## 1.2 Target group

The manual contains the information required for the intended use of the product.

It has been drawn up for technically qualified personnel.

Knowledge and technically correct implementation of the safety instructions and warnings described in this manual are a prerequisite for safe installation and commissioning.

## 1.3 Requirements of operating personnel

The following skills are required of persons appointed to operate the unit:

- They must be physically and mentally fit.
- They must be in good health.
- They must be trained in how to operate the machine.
- They must have demonstrated their aptitude for the job to the operator.
- They must be reliable and capable of carrying out the duties assigned to them.
- The operator must clearly define the scope of responsibility and skills required of the personnel appointed to use the unit.
- Those who are being trained to use the unit may work on the unit only under the constant supervision of an experienced person.
- Before deploying the personnel, we recommend conducting a health and safety briefing session and keeping records with signatures confirming attendance

## 1.4 Safety instructions

Warnings are used in this manual in order to help prevent personal injury and damage to property. Always read and observe these warnings

The following types of safety instructions are used in this manual:

| WARNING! | |
|---|---|
|  | The signal word **WARNING** indicates a hazard with a medium degree of risk.<br>Failure to observe the safety measures may result in moderate injuries without permanent damage. |

The signal word **ATTENTION** indicates a hazard with a low degree of risk.

Failure to observe the safety measures may result in minor or moderate injury.

## 1.5 Symbols and visualisation aids

The following pictograms and symbols in this manual are used to highlight places in the text that require particular attention.

**NOTE**

Important notes and information for effective, efficient and environmentally friendly use of the product.

**Explosive application**

This symbol indicates special instructions for explosive applications.

**SUBJECT TO LICENCE**

This symbol indicates functions that are available only if a corresponding option requiring a licence has been activated.

## 1.6 Languages

The original manual was written in German.

All other languages available are translations of the original manual. The German language version is authoritative.

If further languages are required, these must be requested from BARTEC GmbH or specified when placing an order.

# 2 Safety

Please read this manual before installing and commissioning the product in order to prevent possible injury and/or damage to property. All users must always comply with the safety and warning instructions.

The safety and warning instructions must be read and observed by all users of the product.

If the product is sold, rented and/or otherwise passed on, please also include this manual.

## 2.1 Intended use

The product has been manufactured in compliance with the applicable regulations and has left the factory in perfect condition.

The operator of the product is responsible for complying with all regulations applicable to storage, transport and handling.

| WARNING! | |
|---|---|
|  | **Danger to life resulting from unauthorised modifications to the product**<br>Unauthorised modifications to the product can lead to serious safety problems and danger to life and limb.<br>► Unauthorised modifications of any kind to the product are not permitted. |

**Expiration of the manufacturer's warranty resulting from unauthorised modification of the product**

If unauthorised modifications are made to the product, the manufacturer's warranty shall become void.

## 2.2 Improper use

Any use other than that described under intended use is not in accordance with the intended use and is therefore not permitted. BARTEC GmbH shall accept no liability for damage caused by improper use. The risks of improper use lie solely with the user.

Improper use of the product includes:

- ► The electrical connection and opening of the unit by unqualified individuals
- ► Faultless and safe operation of the product requires correct and professional transport, storage, assembly and installation as well as careful operation and maintenance of the product.
- ► Failure to observe the manual

| WARNING! | |
|---|---|
|  | Personal injury or damage to property resulting from failure to observe this manual<br>► The product is intended only for the purpose described in this manual.<br>► All installations must be carried out as described in this manual.<br>► Use the product only according to the instructions in this manual. Any other use may result in personal injury and damage to property.<br>► The manual belonging to this device is part of the product and must be available to qualified personnel at all times.<br>► Please read and follow the manual. |

## 2.3 Consequences of failing to observe this manual

Any use of the product other than that described in this manual shall be considered improper. BARTEC GmbH shall accept no liability for damage resulting from failure to observe this manual or the safety and warning instructions contained therein.

## 2.4 Safety instructions

### 2.4.1 General information

Please contact our service staff immediately if

- you notice damage to the product or safe operation is not guaranteed for other reasons. **Do not put the product into operation!**
- you find faults or defects during operation or have doubts about whether the product is working correctly. **Switch off the product immediately!**
- The user is obliged to take all necessary precautions before using the product.
- The product does **not** replace the safety equipment of the vehicle or the customer.

### 2.4.2 Safety instructions for operation

**Commissioning**

- Before commissioning, check that all components and documentation are available.
- Installation must be carried out by qualified personnel.
- Make sure that the data and operating conditions specified by BARTEC BENKE are complied with.
- Before connecting the mains power supply, make sure that the mains voltage is compatible with the operating voltage of the equipment.

**Operation**

- Operation may be carried out only by trained and qualified personnel.

**Inspection**

- In accordance with EN/IEC 60079-17, the operator of electrical systems in potentially explosive atmospheres is obliged to have them checked for proper condition by a qualified electrician.

**Maintenance**

- For electrical installations, the relevant installation and operating regulations must be observed (e.g. Directive 99/92/EC, Directive 2014/34/EU, BetrSichV [Ordinance on Industrial Safety and Health] or the nationally applicable regulations EN/IEC 60079-14 and the DIN VDE 0100 series).
- When disposing of the product, you must observe national waste disposal regulations.

**Servicing**

- Follow the instructions on operating and servicing of the product.
- Servicing may be carried out only by trained and qualified personnel.

**Repairs**

- Repairs may be carried out only by authorised persons using original spare parts and in accordance with the state of the art. The provisions applicable to this must be complied with.

## 2.5 Warranty

| WARNING! | |
|---|---|
|  | **Unauthorised modifications and/or alterations to the product.**<br>► The explosion protection as well as design and production according to stress and safety requirements are no longer guaranteed. |

- ► Contact the manufacturer and obtain written permission before making any changes or modifications.
- ► Use only original and spare wear parts.

**Assumption of guarantee**

The manufacturer assumes the complete guarantee only and exclusively for spare parts ordered from them.

Our “Terms and conditions of sale and delivery” shall apply as a general principle.

These shall be made available to the operator upon concluding the contract at the latest.

Warranty and liability claims for personal injury and damage to property are excluded if they can be attributed to one or more of the following causes:

- ► Improper use of the product.
- ► Incorrect assembly, commissioning, operation and servicing of the product.
- ► Failure to follow the instructions in the manual regarding transport, storage, assembly, commissioning, operation and servicing.
- ► Unauthorised structural modifications to the product.
- ► Inadequate monitoring and inspection of parts subject to wear.
- ► Incorrectly executed repairs.
- ► Damage caused by foreign bodies and force majeure.

We grant a warranty period of one year on the product and its accessories from the date of delivery from the Gotteszell factory. This warranty covers all parts of the delivery and is limited to the free replacement or repair of defective parts at our factory in Gotteszell. For this purpose, delivered packaging should be kept if possible. If necessary, the goods are to be sent to us after written agreement. There is no requirement for rectification at the place of installation.

## 2.6 Obligation of the operator

Only individuals who:

- ► - are familiar with the basic regulations on safety and accident prevention and have been instructed in their use
- ► - have read and understood the documentation, the safety chapter and the warnings
  may work on the product
- ► The operator shall ensure that the safety and accident prevention regulations applicable in each individual case are complied with.

## 2.7 Standards and regulations

| Standard | Designation |
|---|---|
| | |
| | |
| | |
| | |
| | |

## 2.8 Inspection certificates

For products intended for operation in potentially explosive atmospheres, the following section describes the marking and types of protection.

Depending on the required approval, the product is marked according to:

- ► ATEX
- ► IECEx
- ► CSA
- ► UL
- ► CRN

Further approvals are available upon request.

## 2.9 Handling/prevention of damage to property

### 2.9.1 Correct connection

Incorrect connection of the supply will destroy the fittings and components and invalidate the warranty.

### 2.9.2 Storage at too high a temperature

Store the product at the intended storage temperature as the electronics or seal may otherwise be damaged.

When storing at higher temperatures, ensure sufficient air conditioning.

### 2.9.3 Aggressive cleaning agents

When choosing the right cleaning agent, pay attention to its suitability as seals and connections may otherwise be damaged.

Flammable products are generally not permitted to be used.

### 2.9.4 Water law provisions

According to the VdTÜV certificate TÜ.AGG and VdTÜV_Merkblatt, the following safety devices are provided for the fulfilment of water legislation provisions of the Water Resources Law (WHG) and compliance with immission protection (20. BlmSchV) in Germany:

- Filling safety device to prevent overfilling
- Filling hose safety device to prevent the escape of liquids
- Vapour recovery monitoring system
- Attention button and emergency stop actuation

### 2.9.5 Health hazard resulting from improper disposal

According to the European WEEE Directive, electrical and electronic equipment may not be disposed of with household waste. Their components must be recycled or disposed of separately as toxic and hazardous components can cause lasting damage to health and the environment if disposed of improperly.

As a consumer, you are obliged under the Electrical and Electronic Equipment Act (ElektroG) to return electrical and electronic equipment free of charge at the end of its service life to the manufacturer, the point of sale, or to public collection points established for this purpose. Details are regulated by the respective State law. The symbol on the product, manual and/or packaging indicates this provision. With this type of material separation, recycling, and disposal of old appliances, you are making an important contribution to protecting our environment.

# 3 Transport, disposal, and storage

## 3.1 Scope of delivery

Missing parts or damage must be reported immediately in writing to the carrier, the insurance company, or BARTEC GmbH.

## 3.2 Packaging

Dispose of the packaging materials at designated disposal points. Observe the applicable national regulations when disposing of the product.

## 3.3 Transport

| WARNING! | |
|---|---|
|  | **Risk of death or injury from falling heavy suspended loads**<br>► Never stand or walk under suspended loads.<br>► Secure the product with a suitable fastening device before transport. |

**Avoid hard impacts (e.g. from falling or setting down too hard)**

This may damage the product.

- ► Use only lifting equipment and load lifting devices with sufficient load-bearing capacity.
- ► The permissible lifting weight of a lifting device may not be exceeded.
- ► Set the product down slowly.

For further information, please refer to the ‘Servicing and care’ chapter.

## 3.4 Storage

**Damage resulting from improper storage**

Damage caused by improper storage is not covered by the warranty policy of BARTEC GmbH.

## 3.5 Disposal

Observe the applicable national regulations when disposing of the product.

Dispose of the product at designated disposal points.

Read the manual carefully before operating the product.

The following manual describes the installation, commissioning and operation of the product. Keep this document for the entire service life of the product and make it accessible at all times.

Please pay particular attention to the safety and warning instructions!

The drawings in this manual are for illustrative purposes only and may differ from the actual design of the product.

Our software solutions are continuously improved and developed. Due to a different software version or a different system configuration, the screen displays on your product may differ from the display drawings in the manual.

Should you require further information, please do not hesitate to request it from our sales and service team.

# 4 Servicing and care

Before starting work, familiarise yourself with the general safety instructions

(see ‘Safety’ chapter).

Servicing and care should be carried out only by trained and qualified personnel.

## 4.1 Maintenance work

### 4.1.1 Servicing

Regular servicing is recommended if the unit is operated properly and in accordance with the instructions and ambient conditions.

**Servicing and care**

- For maintenance, servicing and testing of the equipment, the currently valid regulations and the national regulations must be complied with.
- Operating and maintenance work may be carried out only by trained and qualified personnel. Statutory regulations and other binding guidelines on occupational safety, accident prevention, and environmental protection must be observed.

### 4.1.2 Visual inspection

Carry out a visual inspection every month:

- Check the product, cable entries and cables for damage.
- Check screw connections for tightness.
- Check the fault recorder for contents.

### 4.1.3 Cleaning

Do not use solvents to clean the product as they can damage seals.

### 4.1.4 Repairs

Repairs to the product and accessories may be carried out only by trained and qualified specialist or service companies.

### 4.1.5 Faults and error messages

**A change in operating behaviour may be an indication of existing damage.**

Do not put the product back into operation until the cause of the fault has been eliminated.

# 5 Safety precautions

## 5.1 General Safety Regulations

The operator of the system is responsible for compliance with all the regulations that apply to the storage, transportation and transhipment of flammable liquids.

For safe installation and commissioning, the knowledge of the safety in-structions and warnings in this service manual and their strict compliance are essential.

Careful handling and consistent adherence to instructions can help to prevent accidents, injuries and property damage.

Regulations and requirements lose none of their validity when the system is operated using PETRODAT units.

PETRODAT units were manufactured with due consideration to the regu-lations in force and left the factory in perfect condition. The equipment must be installed and maintained by qualified technical personnel.

- Make sure that the data and operating conditions specified by the manufacturer (BARTEC BENKE) are observed.
- Follow the instructions for operating and servicing the units.
- If you discover any signs of damage or destruction to any parts of the system or if safe operation of the equipment cannot be guaranteed for any other reason, do not start up the system or, if already in operation, shut it down immediately.

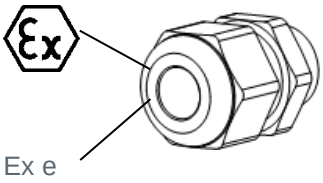
  Notify the local service centre.
- You should also contact our service specialists if you discover any faults or defects during operation or if you have cause to doubt whether the units are working properly.
- The PETRODAT units do not replace the safety facilities of the tanker or the customer (e.g. the overfill safety system).

## 5.2 Installation instructions

- Fit the units so that the specified climatic and temperature values are not exceeded. Protect them, if necessary, by covering, heating or cooling them.
- The installation location should be as free from vibration and shocks as possible. Protect all components from vibration through the use of sturdy mounts.
- The place where the printer is installed must provide continuous protection against dirt and moisture.
- **When carrying out welding work on the vehicle, the power supply cable to the system must be disconnected (disconnect control gear).**
- Protect the units, in particular the printer, against dirt during installation (metal chips, etc.).
- Seal cable glands that are not used with blanking plugs.
- Before installing, remove the fittings to protect the printer during transport.
- All solenoid valves fitted must be interference-suppressed (anti-surge diode).

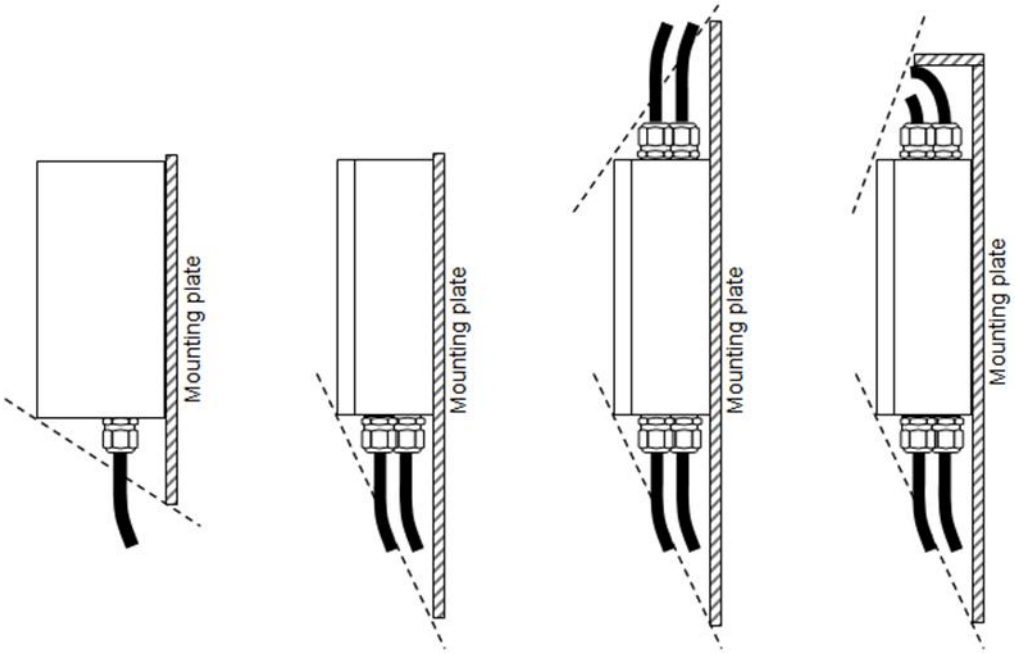
## 5.2.1 Installation explosion protected cable glands "Increased safety" Ex e

Explosion-proof plastic cable glands in type of protection increased safety "Ex e" are suitable for low degree of mechanical hazard.

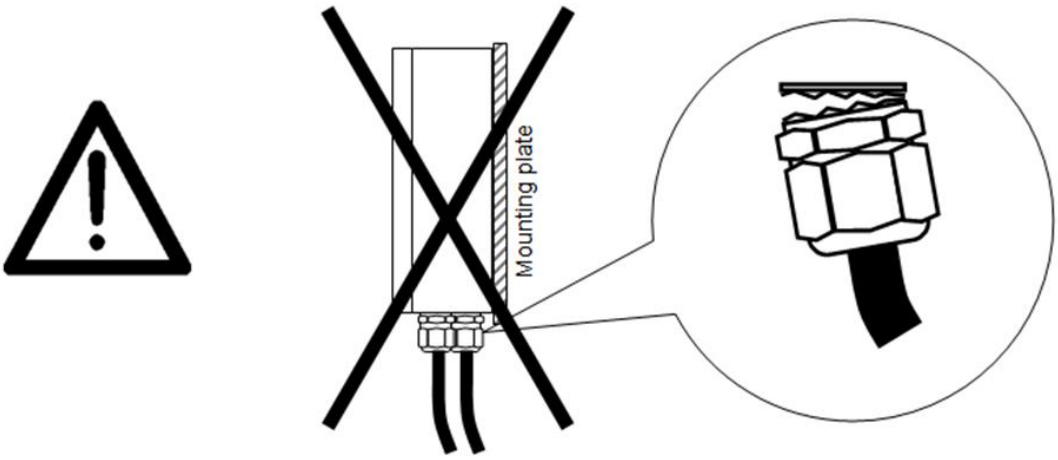



Plastic-cable glands „Ex e IIC Gb“

When installing the equipment, make sure that the cable glands are at no exposed areas and cannot be damaged by moving objects. Therefore, the following installation situations are recommended.




recommended mounting

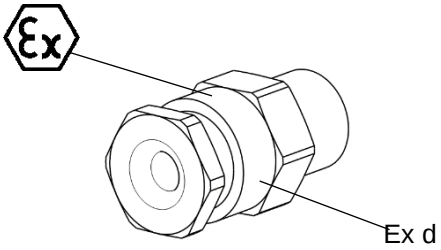



impermissible installation

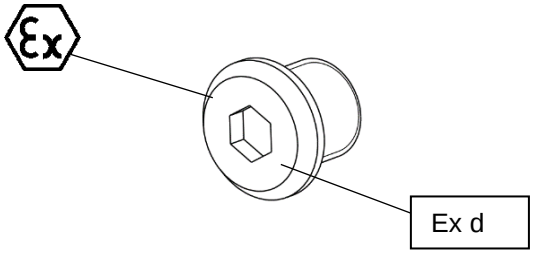
► If a higher degree of mechanical hazard, an additional protection by a cover can be necessary.

## 5.2.2 Installation explosionprotected cable glands "Flameproof enclosure" Ex d

The basic module is designed in type of protection "flameproof enclosure". Therefore, only the cable glands specified in the table below may be used for the base module according to the outer sheath diameter of the cable used. Unused threaded holes must only be closed with the cap specified in the table.

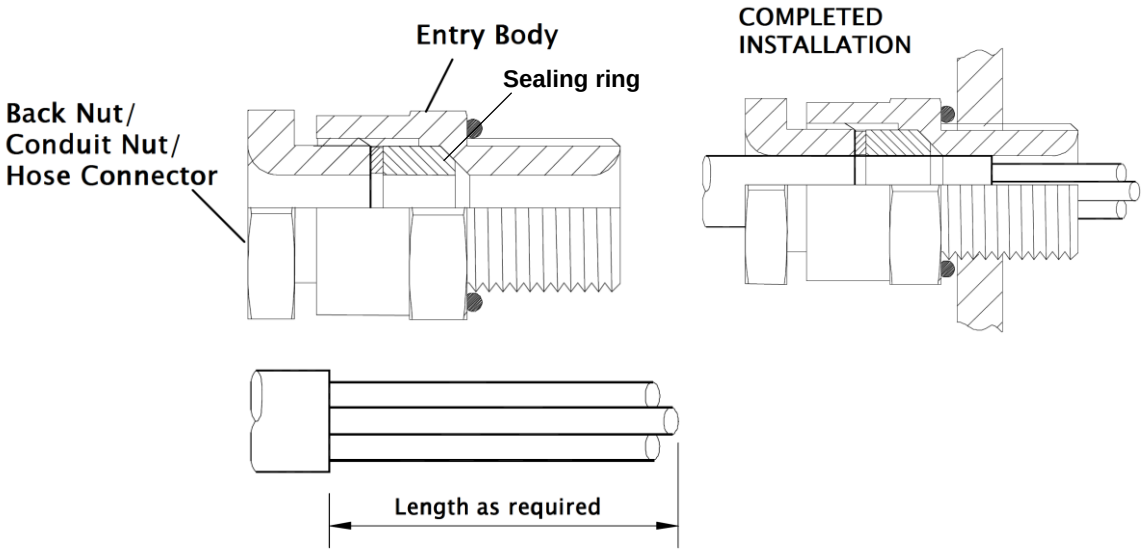



Brass cable gland „Ex d IIC Gb“




Brass shutter „Ex d IIC Gb“

### Mounting of cable glands



## 5.3 Wiring instructions

- ► The wiring must be carried out by trained personnel.
- ► Installation must be in accordance with EN 60079-14 and ADR/GGVS as well as the relevant national regulations.
- ► The service instructions must be followed when wiring the unit.
- ► The connecting cable must be laid so that no individual sections of the cable sag.

  It is appropriate to fasten the cable every approx. 15 - 20 cm using cable clips or cable ties.

  Special care is required when laying the cable near the radiator, in the engine compartment, in the truck chassis members and in the delivery cabin.

  Under no circumstances should areas of weakness be created where the cable may be bent or chafed.
- ► Fit wire end connector sleeves to the ends of cables for terminals.
- ► Tighten unassigned clamping screws.

## 5.4 Information on maintenance and repair

- ► Maintenance and repair must be carried out by trained personnel.
- ► Before carrying out maintenance and repair work, switch off the units and protect them from being switched on again for the duration of the maintenance work.

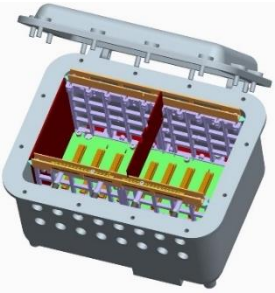
## 5.5 Legend Technical Data

See Technical Data

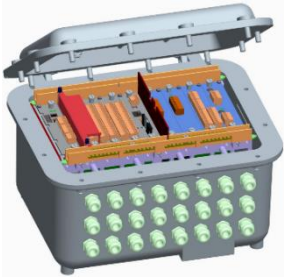
| | |
|---|---|
| Maximum output voltage | Uo |
| Maximum input voltage | Ui |
| Maximum voltage | Um |
| Maximum source voltage | Uq |
| Maximum output current | Io |
| Maximum input current | Ii |
| Maximum stationary input voltage | Is |
| Maximum output power | Po |
| Maximum input power | Pi |
| Maximum external capacitance | Co |
| Maximum internal capacitance | Ci |
| Maximum external inductance | Lo |
| Maximum internal inductance | Li |
| Maximum source resistance | Rq |
| Internal resistance | Ri |
| Switching distance | Sn |
| Supply voltage | Uv |
| Nominal voltage | Un |

# 6 Basic module

## 6.1 Basicmodul Type 6932-10/-11



Basic module 16 type 6932-10



Basic module 24 type 6932-11

### 6.1.1 Technical data

**Electrical data**

| | |
|---|---|
| Auxiliary energy | DC 24 V on-board power supply (depending on power supply plug-in unit) |
| Connection type | plug-in terminals, cable gland |
| Inputs and outputs | see modules |
| Interfaces | see modules |

**Ambient conditions**

| | |
|---|---|
| Operating temperature | - 20 … + 50 °C |
| Storage temperature | - 20 … + 50 °C |
| Equipment group / category / type of protection | II 2 (1) G Ex d [ia IIB Ga] IIA + $C_2H_6O$ T4 |
| Certificates | PTB 12 ATEX 1023 X<br>IECEx PTB 14 0009X |
| Standards | EN 60079-0, EN 60079-1, EN 60079-14<br>IEC 60079-0, IEC 60079-1, IEC 60079-14 |
| Max. allowable power dissipation | 135 W |
| Protection type | IP 65 in accordance with DIN 40050 |

**Device-specific data**

| | |
|---|---|
| Measurement ranges | see modules |
| Precision / resolution | see modules |
| Nominal conditions | 23 °C ± 2 °C |
| Display | external HMI |

**Mechanical data**

| | |
|---|---|
| Dimensions | see dimensional drawing |
| Mounting holes | see dimensional drawing |
| Weight | about 15.8 kg (without modules and without cable glands) |
| Enclosure material | Aluminium cast |

**Order details**

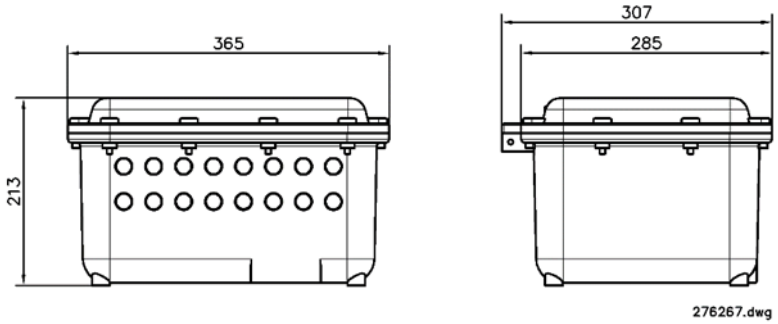
| Designation | Order number |
|---|---|
| Basic module 16, type 6932-10 | 276267 |
| Basic module 24, type 6932-11 | 302531 |

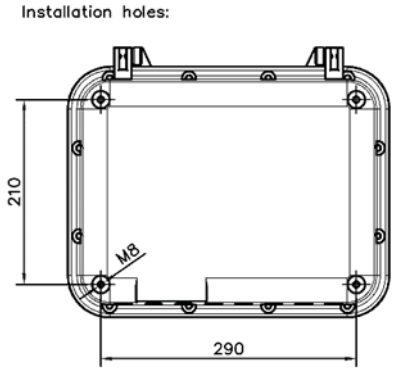
### 6.1.2 Safety instructions

- The joint surfaces must be protected from corrosion with a non-hardening grease (see also EN 60079-14:2003, Para. 10.3)
- For components which are not specified in the examination documents, at least 20% of every cross-sectional area must remain clear. (see EN 60079-1:2004, Appendix D.4.2.7)
- Batteries may only be used in compliance with EN 60079-1:2004, Appendix E.
- Due to the cable glands used with an elastic sealing ring and the housing volume of over 2 $dm^3$, no ignition sources must be present in normal operation (see EN 60079-14:2003, Para. 10.4.2, b and Appendix C.2.1.1 of EN 60079-1:2004)
- Cables and wires must be made of thermoplastic duroplastic or elastomeric materials which to a large extent are firm and circular, have extruded embedding material and whose filler materials, where present, are not hygroscopic (EN 60079-14:2003, Para. 10.4.2)
- Once installed do not dismantle except for routine inspection. An inspection should be conducted as per EN 60079-17. After inspection the gland should be re-assembled as instructed, ensuring the back nut is correctly tightened to ensure the cable is secure.
- If neither earthing nor potential equalisation are required, e.g. for equipment with double or reinforced insulation, the inner and outer connectors for potential equalisation can be dispensed with.
- The control unit Ex d should be connected using suitable cable glands or conduit systems which meet the requirements of EN 60079-1 Sections 13.1 and 13.2 and for which a separate examination certificate exists. When connecting the control unit Ex d using a conduit entry approved for this purpose, the associated capping system must be placed directly on the housing.
- Unused openings must be sealed in compliance with EN 60079-1 Section 11.9.
- The connecting cords of control unit Ex d should be rigid and laid in such a way as to be protected from damage.
- If the temperature at the entry point is more than 70°C, appropriate temperature-resistant connection lines must be used.
- The connection lines of control unit Ex d must be connected in a housing which meets the requirements of a recognised ignition protection type pursuant to EN 60079-0, Section 1 if the connection is performed in an explosive area.
- For the installation and fitting of components (connection boxes, feed-throughs, Ex cable glands, connectors) only ones which technically comply at least with standards EN 60079-0:2006 and EN 60079-1:2004 and for which there is a separate examination certificate are permitted. The conditions of use described in the corresponding component certificates must be strictly followed.
- WARNING! Cable glands of simple construction and sealing plugs of simple construction may not be used.
- WARNING: Do not open when energised!
- Please turn off the main switch during maintenance, not only the system.
- Do not open inside an explosive area!
- Fasten M8 cover screws for housing types 281xx0 and 281xx1 and 281xx2 with 18 Nm
- After opening, replace grease between bottom part and cover!

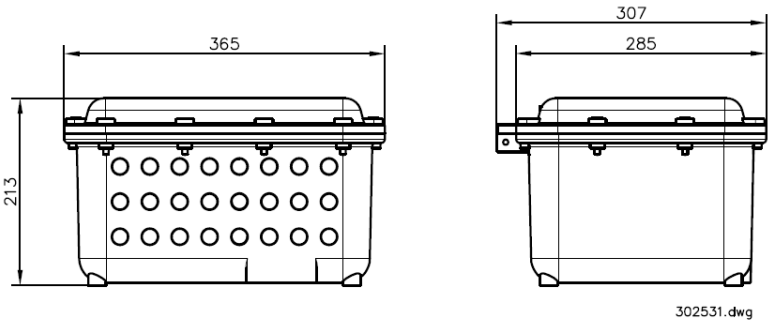
## 6.1.3 Dimensions

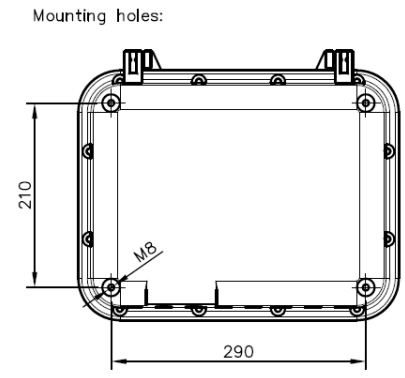
### 6.1.3.1 Basic module 16 type 6932-10



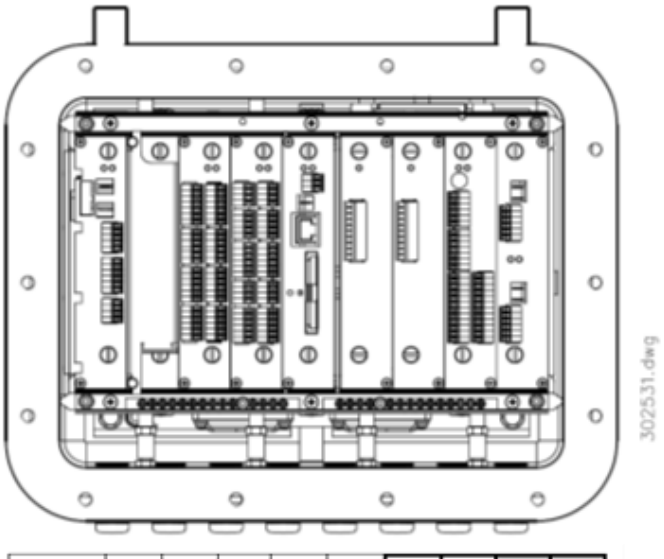




### 6.1.3.2 Basic module 24 type 6932-11



## 6.1.4 Connection plan




*The illustration can deviate from the original.*

| Module slot | | Order No. |
|---|---|---|
| 1xx | 6932-100 (plug-in power supply) | 276746 |
| 2xx | Free (e.g. 6932-101) | |
| 3xx | 6932-101 (I/O-16) | 276268 |
| 4xx | 6932-102 (COMM) | 276269 |
| 5xx | 6932-103 (CPU) | 276292 |
| 6xx | 6932-104<br>(HM Interface for 6922-11) | 276747 |
| 7xx | 6932-104<br>(HM Interface for 6922-10) | 276747 |
| 8xx | 6932-105<br>(3/2K-Interface dual ex i expansion) | 276772 |
| | 6932-113<br>(i-Box Interface 4 - 20 mA) | 344216 |
| 9xx | 6932-105<br>(3/2K-Interface dual ex i) | 276772 |

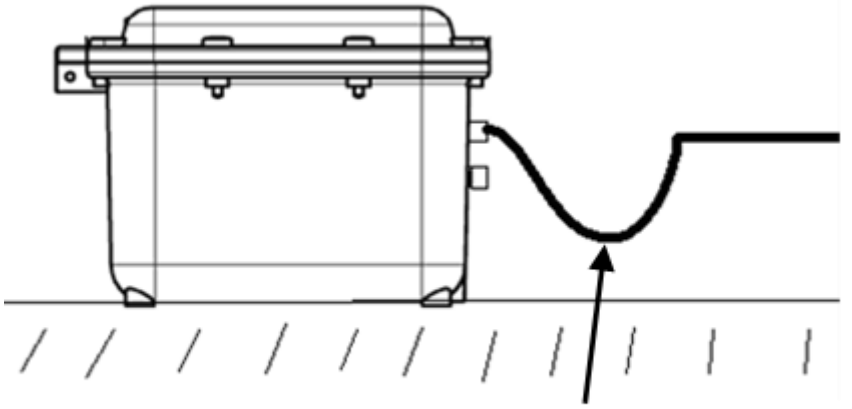
Module slots 6xx, 7xx, 8xx, 9xx only for intrinsically safe plug-in cards.

Module slots 8xx and 9xx are sealed during operation (Accessibility of complete unit).

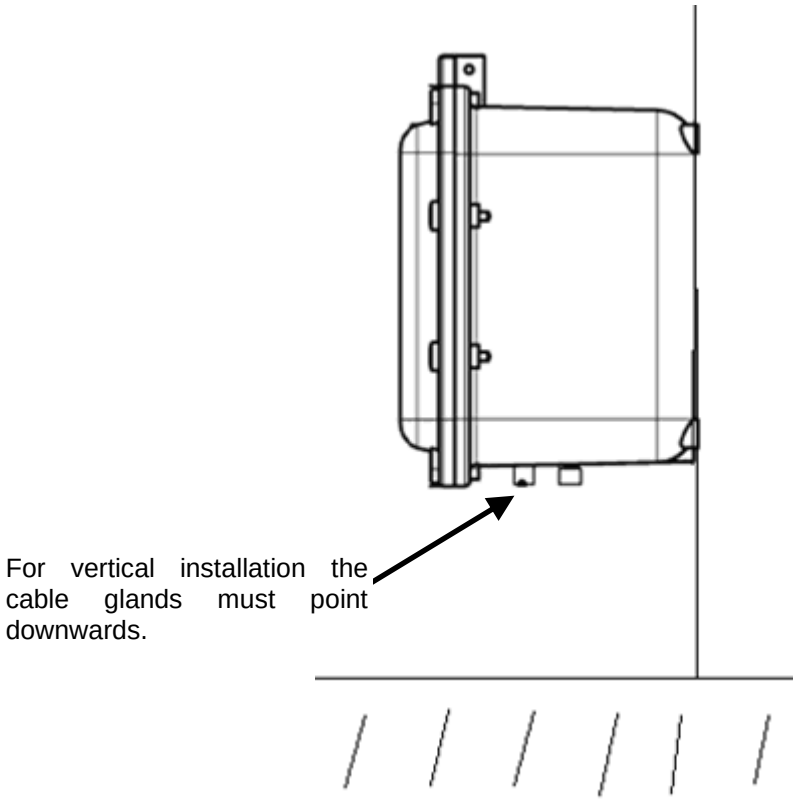
## 6.1.5 Permissible installation positions

For each set-up a shaded position for the basic module is recommended.

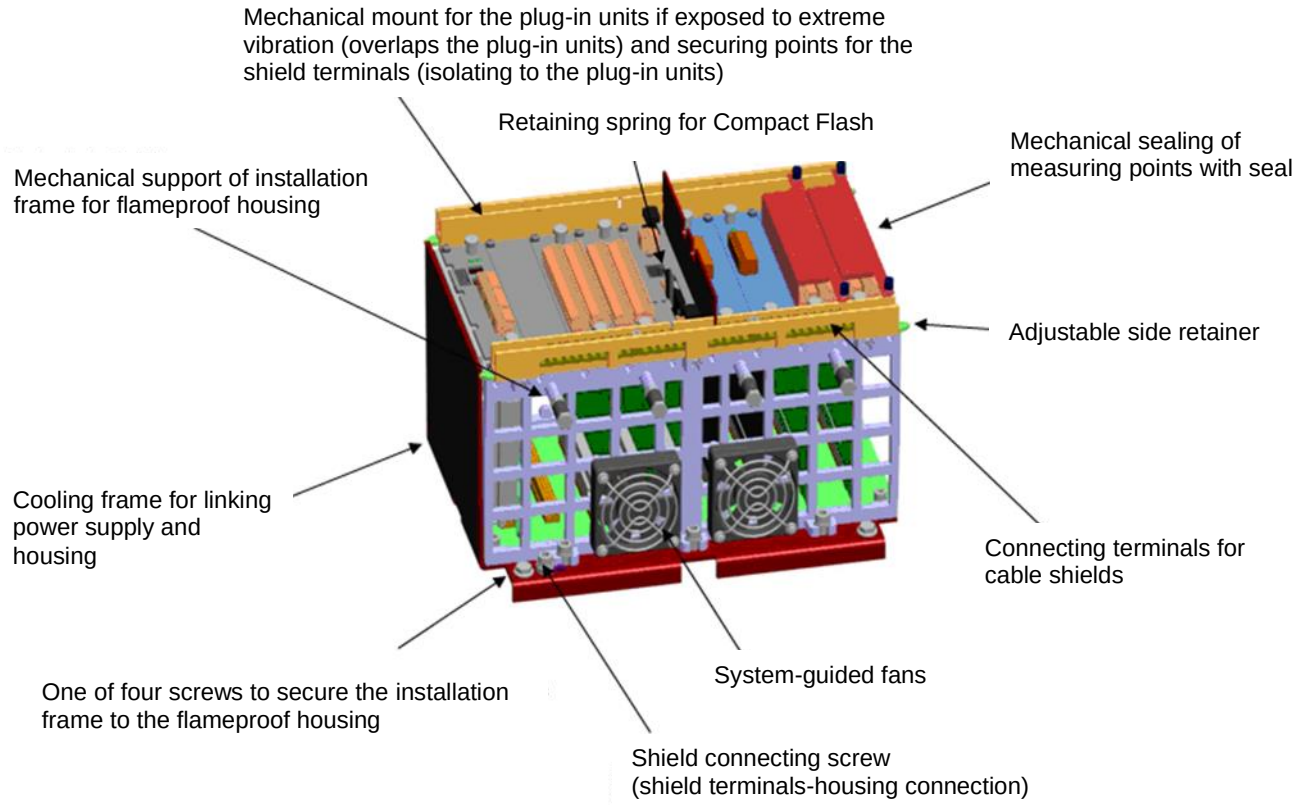
### Horizontal installation



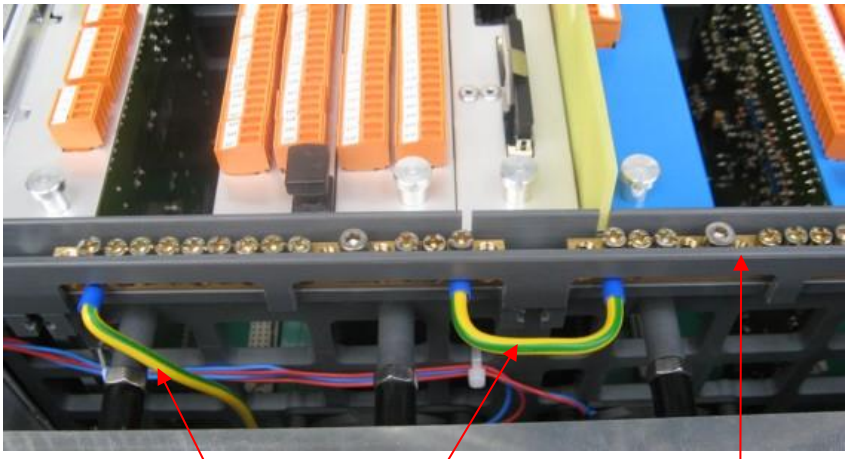

### Vertical installation



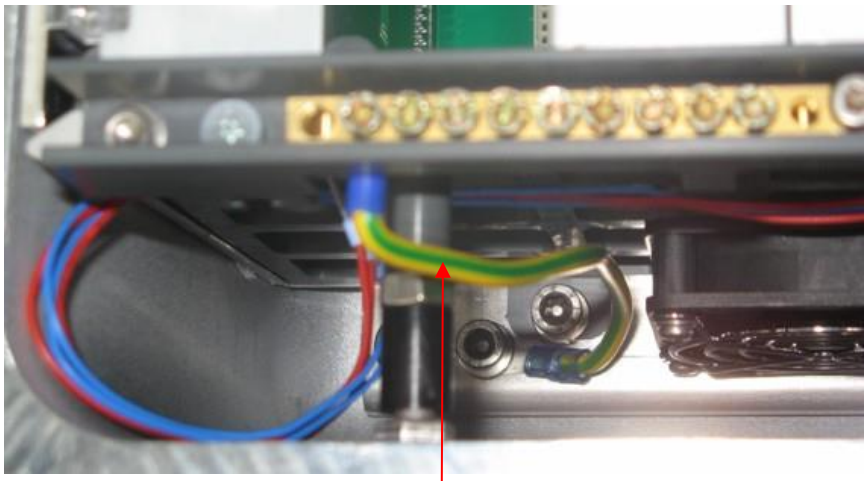
## 6.1.6 Installation frame



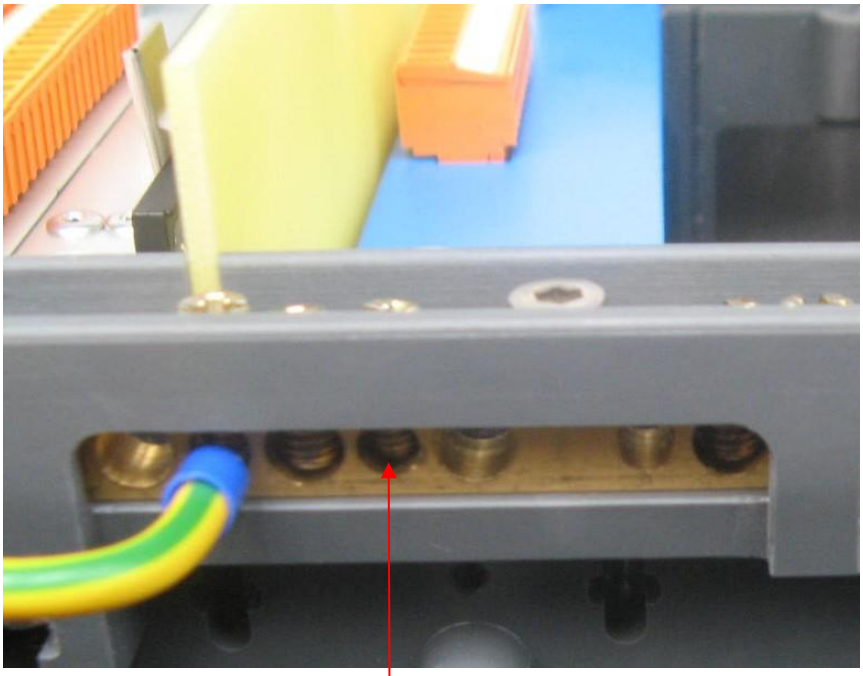

### 6.1.6.1 Retaining rails and shield terminals




| WARNING! | |
|---|---|
| ⚠ | When closing the cover, avoid catching the cables in the cover frames. |

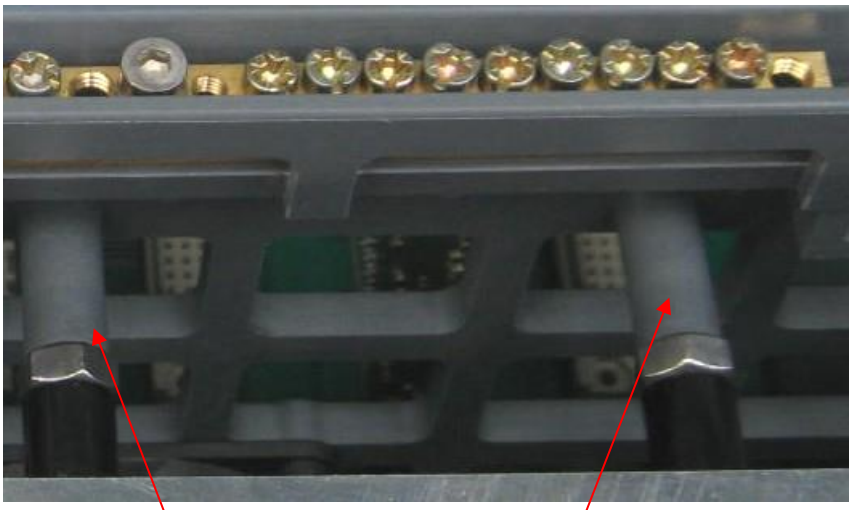


Connecting slots to housing



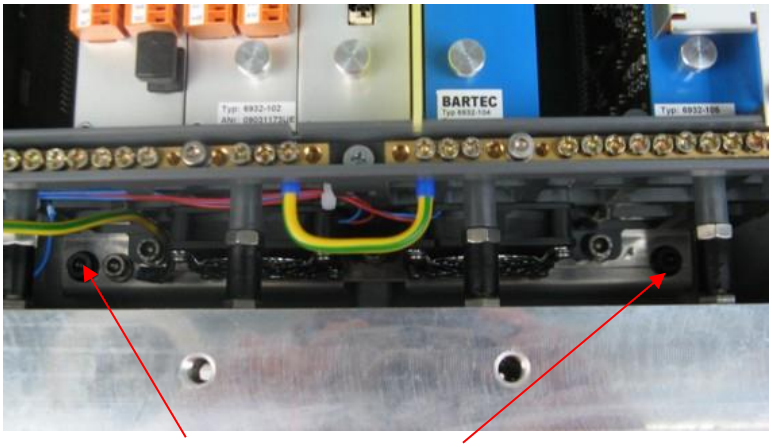
Connection of cable shields

### 6.1.6.2 Spacers

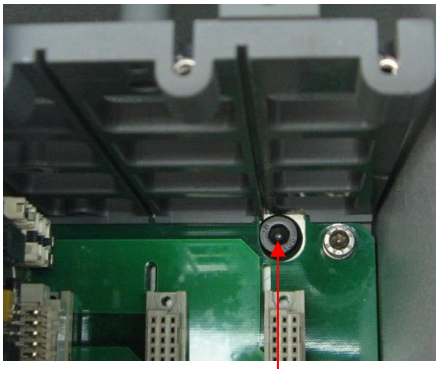


Installation frame spacers to the housing
(must not be loose).

### 6.1.6.3 Mounting screws



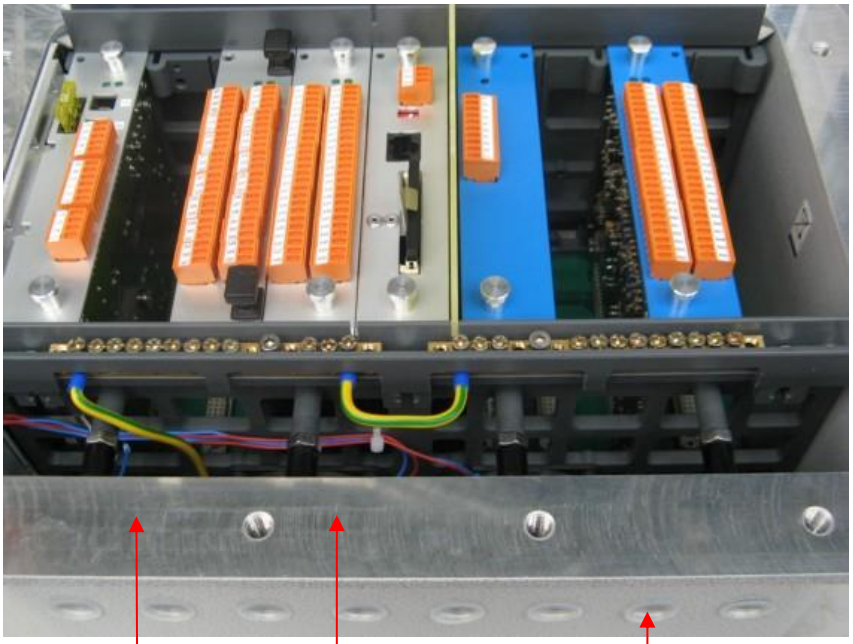

Mounting screws 1 and 2



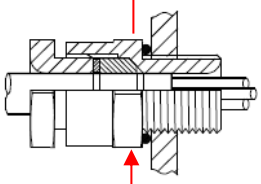
Mounting screw 3
Below module slot 7xx

Mounting screw 4
Below module slot 1xx (the power supply unit must be removed to release it.

## 6.1.7 Sealing



The Ex surface of joint of the flameproof housing must have no scratches or damage and must be coated with the sealing compound provided. (Sealing and corrosion resistance of the Ex surface of joint)



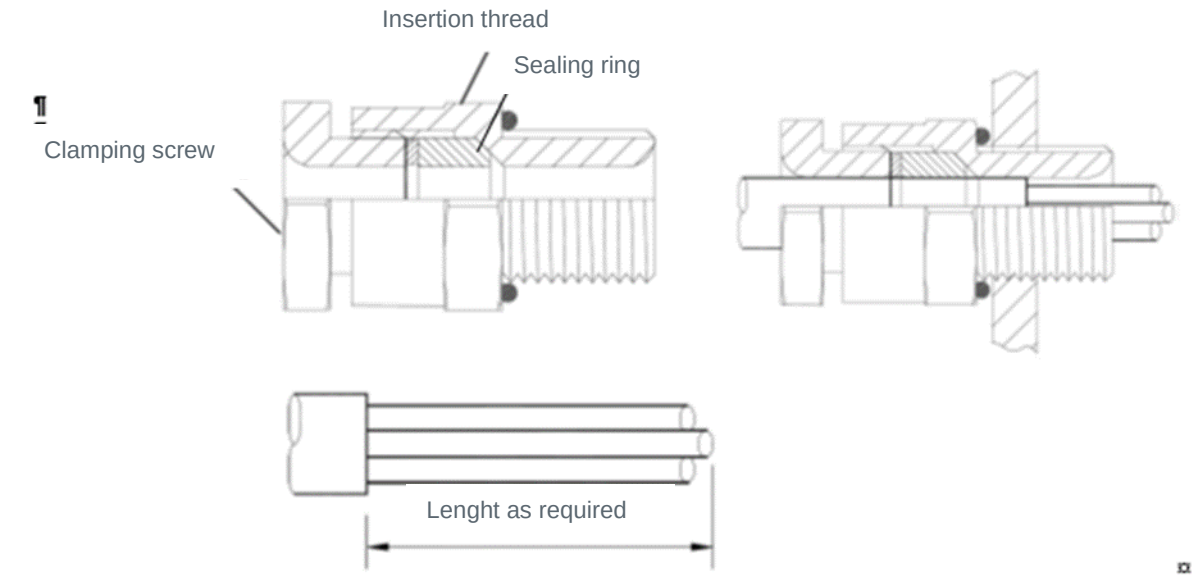
The o-rings on the cable glands must not be damaged

## 6.1.8 Mounting of the cable glands

See chapter 5.2

- Check there is no tension in the threads. It is not necessary to dismantle the gland.
- Fit the complete cable gland to the enclosure. Hand -tighten, then suitably secure with a wrench.
- Prepare cable as required for the installation. If required, fit the shroud over the cable.
- Insert cable through the cable gland. Position the cable correctly. The seal must grip the outer jacket of the cable when the cable gland is tightened.
- Tighten Back Nut/Conduit Nut to the Entry Body. Ensure the seal makes full contact with cable sheath and then tighten the Back Nut/Conduit Nut by the additional turns detailed in the table below. Support the cable to prevent it from twisting during tightening. If fitted, pull shroud over gland assembly.

| Gland Size | Back Nut Turns | Outer Sheath / mm | |
|---|---|---|---|
| | | Min | Max |
| 16 | 2 | 4,0 | 8,4 |
| 20S | 1 | 7,2 | 11,7 |
| 20 | 2 | 9,4 | 14,0 |



# 6.2 Power supply unit 24 V type 6932-100

## 6.2.1 Technical data

### Electrical data

| | |
|---|---|
| Supply voltage | DC 24 V (DC 10 V ... DC 32 V) |
| Output voltage U5.5V | DC 5.5 V ± 1% max. 6 A |
| Output voltage U24V_S | DC 24 V ± 2 % max. 4 A |
| Output voltage ULD | UO = UI -1 V max. 5 A, max. 40 V |
| Output voltage UK | UO = UI -1 V max. 5 A, max. 40 V |

### Ambient conditions

| | |
|---|---|
| Ambient temperature | -20 … +70 °C |
| Ambient temperature (inside the basic module) | -20 … +50 °C |
| Storage temperature | -20 … +50 °C |

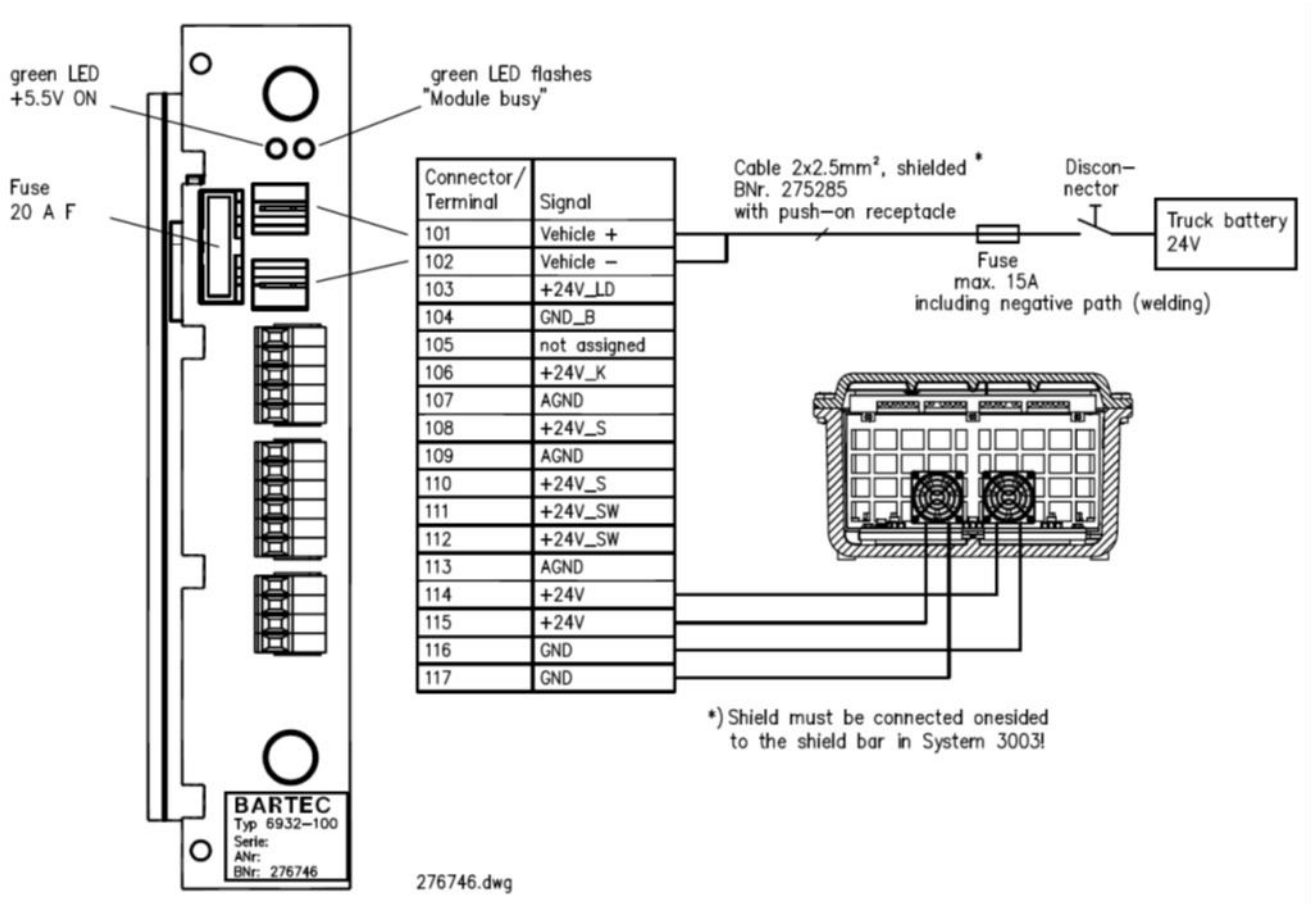
### Mechanical data

| | |
|---|---|
| Weight | Approx. 6.8 N (0.68 kg) |
| Connection | Clamp-type terminal, push-on receptacle 101 - 102 |
| Fuse | 20 A-vehicle-blade terminal fuse (Order No. 215718) |

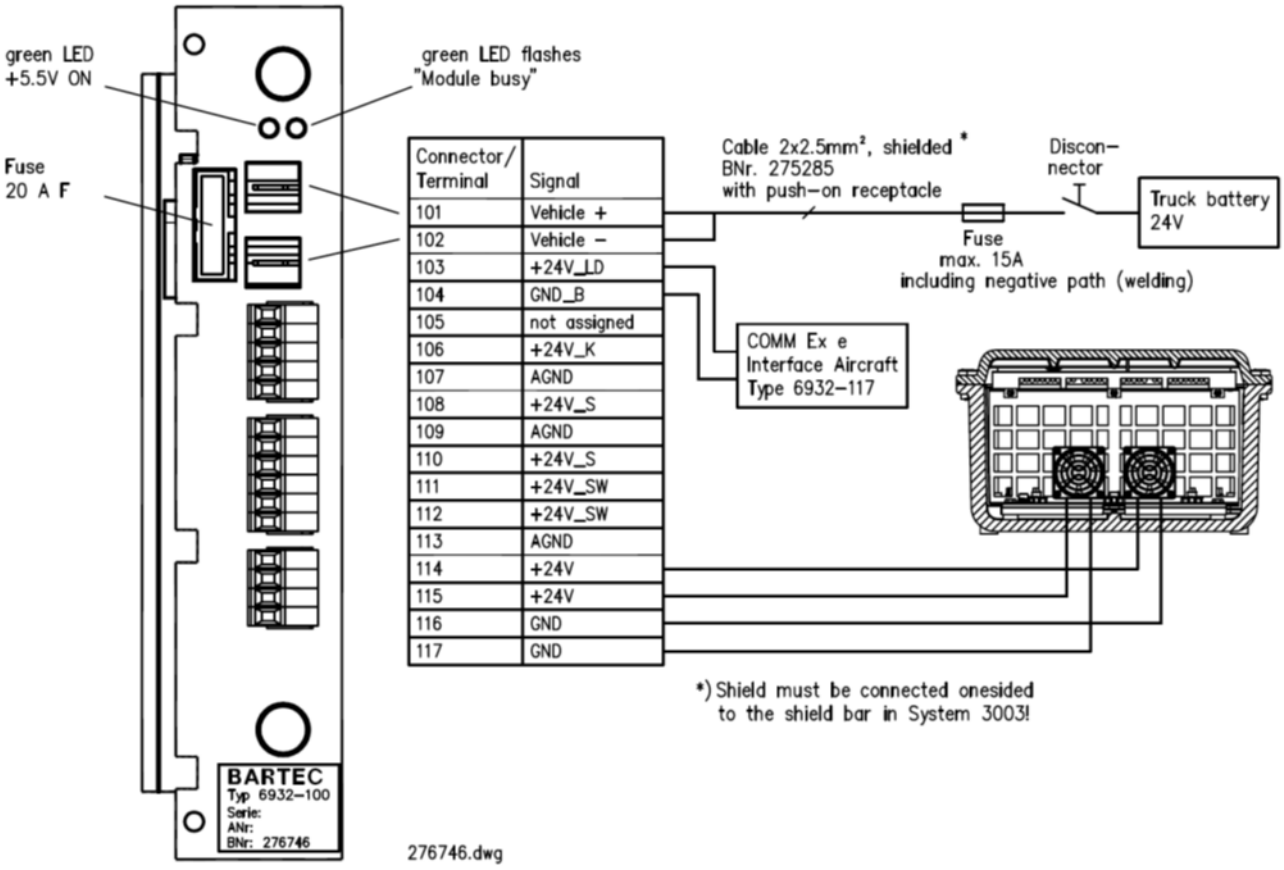
### Order details

| Designation | Order number |
|---|---|
| Power supply unit 24 V type 6932-100 | 276746 |

## 6.2.2 Terminal assignment up to series A



## 6.2.3 Terminal assignment from series B



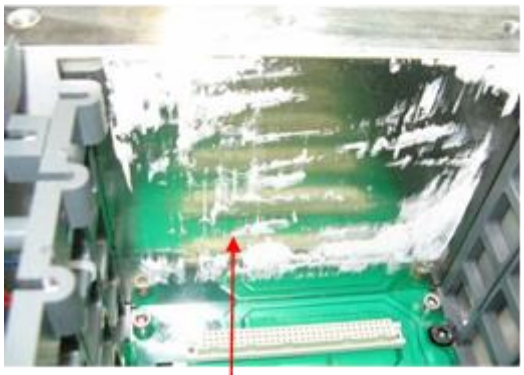

| WARNING! | |
|---|---|
| ⚠ | Fit ferrite (Order No.: 275376) on the outside of the basic module for the power supply cable!<br>When carrying out welding work, the truck power supply to the system must be disconnected (positive and negative path e.g. fuses). |

| Terminals Power supply unit type 6932-100 | Truck supply power | System fan (duplicate) |
|---|---|---|
| 101 (Power supply +) | Battery + (sw1) | |
| 102 (Power supply -) | Battery - (sw2) | |
| 114 (+24V) | | Flex. lead rd rt/red |
| 115 (+24V) | | Flex. lead rd rt/red |
| 116 (GND) | | Flex. lead bl bl /blue |
| 117 (GND) | | Flex. lead bl bl /blue |
| Line-side fuse 20 A, Order no.: 215718<br>Fan default values Switch-on point 70°C, switch-off point 62°C | | |

## 6.2.4 Power Supply Unit

Make sure heat-conducting compound is on power supply heat sink when changing

Mounting screws must not be slack (connection of cooling frame to power supply unit heat sink)



Cooling frame to power supply unit (heat-conducting compound must also be applied to the side towards the housing)

# 6.3 Power supply unit 12 V type 6932-107

## 6.3.1 Technical data

### Electrical data

| | |
|---|---|
| Supply voltage | DC 12 V (DC 7 V ... DC 20 V) |
| Output voltage $U_{5,5V}$ | DC 5.5 V ± 1 % max. 6 A |
| Output voltage $U_{24V\_S}$ | DC 24 V ± 2 % max. 3 A |
| Output voltage $U_{LD}$ | $U_O = U_I$ -1 V max. 5 A, max. 20 V |
| Output voltage $U_K$ | $U_O = U_I$ -1 V max. 5 A, max. 20 V |

### Ambient conditions

| | |
|---|---|
| Ambient temperature | -20 … +70 °C |
| Ambient temperature (inside the basic module) | -20 … +50 °C |
| Storage temperature | -20 … +50 °C |

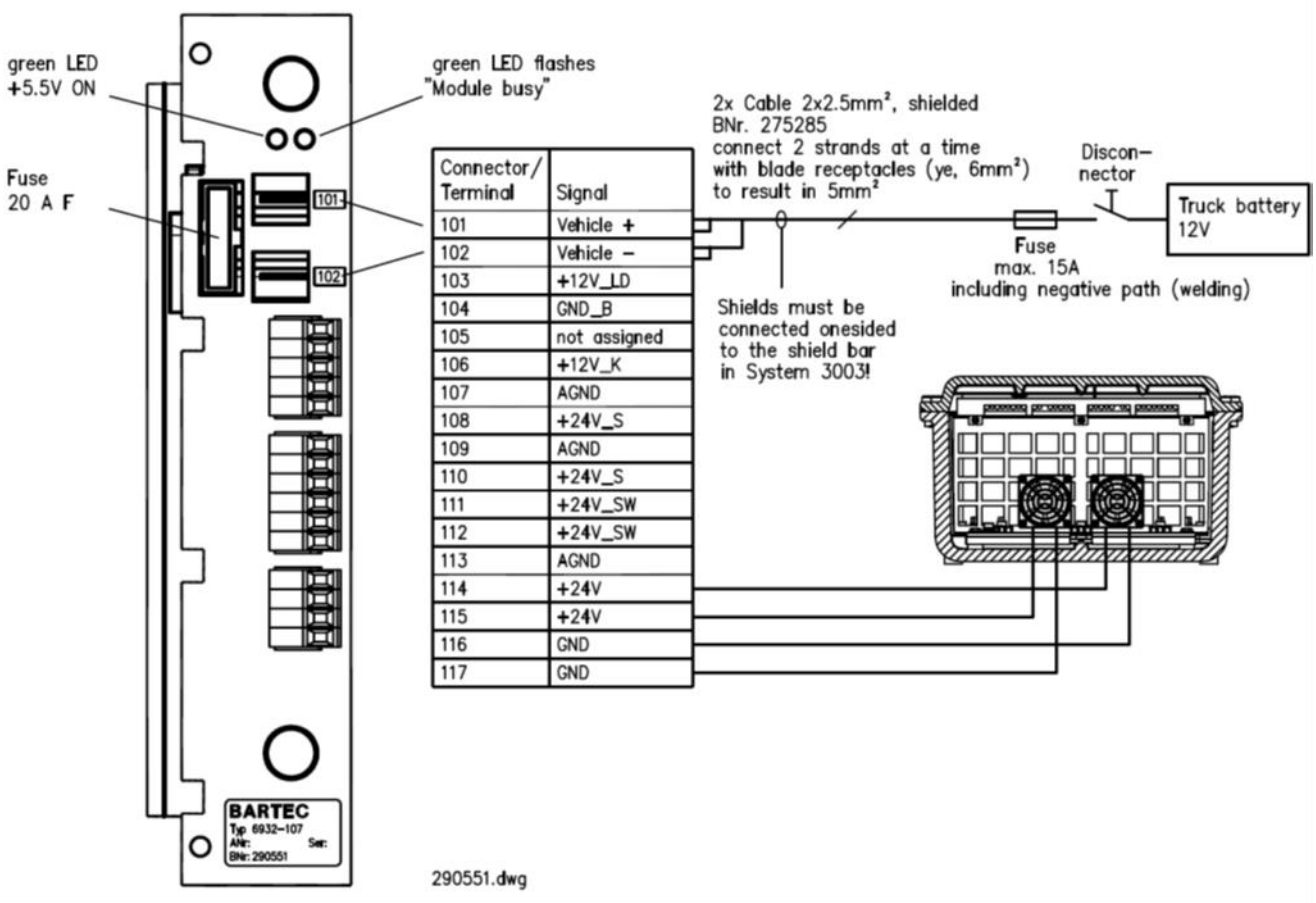
### Mechanical data

| | |
|---|---|
| Weight | Approx. 6.8 N (0,68 kg) |
| Connection | Plug-In clamp, blade receptacle 101 - 118 |

### Order details

| Designation | Order number |
|---|---|
| Power supply 12 V type 6932-107 | 290551 |

## 6.3.2 Terminal assignment




| WARNING! | |
|---|---|
| ⚠ | Fit ferrite (Order No.: 275376) on the outside of the basis module for the power supply cable!<br>When carrying out welding work, the truck power supply to the<br>system must be disconnected (positive and negative path e.g. fuses). |

| Terminals Power supply unit type 6932-100 | Truck supply power | System fan (duplicate) |
|---|---|---|
| 101 (sw1) | Battery + (sw1) + (sw1) | |
| 102 (sw2) | Battery - (sw2) + (sw2) | |
| 114 (+24V) | | Flex. lead rd rt/red |
| 115 (+24V) | | Flex. lead rd rt/red |
| 116 (GND) | | Flex. lead bl bl /blue |
| 117 (GND) | | Flex. lead bl bl /blue |
| Line-side fuse 20 A, Order No.: 215718<br>Fan default values Switch-on point 70°C , switch-off point 62°C | | |

## 6.3.3 Power Supply Unit

Make sure heat-conducting compound is on power supply heat sink when changing

Mounting screws must not be slack (connection of cooling frame to power supply unit heat sink)

Cooling frame to power supply unit (heat-conducting compound must also be applied to the side towards the housing)

## 6.4 I/O-16 Ex e interface type 6932-101

### 6.4.1 Technical data

#### Electrical data

| | |
|---|---|
| Supply voltage electronics | DC 5,5 V, micro fuse 500 mA |
| Supply voltage I/O | Stabilized DC 24 V (from 6932-100 U24 v_S) |
| Fuse | 4 x 6.3 A (four outputs join one fuse) |
| Outputs | |
| Number of channels | 16, galvanic isolated with optocoupler (3750 Vrms) |
| Switch | High side solid state (MOSFET) |
| Voltage | Stabilized DC 24 V (from 6932-100 U24 v_S) |
| Load | 160 mA per output (derating @ 70 °C) |
| RON | Max. 200 mΩ |
| Inputs | |
| Number of channels | 16, galvanic isolated with optocoupler (3750 Vrms) |
| Input impedance | Approx. 3 kΩ |
| Voltage | Stabilized DC 24 V (from 6932-100 U24 v_S) |
| Switch | Bipolar solid state |

#### Ambient conditions

| | |
|---|---|
| Ambient temperature | -20 … +70 °C |
| Ambient temperature (inside the basic module) | -20 … +50 °C |
| Storage temperature | -20 … +50 °C |

#### Mechanical data

| | |
|---|---|
| Weight | 2.0 N (200 g) |
| Connection | Plug terminals |

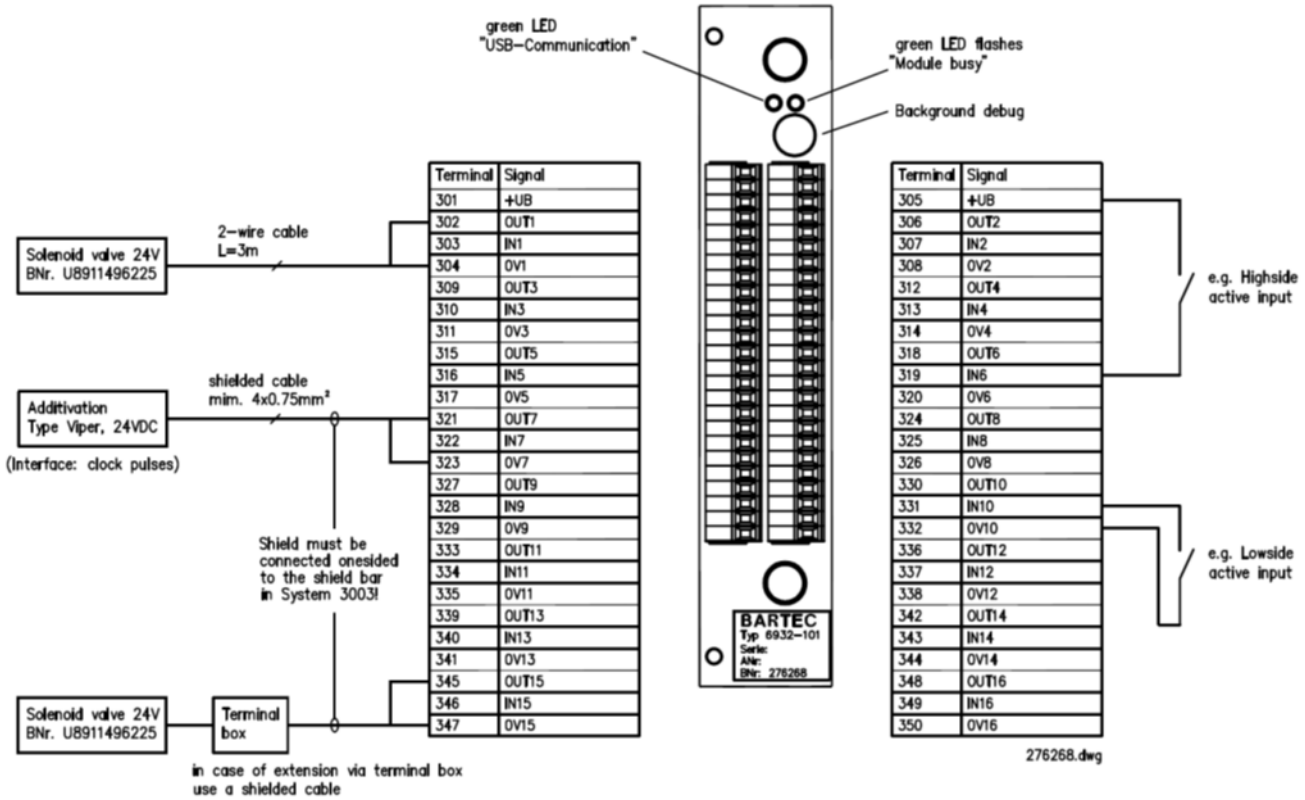
#### Order details

| Designation | Order number |
|---|---|
| I/O-16 Ex e interface type 6932-101 | 276268 |

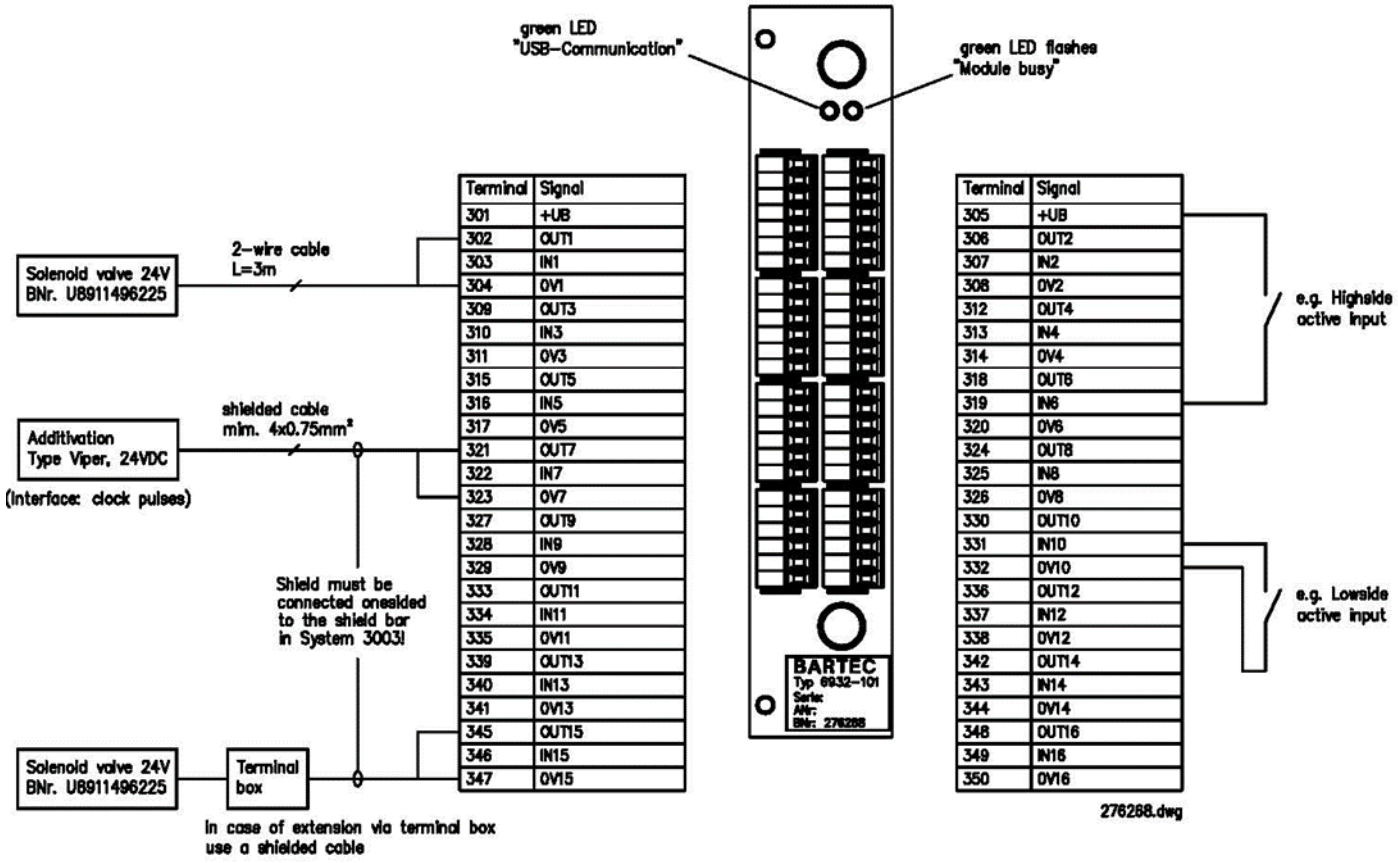
## 6.4.2 Safety instructions

- Alternatively electrically passive, suitable for the respective zone, explosion-proof components can be connected to the inputs and outputs. The electrical data must be considered.
- The inputs can be configured in the low/high side configuration menu.
- When connecting solenoid valves in the hazardous area, the licence of the unit concerned must be taken into account.
- Only pulsed operation is permissible for the Viper addition. If higher ambient temperatures are expected, two outputs must control the addition valve (multifuse/derating). To do this, a switching parameter can be distributed among several outputs in the configuration menu (21 for the addition control).
- The output-voltage is stabilized and EMV-technically locked against the power supply to ensure all control tasks. Therefore, connections to other potentials (e.g. chassis in terms of mass and assignments of reverse voltages plus branches) always have to be galvanically decoupled (e.g. if necessary with additional relay).
- All appliances, such as relays or solenoids must always be connected two-pole.

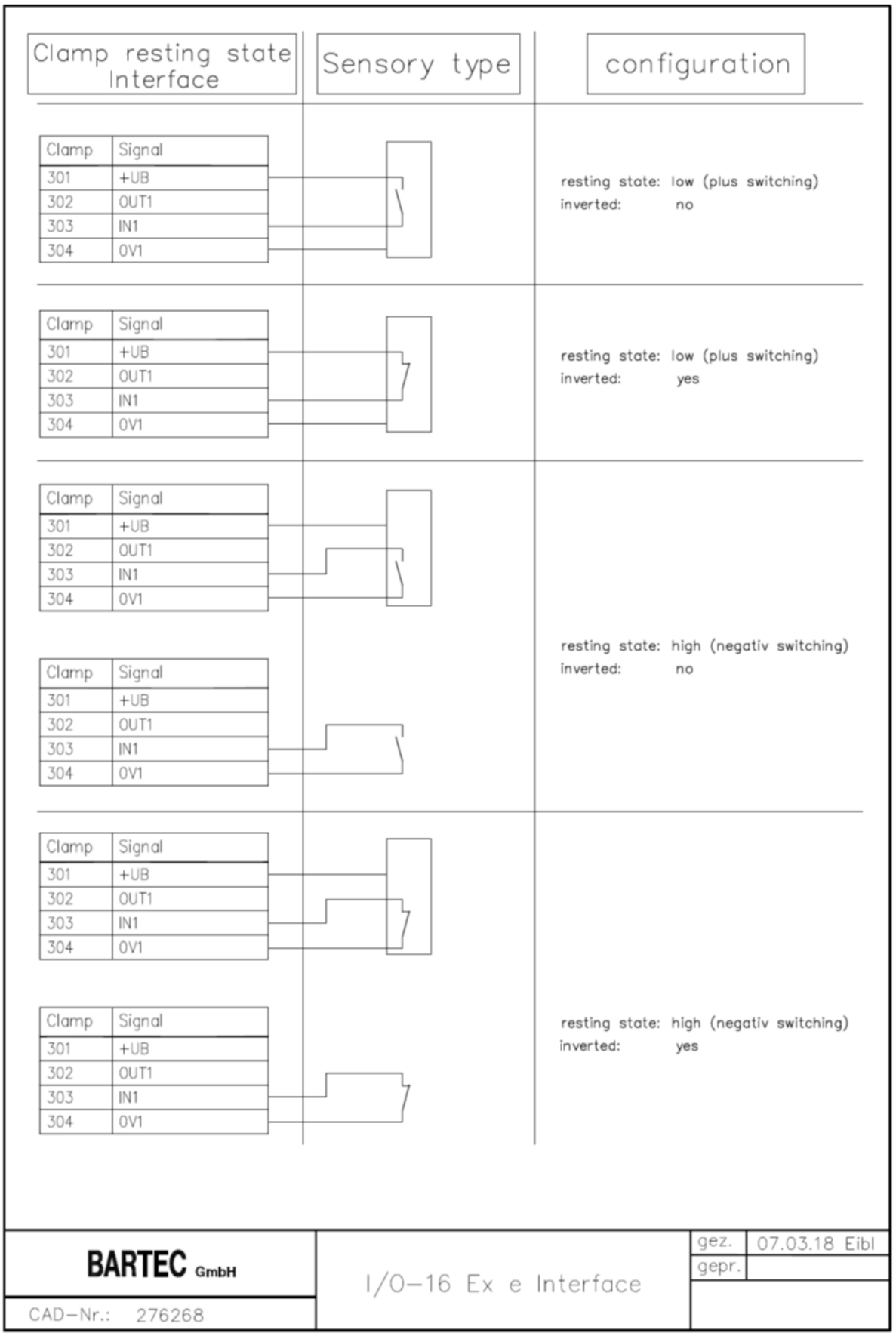
## 6.4.3 Terminal assign. before series A



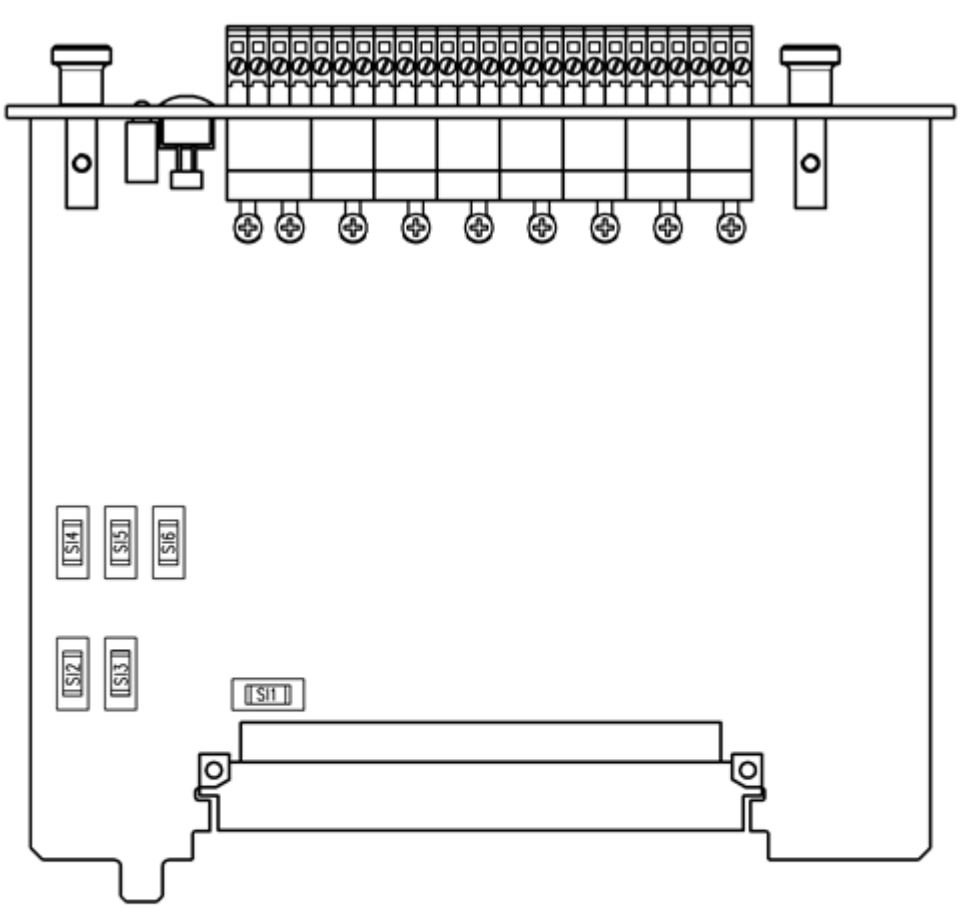
## 6.4.4 Terminal assignment from Series A



## 6.4.5 Possible connection as input



## 6.4.6 Fuse values before Series A

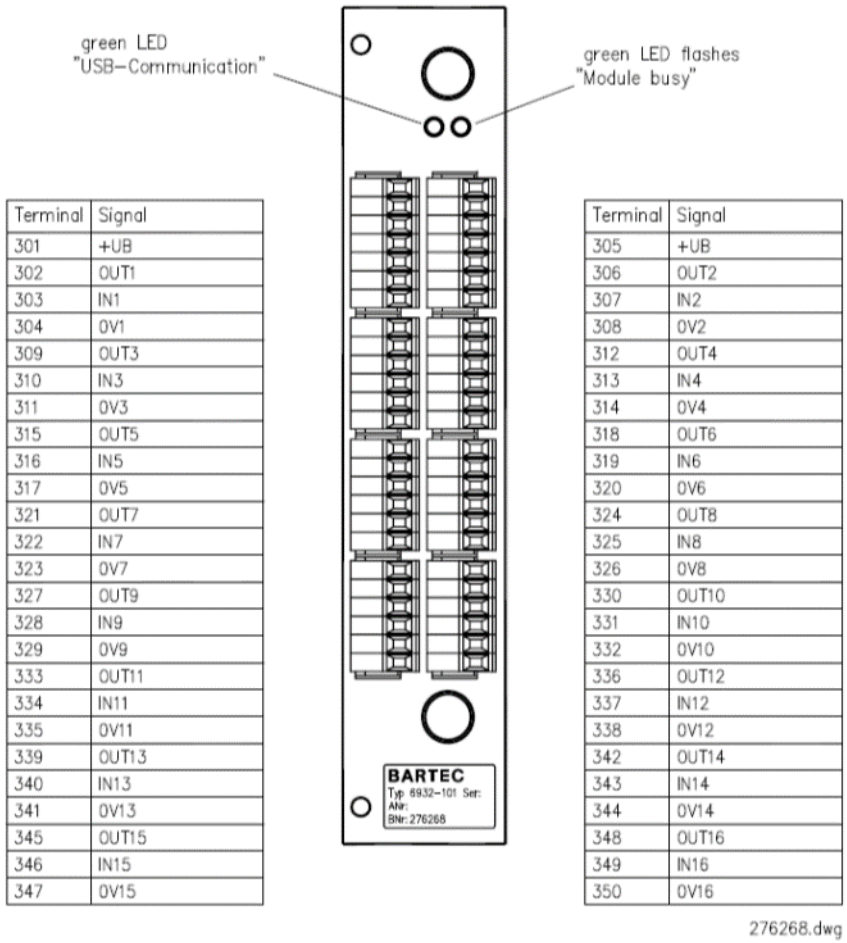



| Fuse | Description | Value | B No. |
|---|---|---|---|
| SI 1 | CPU | F 0.5 A | 235164 |
| SI 2 | Output 1 - 4 | F 6.3 A | 235210 |
| SI 3 | Output 5 - 8 | F 6.3 A | 235210 |
| SI 4 | Output 9 - 12 | F 6.3 A | 235210 |
| SI 5 | Output 13 - 16 | F 6.3 A | 235210 |
| SI 6 | +UB (e.g. inputs) | F 6.3 A | 235210 |

For I/O-16 Interface type 6932-101 the replaceable fuses are omitted from Series A!

## 6.4.7 Wiring examples

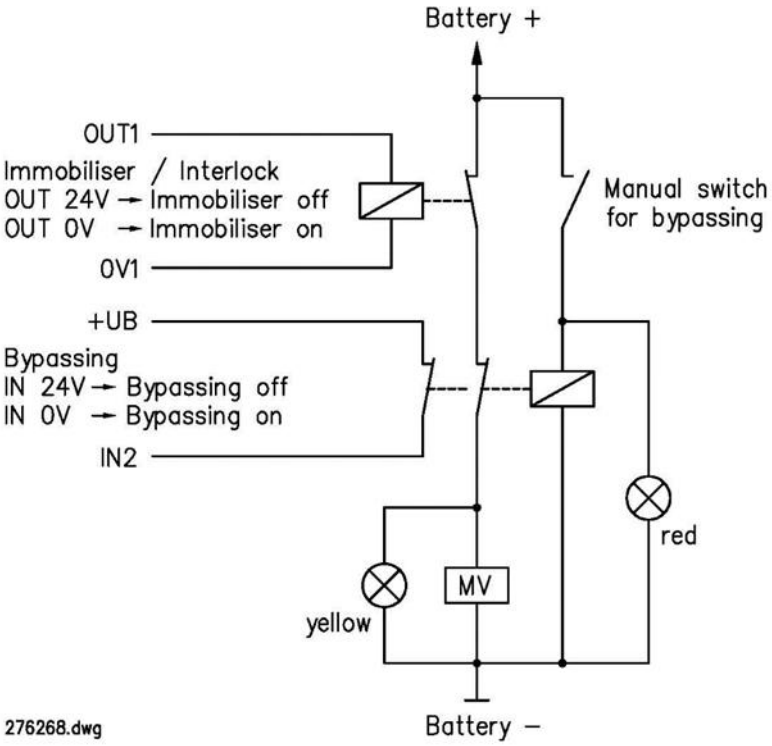
Interlock-controlled immobilizer and immobilizer bypass




| Terminal | Signal |
|---|---|
| 301 | +UB |
| 302 | OUT1 |
| 303 | IN1 |
| 304 | 0V1 |
| 309 | OUT3 |
| 310 | IN3 |
| 311 | 0V3 |
| 315 | OUT5 |
| 316 | IN5 |
| 317 | 0V5 |
| 321 | OUT7 |
| 322 | IN7 |
| 323 | 0V7 |
| 327 | OUT9 |
| 328 | IN9 |
| 329 | 0V9 |
| 333 | OUT11 |
| 334 | IN11 |
| 335 | 0V11 |
| 339 | OUT13 |
| 340 | IN13 |
| 341 | 0V13 |
| 345 | OUT15 |
| 346 | IN15 |
| 347 | 0V15 |

| Terminal | Signal |
|---|---|
| 305 | +UB |
| 306 | OUT2 |
| 307 | IN2 |
| 308 | 0V2 |
| 312 | OUT4 |
| 313 | IN4 |
| 314 | 0V4 |
| 318 | OUT6 |
| 319 | IN6 |
| 320 | 0V6 |
| 324 | OUT8 |
| 325 | IN8 |
| 326 | 0V8 |
| 330 | OUT10 |
| 331 | IN10 |
| 332 | 0V10 |
| 336 | OUT12 |
| 337 | IN12 |
| 338 | 0V12 |
| 342 | OUT14 |
| 343 | IN14 |
| 344 | 0V14 |
| 348 | OUT16 |
| 349 | IN16 |
| 350 | 0V16 |

276268.dwg




276268.dwg

## 6.5 COMM Ex e interface type 6932-102

### 6.5.1 Technical data

#### Electrical data

| | |
|---|---|
| Supply voltage electronic | DC 5.5 V, fuse 1 A |
| Supply voltage external devices RS232_2 | 24 V stabilised (6932-100 $U_{24V\_S}$) external |
| Interface USB | USB, Full speed, bus-powered, 12 Mbits/s |
| Interface RS232_1 | Rx, Tx, CTS, RTS, 115 K, galvanically isolated |
| Interface RS232_2 | Rx, Tx, CTS, RTS, 115 K, galvanically isolated |
| Interface RS232_3 | Rx, Tx, CTS, RTS, 115 K, galvanically isolated |
| Interface RS232_4 | Rx, Tx, galvanically isolated |
| Console (diagnosis) | Tx, 115 K, galvanically isolated |
| Interface RS 485 | Serial, asynchron, 9600 bit/s, RS485 (max. 115 K) |
| Interface P-NET | Serial, asynchron, 76800 bit/s, RS485 |
| Product ID | 6004 |
| System connection | USB, Full speed, self-powered, 12 Mbits/s via motherboard |

#### Ambient conditions

| | |
|---|---|
| Ambient temperature | -20 … +70 °C |
| Ambient temperature (inside the basic module) | -20 … +50 °C |
| Storage temperature | -20 … +50 °C |

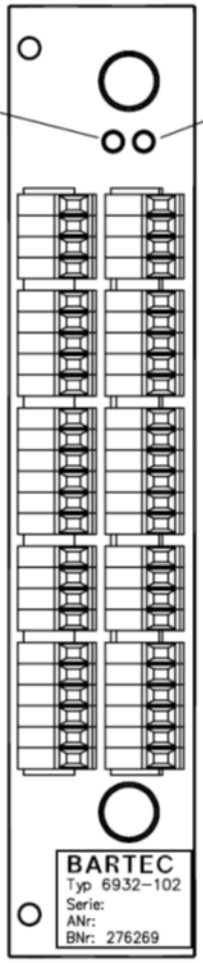
#### Mechanical data

| | |
|---|---|
| Weight | 2,5 N (250 g) |
| Cable connection | Clamp connection pluggable, 1,5 mm² |

#### Order details

| Designation | Order number |
|---|---|
| COMM Ex e interface type 6932-102 | 276269 |

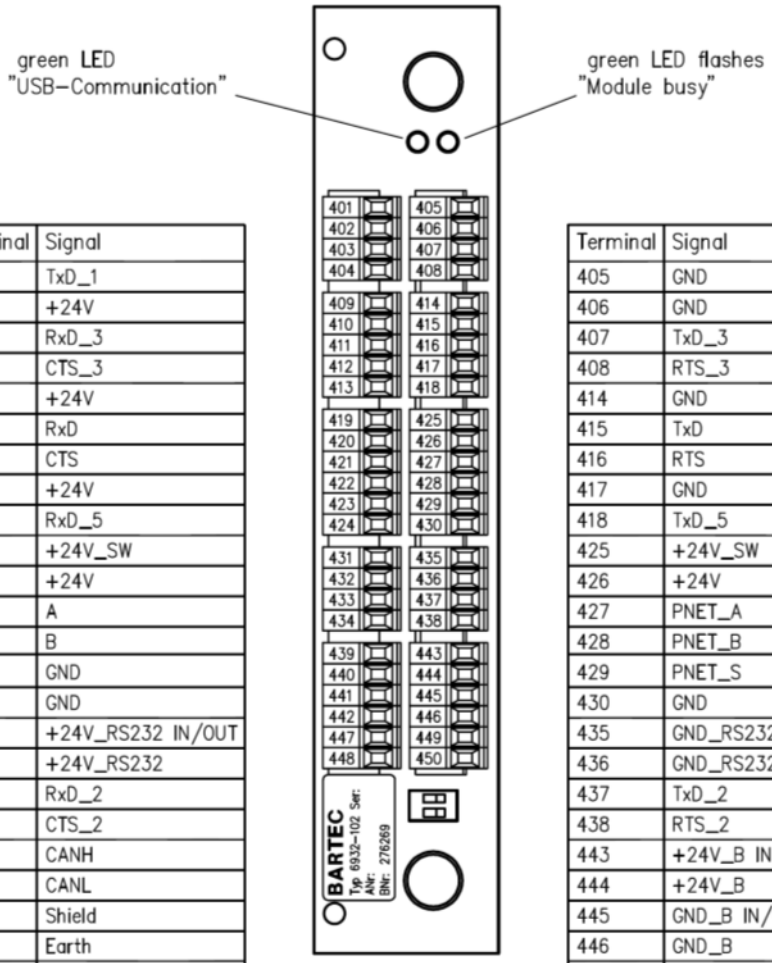
## 6.5.2 Terminal assignment up to series D




| Terminal | Signal |
|---|---|
| 401 | TxD_1 |
| 402 | +24V |
| 403 | RxD_3 |
| 404 | CTS_3 |
| 409 | +24V |
| 410 | RxD |
| 411 | CTS |
| 412 | +24V |
| 413 | RxD_5 |
| 419 | +24V_SW |
| 420 | +24V |
| 421 | A |
| 422 | B |
| 423 | GND |
| 424 | GND |
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 439 | CANH |
| 440 | CANL |
| 441 | Shield |
| 442 | Earth |
| 447 | D+ |
| 448 | D– |

| Terminal | Signal |
|---|---|
| 405 | GND |
| 406 | GND |
| 407 | TxD_3 |
| 408 | RTS_3 |
| 414 | GND |
| 415 | TxD |
| 416 | RTS |
| 417 | GND |
| 418 | TxD_5 |
| 425 | +24V_SW |
| 426 | +24V |
| 427 | PNET_A |
| 428 | PNET_B |
| 429 | PNET_S |
| 430 | GND |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |
| 443 | +24V_B IN/OUT |
| 444 | +24V_B |
| 445 | GND_B IN/OUT |
| 446 | GND_B |
| 449 | +5V |
| 450 | GND |

## 6.5.3 Terminal assignment from series E

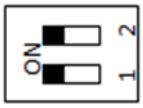



| Terminal | Signal |
|---|---|
| 401 | TxD_1 |
| 402 | +24V |
| 403 | RxD_3 |
| 404 | CTS_3 |
| 409 | +24V |
| 410 | RxD |
| 411 | CTS |
| 412 | +24V |
| 413 | RxD_5 |
| 419 | +24V_SW |
| 420 | +24V |
| 421 | A |
| 422 | B |
| 423 | GND |
| 424 | GND |
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 439 | CANH |
| 440 | CANL |
| 441 | Shield |
| 442 | Earth |
| 447 | D+ |
| 448 | D– |

| Terminal | Signal |
|---|---|
| 405 | GND |
| 406 | GND |
| 407 | TxD_3 |
| 408 | RTS_3 |
| 414 | GND |
| 415 | TxD |
| 416 | RTS |
| 417 | GND |
| 418 | TxD_5 |
| 425 | +24V_SW |
| 426 | +24V |
| 427 | PNET_A |
| 428 | PNET_B |
| 429 | PNET_S |
| 430 | GND |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |
| 443 | +24V_B IN/OUT |
| 444 | +24V_B |
| 445 | GND_B IN/OUT |
| 446 | GND_B |
| 449 | +5V |
| 450 | GND |

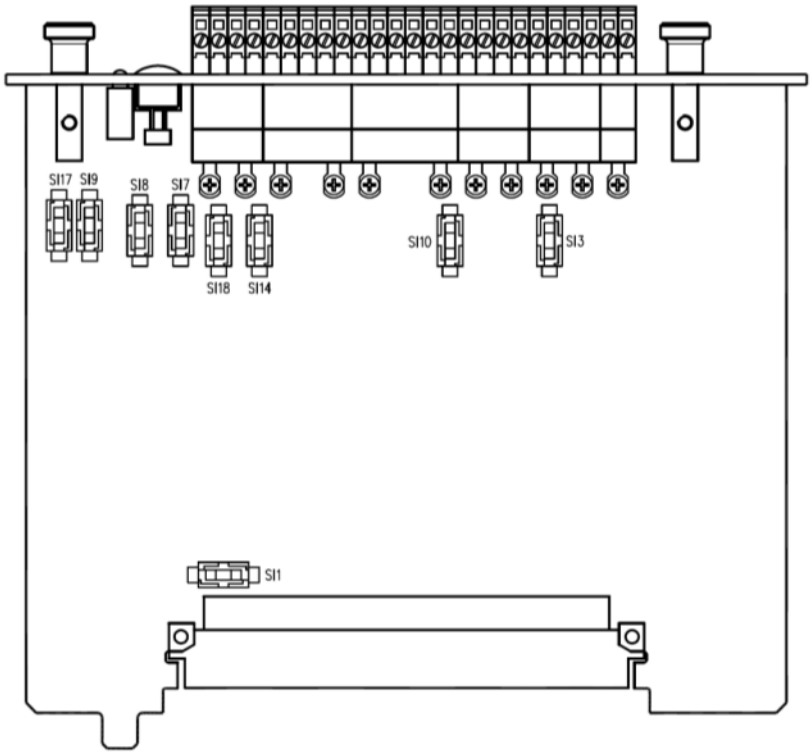
| WARNING! | |
|---|---|
| ⚠ | DIP switch:<br>The DIP switch settings must be in the ON position in order to be compatible with the Series smaller than E. |


OFF




ON

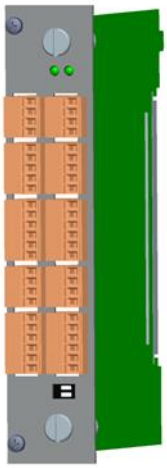
## 6.5.4 Fuse values up to series B




| Fuse | Description | Application | Value | Order No. |
|---|---|---|---|---|
| SI1 | CPU | | F 1.0A | 281772 |
| SI3 | CAN | ext. Inclination sensor | F 1.0A | 281772 |
| SI7 | RS232 (5) | GPS | F 3.5A | 286901 |
| SI8 | RS232 | | F 3.5A | 286901 |
| SI9 | RS232 (3) | | F 1.0A | 281772 |
| SI10 | RS232 (2) | | F 1.0A | 281772 |
| SI14 | RS485 | | F 1.0A | 281772 |
| SI17 | +24V_SW | Printer + Modem | T 3.5A | 233866 |
| SI18 | P-NET | | F 1.5A | 286900 |

For COMM Ex e Interface type 6932-102 the replaceable fuses are omitted from Series C!

## 6.6 COMM Ex e Interface aircraft, type 6932-117



### 6.6.1 Technical data

#### Electrical data

| | |
|---|---|
| Power supply electronic | DC 5,5 V, Fuse 1 A |
| Power supply external units<br>RS232_2/CAN | 24 V stabilised (6932-100 $U_{24V\_S}$)<br>external |
| Interface USB | USB, Full speed, bus-powered, 12 Mbits/s |
| Interface RS232_1 | Rx, Tx, CTS, RTS, 115 K, galvanically isolated |
| Interface RS232_2 | Rx, Tx, CTS, RTS, 115 K, galvanically isolated |
| Interface RS232_3 | Rx, Tx, CTS, RTS, 115 K, galvanically isolated |
| Interface RS232_4 | Rx, Tx , galvanically isolated |
| Console (diagnosis) | Tx, 115 K, galvanically isolated |
| Interface RS 485 | Serial, asynchronous, 9600 bit/s, RS485 (max. 115 K) |
| CAN interface<br>baud rate<br>Communications<br>CAN bus termination | CAN 2.0A/B<br>250 kBaud<br>Free protocol based on SAE J1939<br>Can be activated/deactivated |
| Product ID | 6004 |
| System connection | USB, Full speed, self-powered, 12 Mbits/s via Motherboard |

#### Ambient conditions

| | |
|---|---|
| Ambient temperature | -20 … +70 °C |
| Ambient temperature<br>(inside the basic module) | -20 … +50 °C |
| Storage temperature | -20 … +50 °C |

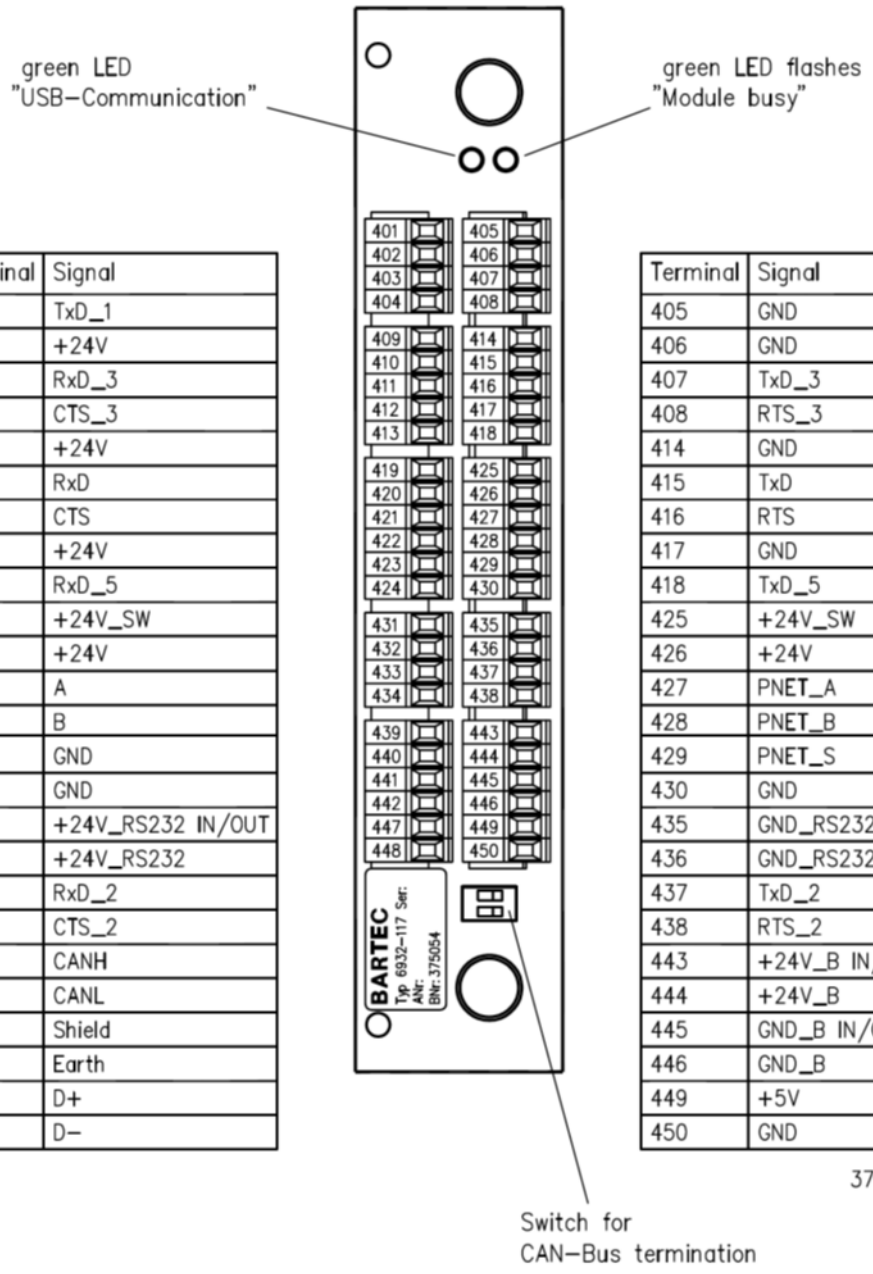
#### Mechanical data

| | |
|---|---|
| Weight | 2.5 N (250 g) |
| Cable connection | Terminal connection pluggable, 1.5 mm² |

#### Order details

| Designation | Order number |
|---|---|
| COMM Ex e Interface aircraft | 375054 |

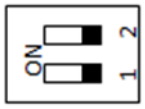
## 6.6.2 Terminal assignment



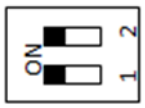

| Terminal | Signal |
|---|---|
| 401 | TxD_1 |
| 402 | +24V |
| 403 | RxD_3 |
| 404 | CTS_3 |
| 409 | +24V |
| 410 | RxD |
| 411 | CTS |
| 412 | +24V |
| 413 | RxD_5 |
| 419 | +24V_SW |
| 420 | +24V |
| 421 | A |
| 422 | B |
| 423 | GND |
| 424 | GND |
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 439 | CANH |
| 440 | CANL |
| 441 | Shield |
| 442 | Earth |
| 447 | D+ |
| 448 | D– |

| Terminal | Signal |
|---|---|
| 405 | GND |
| 406 | GND |
| 407 | TxD_3 |
| 408 | RTS_3 |
| 414 | GND |
| 415 | TxD |
| 416 | RTS |
| 417 | GND |
| 418 | TxD_5 |
| 425 | +24V_SW |
| 426 | +24V |
| 427 | PNET_A |
| 428 | PNET_B |
| 429 | PNET_S |
| 430 | GND |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |
| 443 | +24V_B IN/OUT |
| 444 | +24V_B |
| 445 | GND_B IN/OUT |
| 446 | GND_B |
| 449 | +5V |
| 450 | GND |

| WARNING! | |
|---|---|
| ⚠ | DIP switch:<br>The DIP switch settings must be in the ON position to be compatible with the series smaller than E. |

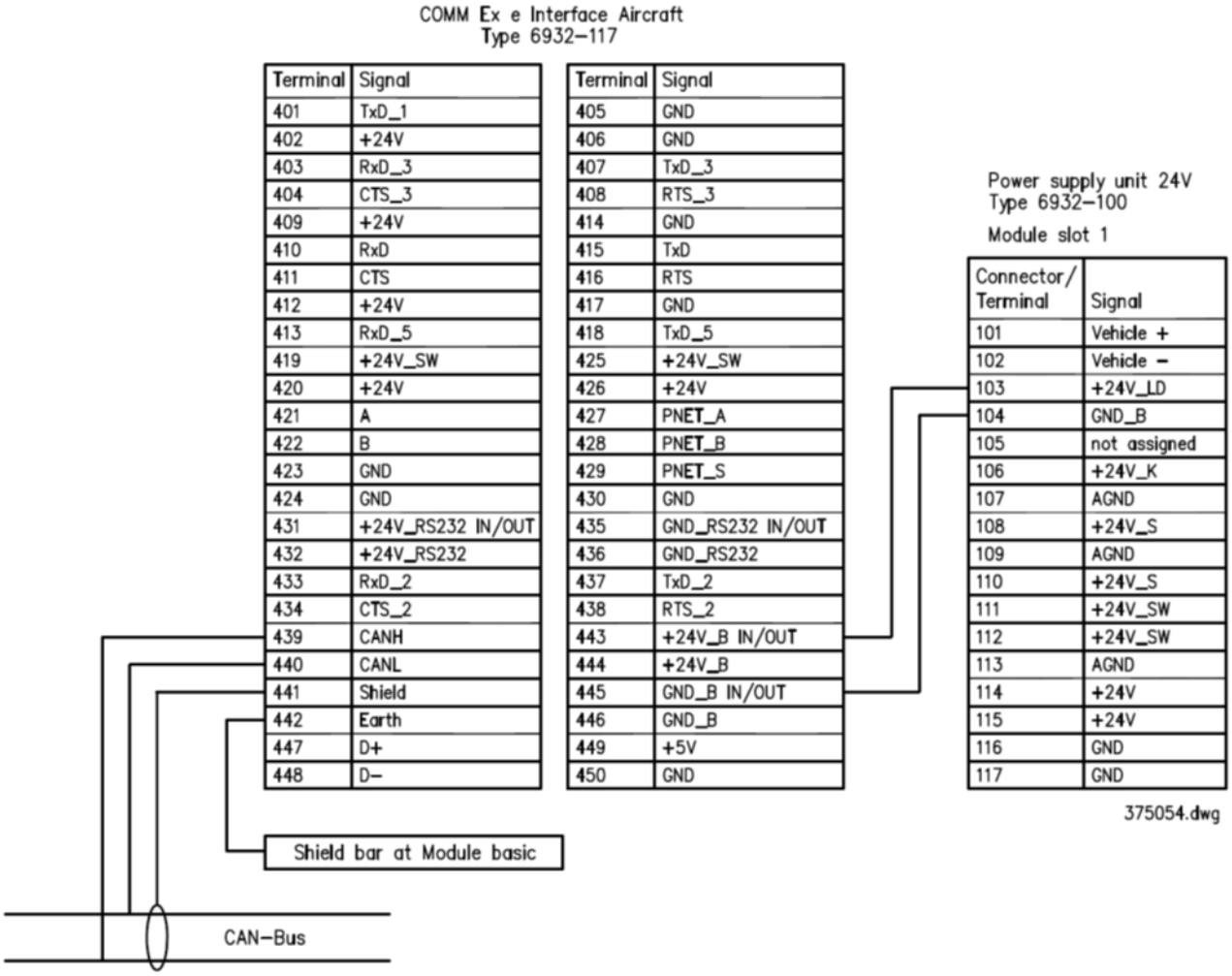



OFF




ON

## 6.6.3 CAN-Bus




| COMM Ex e Interface CAN type 6932-117 | Power supply unit 24V type 6932-100 | Basic module type 6932-10/11 | CAN-Bus line |
|---|---|---|---|
| 439 (CANH) | | | CAN_H |
| 440 (CANL) | | | CAN_L |
| 441 (shield) | | | CAN_SH |
| 442 (ground) | | Shield bar | |
| 443 (+24V_B IN/OUT) | 103 (+24V_LD) | | |
| 445 (GND_B IN/OUT) | 104 (GND_B) | | |

| WARNING! | |
|---|---|
| ⚠ | Power supply:<br>To supply the CAN-circuit the +24V_LD from the power supply unit 24V (type 6932-100) are used. GND_B corresponds to the „Power board“-potential. All bus clients must be on the same ground reference. |

At the same time all CAN-Bus-clients connected to the FFB system 3003 must be supplied with power.

**CAN Bus shielding:**

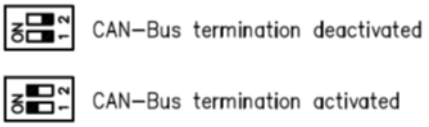
When using a shield the „Ground“ terminal (442) must be connected with the shield bar on the basic module.

**CAN Bus line:**

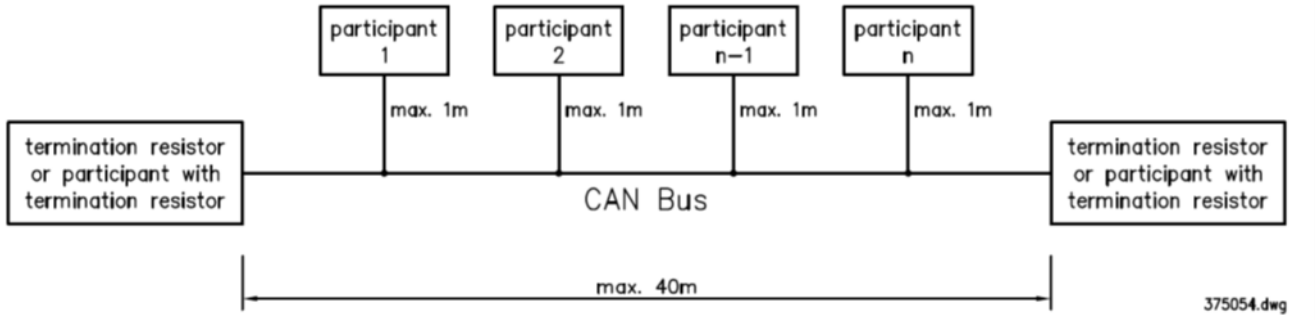
It should be used a bus line which is isolated twisted and compliant to the CAN system (e.g. UNITRONIC® BUS CAN FD P 1x2x0.5).

**CAN Bus termination:**

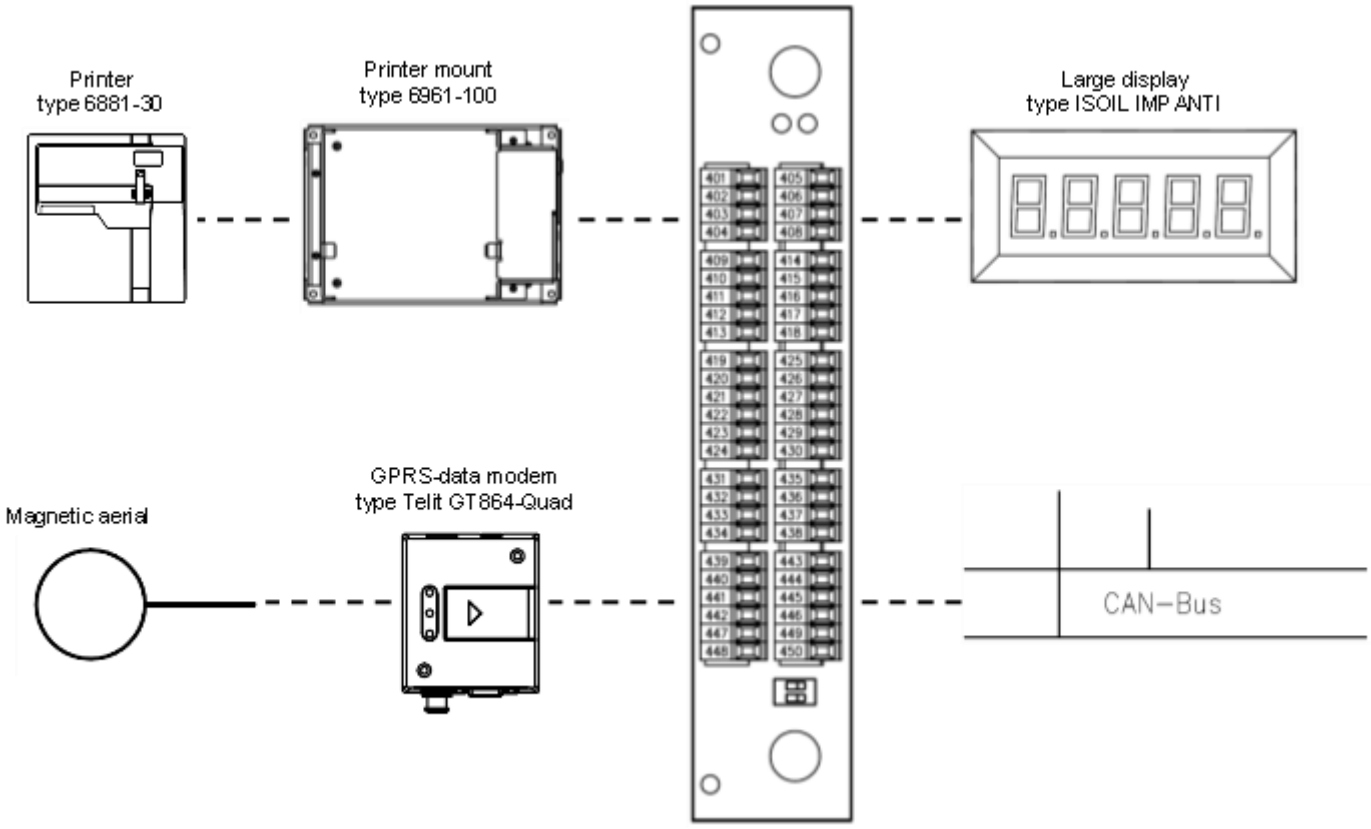
As required the CAN bus termination can be activated or deactivated via the DIP switch.




## 6.6.4 CAN Bus Topology



## 6.6.5 Overview



# 6.7 CPU type 6932-103

## 6.7.1 Technical data

### Electrical data

| | |
|---|---|
| Supply voltage | DC 5,5 V (800 mA) |
| Electronic | |
| Processor | MPC8270 Power PC (266 MHz) |
| Flash | 256 MB on board flash |
| SDRAM | 128 MB (CL3) |
| EEPROM | 4 x 32 k on board over SPI |
| Realtime clock | 32,768 kHz (battery buffered) |
| Compact Flash | All sizes |
| SRAM (battery buffered) | 4 MB on board SRAM for sensitive Data and files |
| Interfaces | |
| USB 2.0 Host | OHCI |
| Ethernet | 100 Mbit |
| Serial ports | 5 x up to 115200 bit/s; 3,3 V LVTTL<br>2 x up to 460800 bit/s; 3,3 V LVTTL |
| Display/Monitoring | up to 24 bit flat plane and/or crt |
| Output/Inputs | 8 outputs, 8 inputs (3,3 V LVTTL) |

### Ambient conditions

| | |
|---|---|
| Ambient temperature | -20 … +70 °C |
| Ambient temperature<br>(inside the basic module) | -20 … +50 °C |
| Storage temperature | -20 … +50 °C |

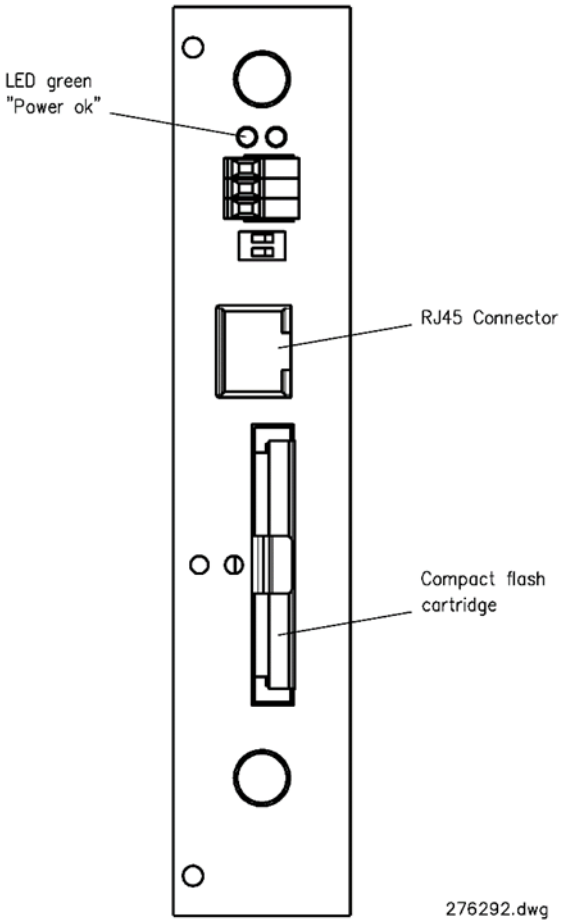
### Mechanical data

| | |
|---|---|
| Weight | 2,3 N (230 g) |
| Connection | RJ45 Jack (Ethernet), Compact Flash Socket |

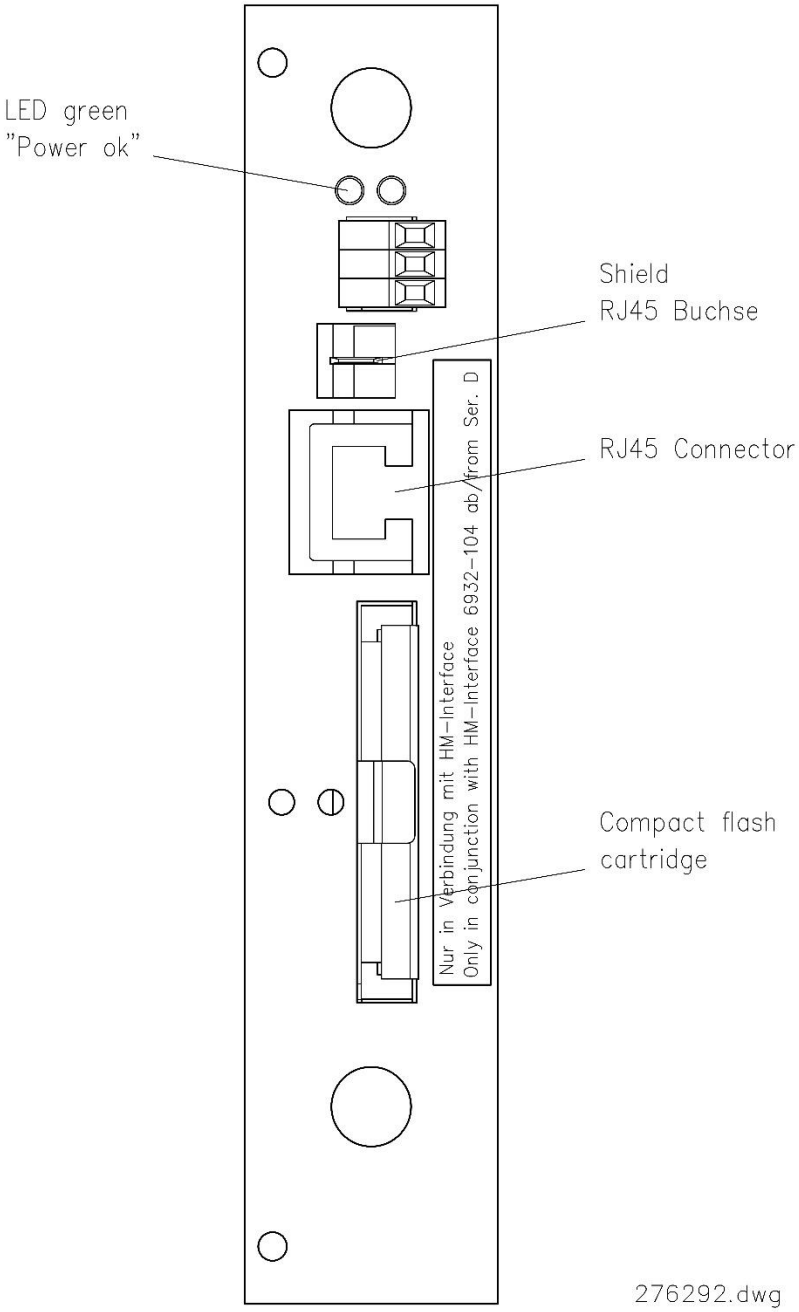
### Order details

| Designation | Order number |
|---|---|
| CPU type 6932-103 | 276292 |

## 6.7.2 Terminal assignment up to series C



## 6.7.3 Terminal assignment from series D




| WARNING! | |
|---|---|
| ⚠ | Please replace the compact flash card only when the power is off! |

## 6.8 HM Interface Ex type 6932-104

### 6.8.1 Technical data

**Electrical data**

| | |
|---|---|
| Supply voltage | Non-intrinsically safe supply circuit U_IN, GND_IN<br>(via 96 pole female multipoint connector SL1-1A/B/C, SL1-32A/B/C)<br>nominal voltage DC 5,5 V ± 2 %, Um ≈ 50 V<br>max. short-circuit protection 100 A (supply-limited) |
| Current | Max. 1.5 A |
| Safety | 2 x 250 mA |
| Warning light | 1 LED green (lock) per HMI touch screen |
| Interfaces | |
| Non-intrinsically safe<br>data interface | via 96 pole female multipoint connector SL1-7 - SL1-31<br>nominal voltage DC 5 V, Um ≈ 50 V |
| Intrinsically safe output current circuit<br>+U_B, -U_B Intrinsically safe output current circuit | Connections / terminals 601 (+U_B, SL3-6)<br>and 602 (-U_B, SL3-5) or connections / terminals 701<br>(+U_B, SL3-6) and 702 -U_B, SL3-5)<br>nominal voltage 5.0 V, nominal current 180 mA<br>$U_o$ ≈ DC 6 V, $I_o$ ≈ 600 mA, $I_s$ (fuse 250 mA) ≈ 425 mA<br>$P_o$ ≈ 1.5 W, trapezoid characteristic line ($U_q$ = 10 V, R = 16.6 Ω)<br>$C_i$ ≈ 85 µF, $L_i$ negligibly small<br><br>intrinsically safe output current circuit Ex ia IIB<br>$C_o$ ≈ 1000 µF, $L_o$ ≈ 0.4 mH<br>In case of simultaneous capacitances and inductances, the following applies:<br>$C_o$ ≈ 915 µF at $L_o$ ≈ 2 µH, $C_o$ ≈ 9 µF at $L_o$ ≈ 10 µH<br><br>Intrinsically-safe output current circuit Ex ia IIA<br>$C_o$ ≈ 1000 µF, $L_o$ ≈ 0.79 mH<br>In case of simultaneous capacitances and inductances, the following applies:<br>$C_o$ ≈ 915 µF at $L_o$ ≈ 2 µH, $C_o$ ≈ 55 µF at $L_o$ ≈ 10 µH |

| | |
|---|---|
| Intrinsically-safe output current circuit<br>+U_E, –U_E<br>with data interface R+, R- | Connections/terminals 604 (+U_E, SL3-8), 605<br>(-U_E, SL3-7), 606 (R+, SL3-2), 607 (R-, SL3-1) or<br>connections/terminals 704 (+U_E, SL3-8), 705<br>(-U_E, SL3-7), 706 (R+, SL3-2), 707 (R-, SL3-1)<br>nominal voltage 5.0 V, nominal current 75 mA<br>Uo ≈ DC 6 V, Io ≈ 450 mA . Po ≈ 1.1 W<br>trapezoid characteristic line (Uq = 9.23 V, R = 20.5 Ω)<br>Ci ≈ 15 µF, Li negligibly small<br><br>intrinsically-safe output current circuit Ex ia IIB<br>Co ≈ 1000 µF, Lo ≈ 0.7 mH<br>In case of simultaneous capacitances and inductances, the following applies:<br>Co ≈ 985 µF at Lo ≈ 2 µH, Co ≈ 195 µF - Ci at Lo ≈ 5 µH<br>Co ≈ 95 µF - Ci at Lo ≈ 9 µH, Co ≈ 80 µF - Ci at Lo ≈ 10 µH<br>Co ≈ 56 µF - Ci at Lo ≈ 15 µH, Co ≈ 10 µF - Ci at Lo ≈ 0.1 µH<br><br>intrinsically-safe output current circuit Ex ia IIA<br>Co ≈ 1000 µF, Lo ≈ 1.4 mH<br>n case of simultaneous capacitances and inductances, the following applies:<br>Co ≈ 985 µF at Lo ≈ 2 µH, Co ≈ 125 µF at Lo ≈ 10 µH<br>Co ≈ 85 µF at Lo ≈ 15 µH, Co ≈ 68 µF at Lo ≈ 20 µH<br>Co ≈ 21 µF at Lo ≈ 100 µH |
| Intrinsically safe<br>data protection circuit T+, T- | Connections / terminals 609 (T+, SL3-3), 610 (T-, SL3-4) or<br>connections/terminals 709 (T+, SL3-3), 710 (T-, SL3-4)<br>nominal voltage 5.0 V, Uo ≈ DC 6 V, Io ≈ 440 mA, Po ≈ 1.1 W<br>trapezoid characteristic line (Uq = 10 V, R = 22.7 Ω),<br>Ci ≈ 30 µF<br>Li negligibly small<br><br>Intrinsically-safe output current circuit Ex ia IIB<br>Co ≈ 1000 µF, Lo ≈ 0.73 mH<br>In case of simultaneous capacitances and inductances, the following applies:<br>Co ≈ 970 µF at Lo ≈ 2 µH, Co ≈ 65 µF at Lo ≈ 10 µH<br><br>Intrinsically-safe Ex ia IIA<br>Co ≈ 1000 µF, Lo ≈ 1.4 mH<br>In case of simultaneous capacitances and inductances, the following applies:<br>Co ≈ 970 µF at Lo ≈ 2 µH, Co ≈ 110 µF at Lo ≈ 10 µH<br>Co ≈ 6 µF at Lo ≈ 0.1 mH |

## Ambient conditions

| | |
|---|---|
| Ambient temperature | -20 … +70 °C |
| Ambient temperature<br>(inside the basic module) | -20 … +50 °C |
| Storage temperature | -20 … +50 °C |
| Protection type | IP00 as per DIN 40050 |
| Equipment group/category /<br>Ignition protection type | II (1) G [Ex ia Ga] IIB |
| EC-type examination<br>certificate<br>IECEx-certificate<br>Standards | BVS 07 ATEX E 178 X<br><br>IECEx BVS 14.0054X<br>IEC / EN 60079-0, IEC / EN 60079-11 |

## Mechanical data

| | |
|---|---|
| Weight | 2.0 N (200 g) |
| Connection | Plug-in terminal |

## Order details

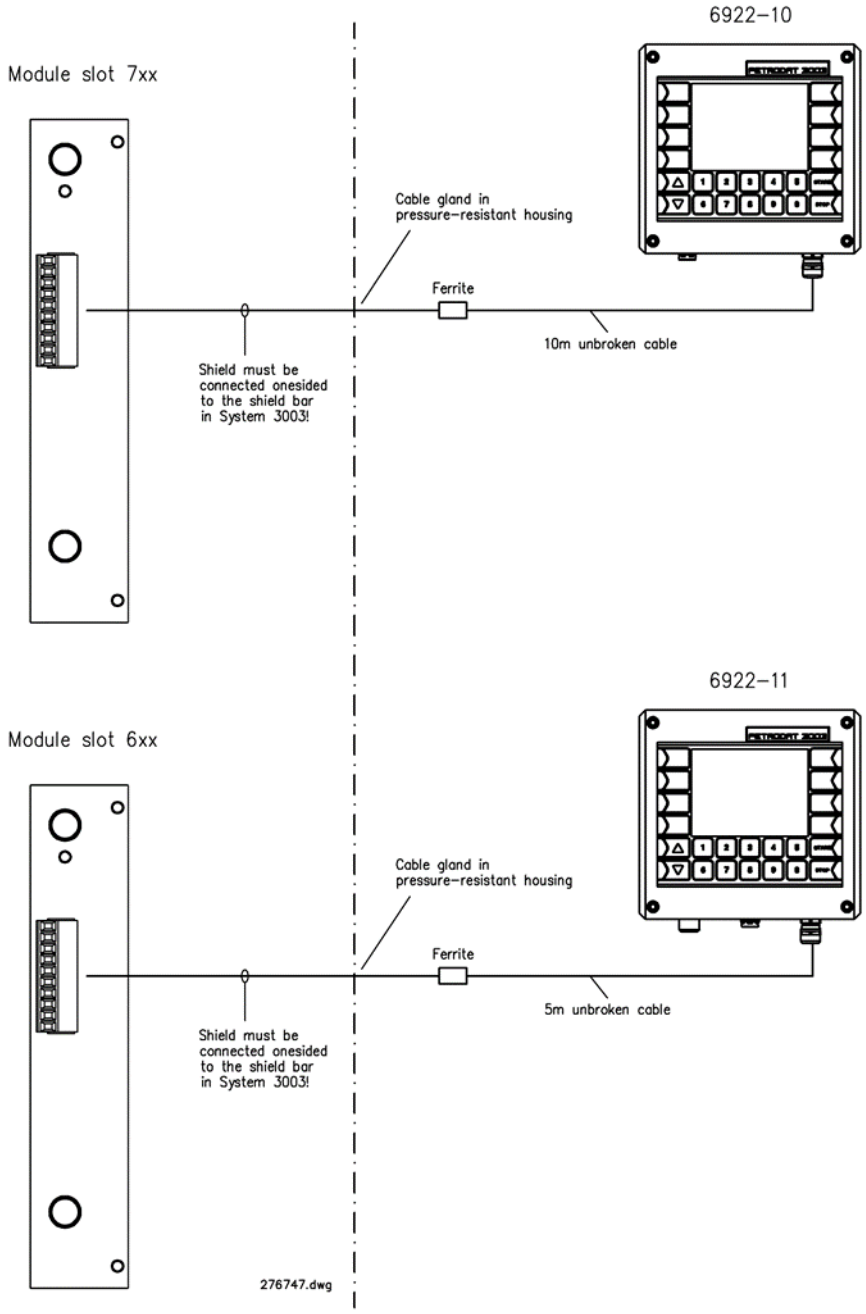
| Designation | Order number |
|---|---|
| HM Interface Ex type 6932-104 | 276747 |

### 6.8.2 Safety instructions

- The HM interface must be set up outside the explosive area.
- The HM interface must be installed in an enclosure with a protection grade of IP 20 pursuant to EN 60529.
- The HM interface is suited for use in a temperature range at the installation point of -20°C to + 70°C.
- The installation of the HM interface must be done so that the clearance of bare parts of intrinsically-safe circuits vis-a-vis metallic enclosure parts is at least 1.5 and vis-a-vis bare parts of non-intrinsically safe circuits is at least 4 mm and that the creepage distances of bare parts of intrinsically-safe circuits vis-a-vis bare parts of non-intrinsically safe circuits is at least 4 mm.
- The connector parts for the external intrinsically safe electrical circuits must be separated from the connector parts of non-intrinsically safe electrical circuits pursuant to Para. 6.2.1 of EN 60079-11:2007.
- The prospective maximum short-circuit current of the supply current circuit +5.5V (SL1) must be externally limited to a value of 100 A.

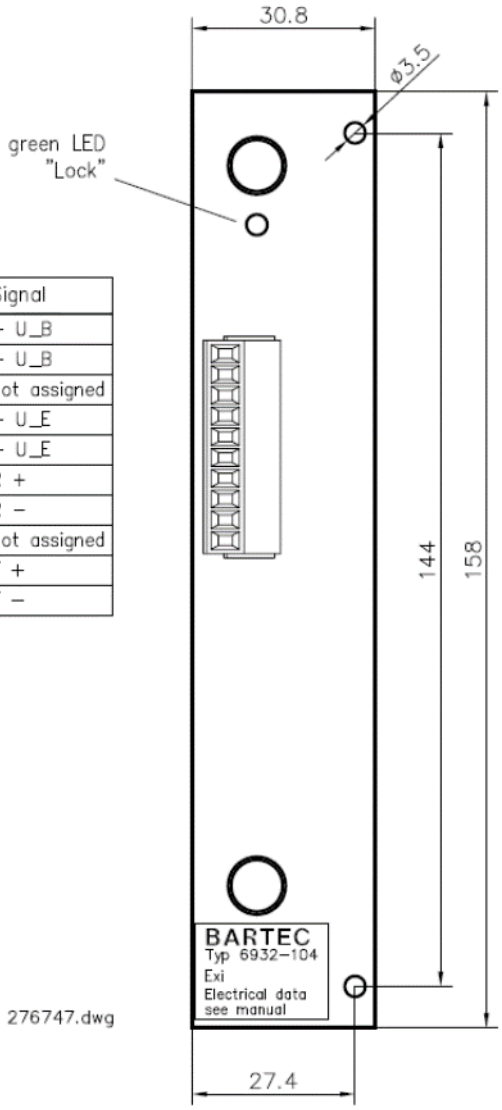
## 6.8.3 Connection plan for type 6922-10

(Module slot 7xx) or type 6922-11 (module slot 6xx)




| WARNING! | |
|---|---|
| ⚠ | Fit ferrite (order no.: 275368) externally on the housing of the display and operating unit directly after the cable gland and secure using heat-shrink sleeving.<br><br>When replacing the HM interface the black plug must be replaced with the orange plug if necessary. |

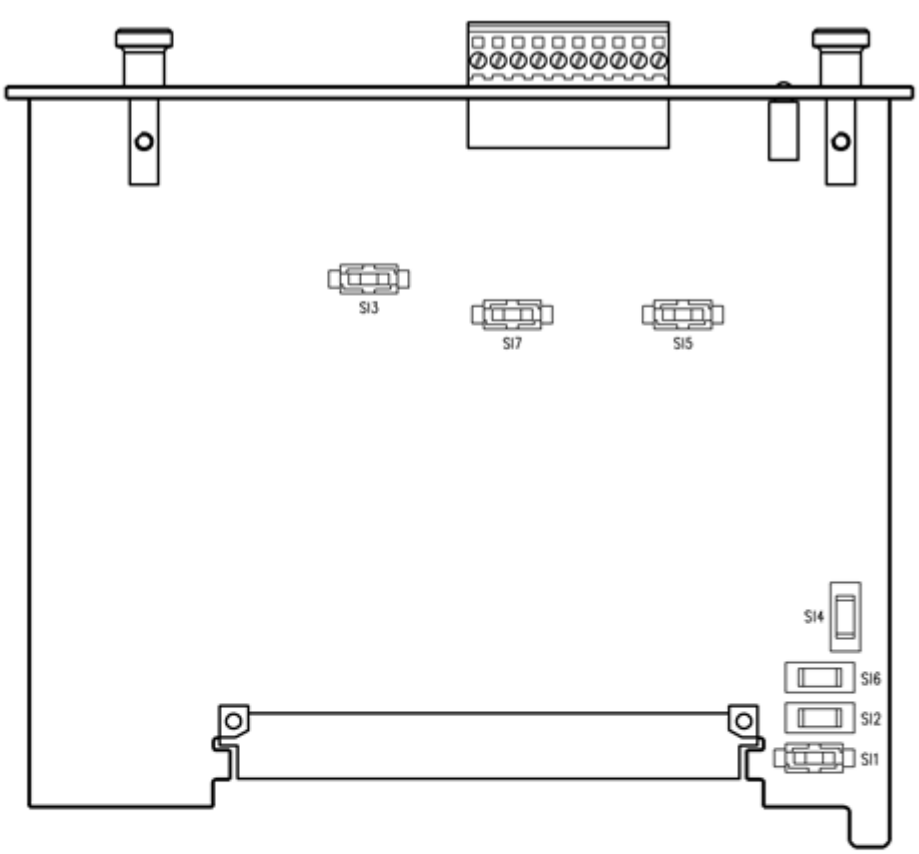
## 6.8.4 Terminal assignment




| Terminal | Signal |
|---|---|
| 601/701 | + U_B |
| 602/702 | – U_B |
| 603/703 | not assigned |
| 604/704 | + U_E |
| 605/705 | – U_E |
| 606/706 | R + |
| 607/707 | R – |
| 608/708 | not assigned |
| 609/709 | T + |
| 610/710 | T – |

| Terminals HM interface Ex<br>type 6932-104 | Display and operating unit<br>type 6922-10/-11 |
|---|---|
| 601 / 701 | +U_B (or) |
| 602 / 702 | - U_B (or/wh) (orange/white) 5V → SI5 and SI4 |
| 603 / 703 | n.c. |
| 604 / 704 | +U_E (rd/red) |
| 605 / 705 | - U_E (rd/wh) (red/white) 5V → SI6 and SI7 |
| 606 / 706 | R+ (gn) |
| 607 / 707 | R (gn/wh) (green/white) |
| 608 / 708 | n.c. |
| 609 / 709 | T + (bl) |
| 610 / 710 | T - (bl/wh) (blue/white) |

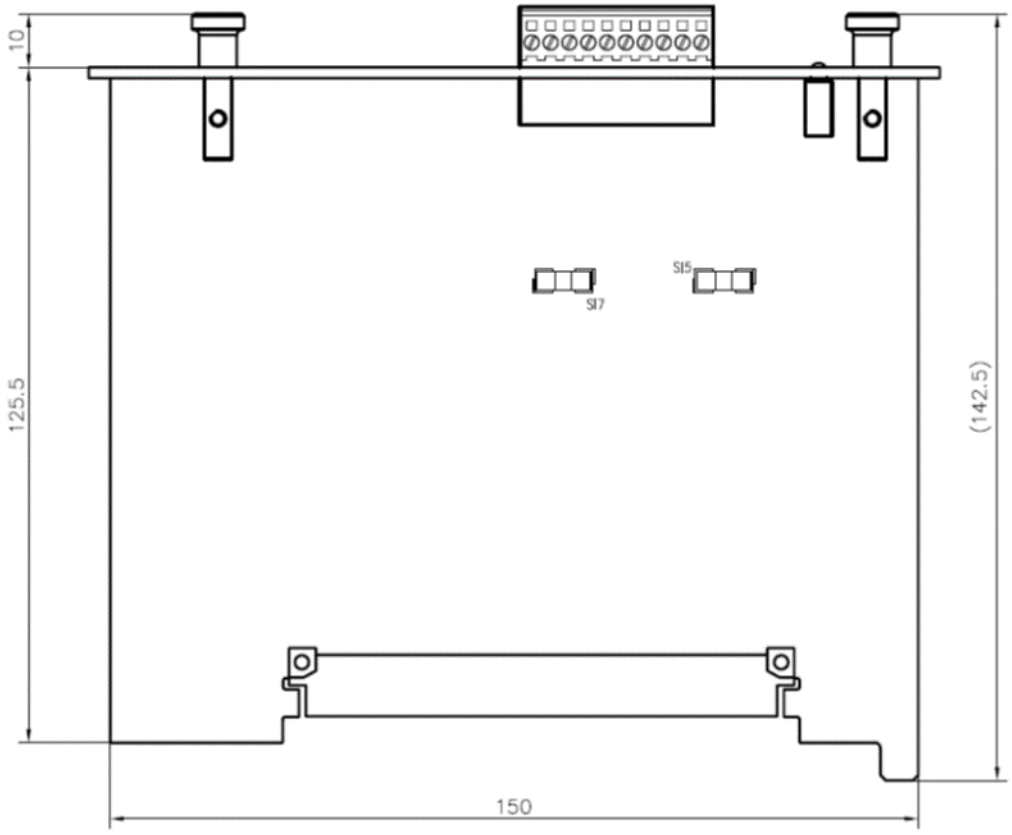
## 6.8.5 Fuse values without series




| Fuse | Description | Value | B No. |
|---|---|---|---|
| SI 1 | Supply, electronics** | F 250 mA | 281771 |
| SI 2 | 5.5 V_I primary (LVDS Transmitter + receiver) | T 1.0 A | 220273 |
| SI 3 | 5.5 V_I secondary (LVDS Transmitter + receiver) | F 250 mA | 288255 |
| SI 4 | U_B primary (Background lighting HMI) ** | T 1.0 A | 220273 |
| SI 5 | U_B secondary (Background lighting HMI) * | F 250 mA | 288255 |
| SI 6 | U_B primary (Electronics + Display HMI) ** | T 1.0 A | 220273 |
| SI 7 | U_B secondary (Electronics + Display HMI) * | F 250 mA | 288255 |

* intrinsically safe
** not intrinsically safe

## 6.8.6 Fuse values from series B




| Fuse | Description | Value | Order No. |
|---|---|---|---|
| SI5 | U_B secondary (Backlight HMI *) | T 250mA | 288255 |
| SI7 | U_B secondary (electronics + display HMI *) | T 250mA | 288255 |

*) intrinsically safe

276747.dwg

# 6.9 i-Box interface 4-20 mA type 6932-113

The interface card allows the connection of two i-Boxes-Namur (type 6912-11) and four 4 - 20 mA 2-wire sensors.

## 6.9.1 Technical data

### Electrical data

| | |
|---|---|
| Operating voltage | Non-intrinsically safe supply circuit +24V<br>(via 96 pole female multipoint connector SL1-5A/B/C (+24V_S), SL1-6A/B/C (AGND) )<br>nominal voltage DC 24V ± 10 %, Um ≈ 50 V,<br>Power consumption 0.3 A<br><br>Non-intrinsically safe supply circuit +5.5V<br>(via 96 pole female multipoint connector SL1-30A/B/C (+5.5V), SL1-32A/B/C (DGND) )<br>nominal voltage DC 5,5 V ± 2 %, Um ≈ 50 V<br>current consumption 0.3 A |
| Display | 1 LED green (status display) |
| Product ID | 6008 |
| Interfaces | |
| | USB full speed, self-powered, 12 MBit/s via motherboard |
| i-Box interface data interface | 2 x power modulated, 200 baud |
| Non-intrinsically safe data circuit, USB | (via 96 pole female multipoint connector SL1-28A (D6+) - SL1-28C (D6-), nominal voltage DC 5 V, Um ≈ 50 V |
| Intrinsically safe output current circuits "+8,4V_1", "+8,4V_2" | Terminals 801 (+8,4V_1), 802 (0V_1) or<br>terminals 803 (+8,4V_2), 804 (0V_2)<br>each<br>Ex ia IIB<br>nominal voltage DC 8.4 V, Uo ≈ DC 10 V, Io ≈ 480 mA<br>internal resistance 20.8 Ω, max. output power 1.2 W<br>linear characteristic line<br>Co ≈ 20 µF, Lo ≈ 0.01 mH<br>or<br>Co ≈ 10 µF, Lo ≈ 0.1 mH<br>or<br>Co ≈ 3.4 µF, Lo ≈ 1 mH |

| | |
|---|---|
| Intrinsically safe bidirectional data interfaces "ManU_talk_1", "ManU_talk_2" | Terminals 805 (ManU_talk_1), 802 (0V_1), or terminals 806 (ManU_talk_2), 804 (0V_2) each<br>Ex ia IIB<br>nominal voltage DC 8.4 V, Ui ≈ DC 10 V, Ci ≈ 0 µF<br>Li ≈ 0 µH, Uo ≈ DC 10 V, Io ≈ 100 mA<br>internal resistance 100 Ω<br>linear characteristic line<br>Po ≈ 250 mW, Co ≈ 20 µF, Lo ≈ 0.01 mH<br>or<br>Co ≈ 11 µF, Lo ≈ 0.1 mH<br>or<br>Co ≈ 5.4 µF, Lo ≈ 1 mH |
| Intrinsically safe signal circuit 4-20 mA | Signal circuit 1:<br>Terminals 807 (+24V_4/20), 808 (4-20mA_1) or<br>Signal circuit 2:<br>Terminals 810 (+24V_4/20), 811 (4-20mA_2) or<br>Signal circuit 3:<br>Terminals 812 (+24V_4/20), 813 (4-20mA_3) or<br>Signal circuit 4:<br>Terminals 815 (+24V_4/20), 816 (4-20mA_3) or<br><br>Ex ia IIB<br>Nominal voltage DC 24 V, DC 23 ± 5 % V, Uo ≈ DC 30 V<br>Io ≈ 100 mA, internal impedance 300 Ω<br>linear characteristic<br>Po ≈ 0.75 W<br>in the simultaneous presence of capacities and inductors applies:<br>Co ≈ 0.49 µF, Lo ≈ 10 mH<br>or<br>Co ≈ 0.43 µF, Lo ≈ 0.1 mH<br>or<br>Co ≈ 0.39 µF, Lo ≈ 0.2 mH<br>or<br>Co ≈ 0.33 µF, Lo ≈ 0.5 mH<br>or<br>Co ≈ 0.27 µF, Lo ≈ 1.0 mH |

### Device-specific Data

| | |
|---|---|
| Nominal conditions | 23 ± 2 °C |

### Ambient conditions

| | |
|---|---|
| Operating temperature | - 20 °C … + 70 °C |
| Operating temperature (inside the basic module) | - 20 °C … + 50 °C |
| Storage temperature | - 20 °C … + 50 °C |
| Climatic class | JWF according to DIN 40040 |
| Protection type | IP 00 |
| Equipment group/-category / Ignition protection type | II (1) G [Ex ia] IIB |
| EG-type examination certificate | BVS 10 ATEX E 006 |

### Mechanical data

| | |
|---|---|
| Dimensions | see dimensional drawing |
| Weight | 175 g |
| System connection | Plug-in card |
| Connections | Terminals 1,5 mm² pluggable |

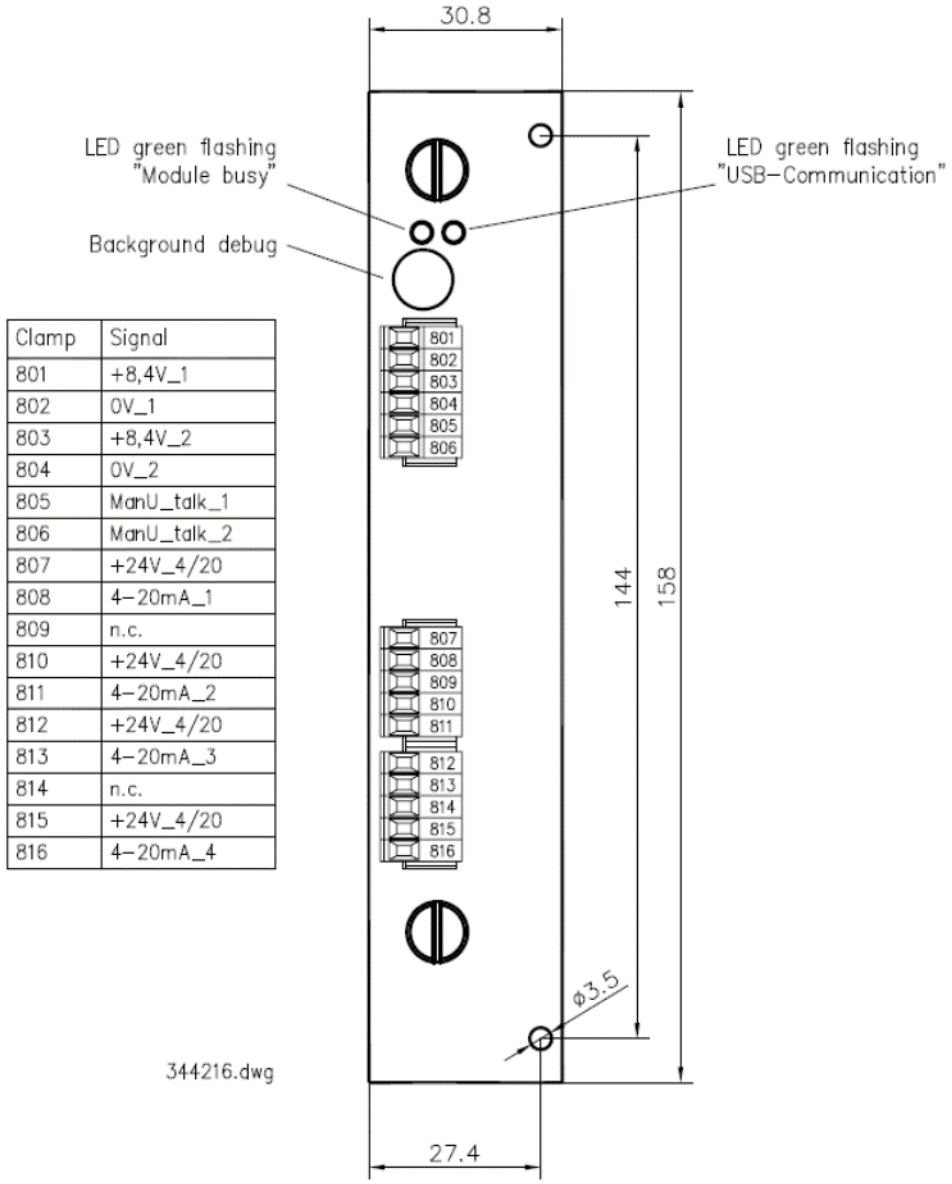
### Order details

| Designation | Order number |
|---|---|
| i-Box interface 4-20 mA type 6932-113 | 344216 |

## 6.9.2 Safety instructions

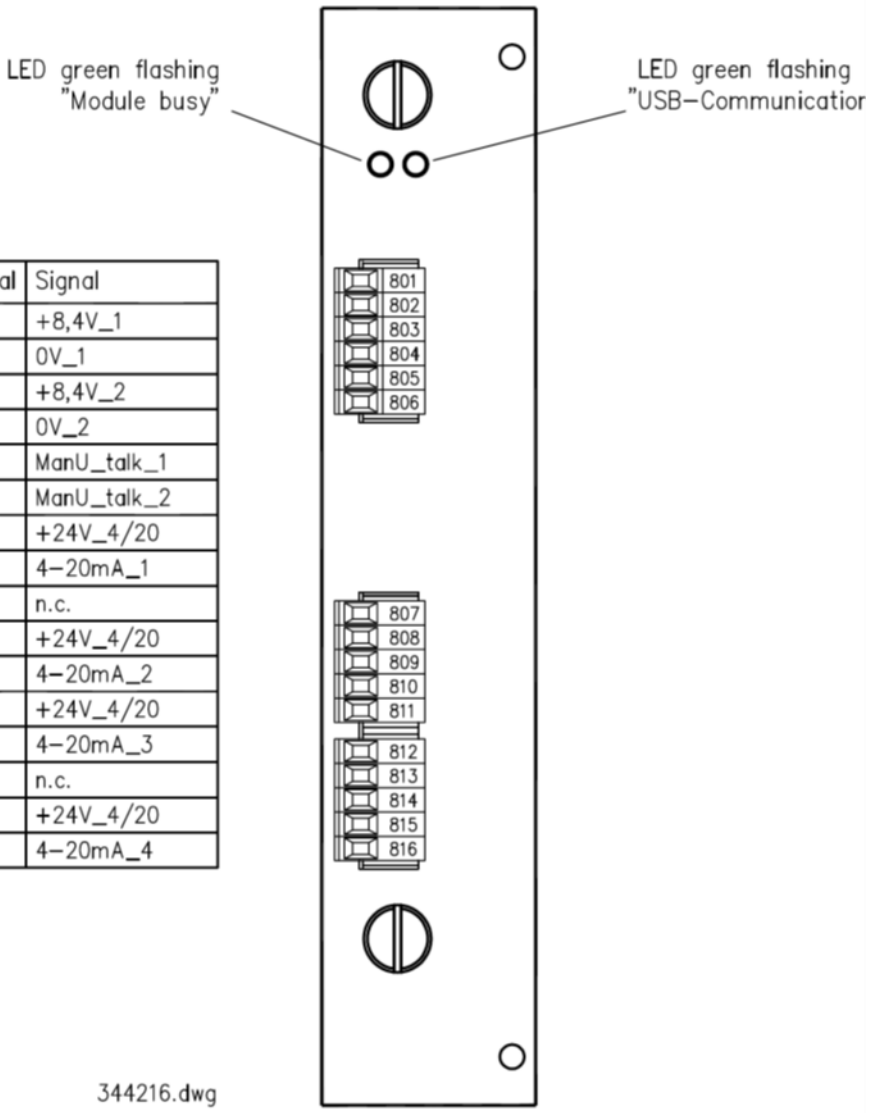
- The i-Box interface must be set up outside the explosive area. Note: For operation inside the explosive area, the i-Box interface can be installed in a pressure-resistant housing per EN 60079-1 (pressure-resistant encapsulation "d"), which must be examined separately for this purpose.
- The i-Box interface must be installed in an enclosure with a protection grade of IP 20 pursuant to EN 60529.
- The i-Box interface is suited for use in a temperature range at the installation point of -20°C to + 70°C.
- The installation of the i-Box interface must be done so that the clearance of bare parts of intrinsically-safe circuits vis-a-vis metallic enclosure parts is at least 1.5 and vis-a-vis bare parts of non-intrinsically safe circuits is at least 4 mm and that the creepage distances of bare parts of intrinsically-safe circuits vis-a-vis bare parts of non-intrinsically safe circuits is at least 4 mm.
- The connector parts for the external intrinsically safe electrical circuits must be separated from the connector parts of non-intrinsically safe electrical circuits pursuant to Para. 6.2.1 of EN 60079-11:2012.

## 6.9.3 Terminal assign. before series A



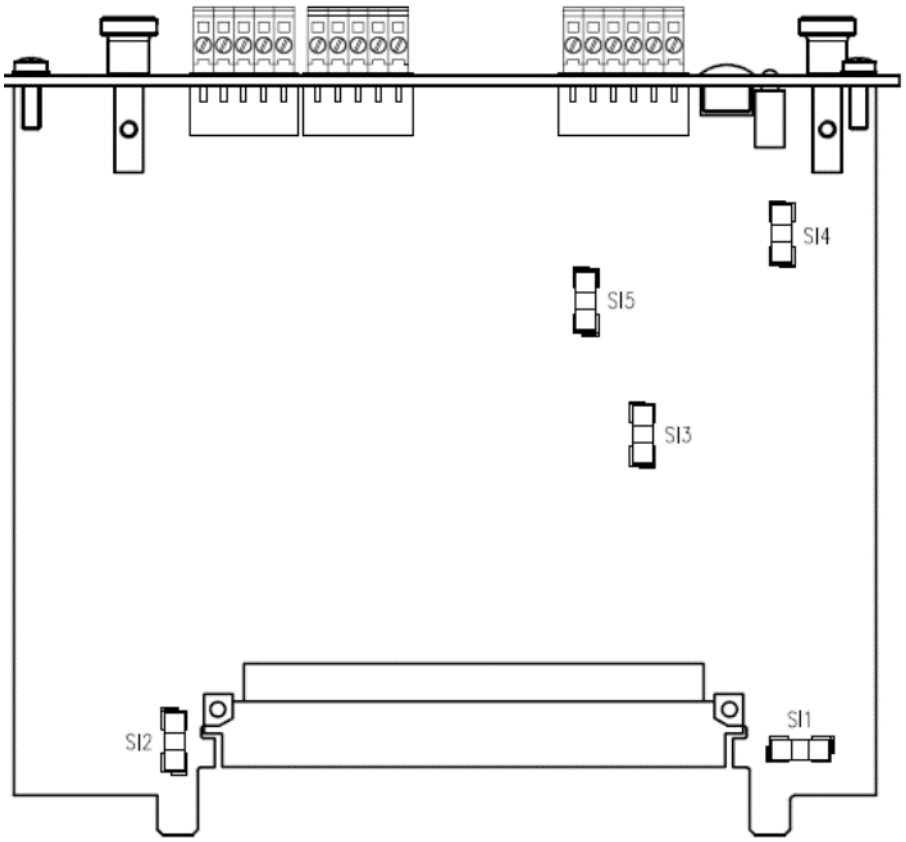

| Clamp | Signal |
|---|---|
| 801 | +8,4V_1 |
| 802 | 0V_1 |
| 803 | +8,4V_2 |
| 804 | 0V_2 |
| 805 | ManU_talk_1 |
| 806 | ManU_talk_2 |
| 807 | +24V_4/20 |
| 808 | 4–20mA_1 |
| 809 | n.c. |
| 810 | +24V_4/20 |
| 811 | 4–20mA_2 |
| 812 | +24V_4/20 |
| 813 | 4–20mA_3 |
| 814 | n.c. |
| 815 | +24V_4/20 |
| 816 | 4–20mA_4 |

## 6.9.4 Terminal assign. from series A




| Terminal | Signal |
|---|---|
| 801 | +8,4V_1 |
| 802 | 0V_1 |
| 803 | +8,4V_2 |
| 804 | 0V_2 |
| 805 | ManU_talk_1 |
| 806 | ManU_talk_2 |
| 807 | +24V_4/20 |
| 808 | 4–20mA_1 |
| 809 | n.c. |
| 810 | +24V_4/20 |
| 811 | 4–20mA_2 |
| 812 | +24V_4/20 |
| 813 | 4–20mA_3 |
| 814 | n.c. |
| 815 | +24V_4/20 |
| 816 | 4–20mA_4 |

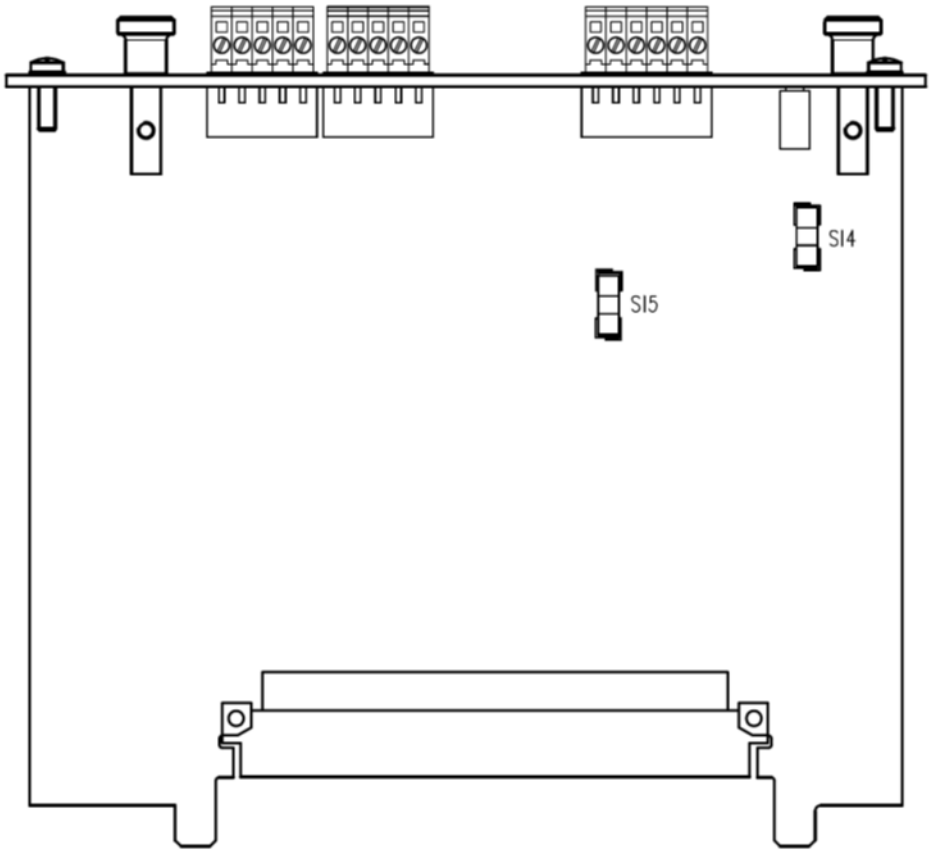
## 6.9.5 Fuse values before series A




| Fuse | Description | Value | Order No. |
|---|---|---|---|
| SI1 | 24V Power supply electronic system | T 1.0A | 292336 |
| SI2 | 5,5V Power supply electronic system | T 250mA | 288255 |
| SI3 | 5V CPU | T 125mA | 292349 |
| SI4 | 8,4V Power supply I-Boxes | T 100mA | 291908 |
| SI5 | 24V 4-20mA sensor system | T 125mA | 292349 |

344216.dwg

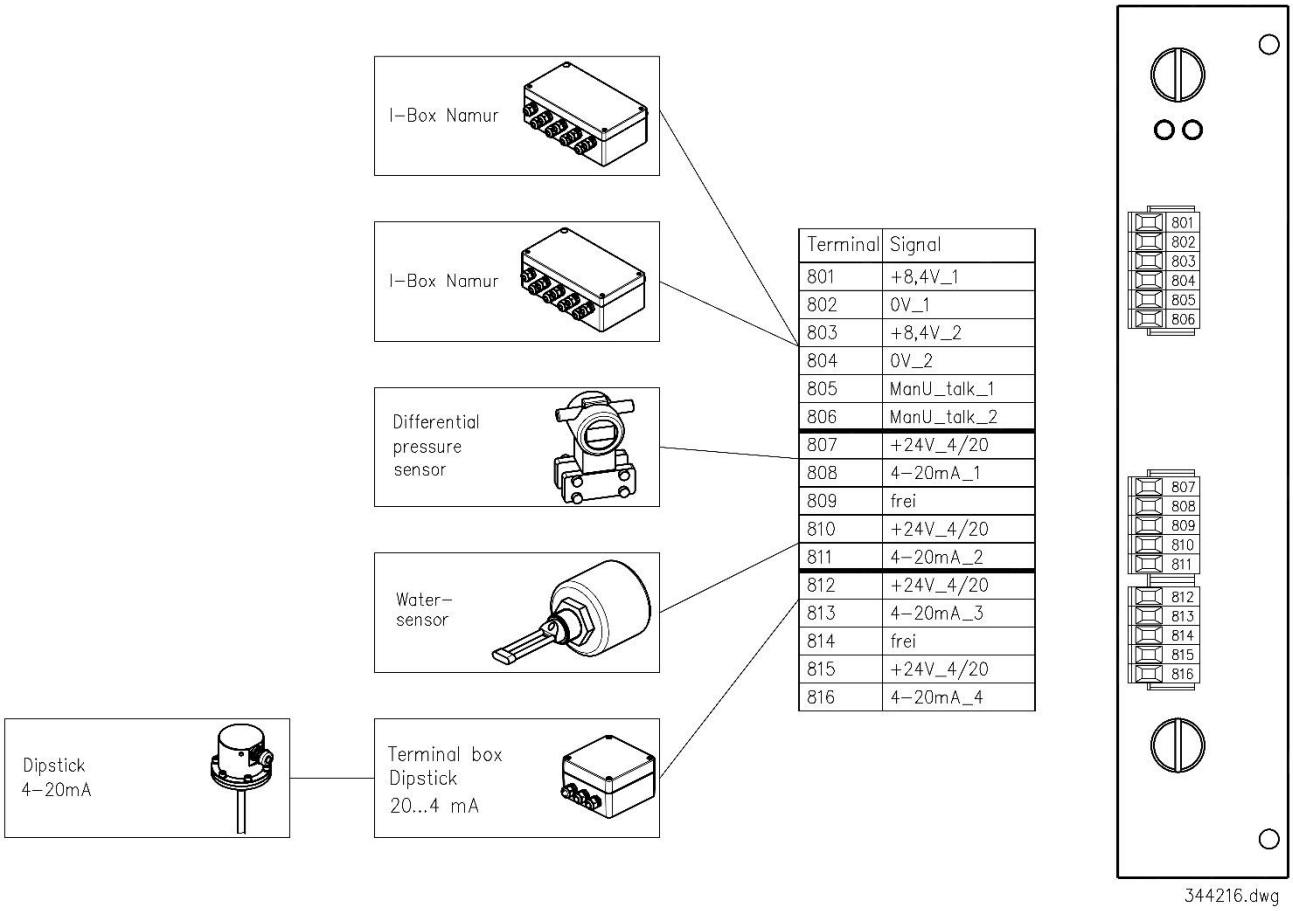
## 6.9.6 Fuse values from series A




| Fuse | Description | Value | Order No. |
|---|---|---|---|
| SI4 | 8,4V Power supply I–Boxes | T 100mA | 291908 |
| SI5 | 24V 4–20mA sensor system | T 125mA | 292349 |

344216.dwg

## 6.9.7 Block diagram



# 6.10 3/2K-interface dual Ex i type 6932-105

## 6.10.1 Technical data

### Electrical data

| | |
|---|---|
| Power supply | Non-intrinsically safe supply circuit +24V<br>(via 96 pole female multipoint connector SL1-5A/B/C (+24V_S), SL1-6A/B/C)<br>nominal voltage DC 24V ± 10 %, Um ≈ 50 V,<br>Power consumption 0.5 A<br><br>Non-intrinsically safe supply circuit +5.5V<br>(via 96 pole female multipoint connector SL1-30A/B/C (+5.5V), SL1-32A/B/C)<br>nominal voltage DC 5,5 V ± 2 %, Um ≈ 50 V<br>current consumption 0.2 A |
| Display | 1 LED green (status display) |
| Interfaces | |
| Non-intrinsically safe data circuit, HART-modem | (via 96 pole female multipoint connector SL1-7A - SL1-7C)<br>Nominal voltage DC 5 V, Um ≈ 50 V |
| Non-intrinsically safe data circuit D6 | (via 96 pole female multipoint connector SL1-28A - SL1-28C), Nominal voltage DC 5 V, Um ≈ 50 V |
| System interface | USB Fullspeed, self-powered, 12 Mbit/s via motherboard |
| PT100-interface | 2 x PT100 4L<br>1 mA, -20 … +60 °C, < 0,1 °C |
| Pulse counter interface | 2 x 3-channel/2-channel (associated measuring devices or turbines) max. 500 impulse/sec per channel. |
| Transmission rate | 12 Mbits/s |
| Produkt ID | 6000 |
| HART | Internal HART-Modem (4-20 mA, 1200 Bit/sec) |
| Intrinsically safe signal circuit<br>Impuls K1, Variant 1 or Impuls K2, Variant 1<br>(see wiring diagram) | Variant 1 (Eltomatic)<br>Connections / Terminals x06, x07, x08, x09, x10<br>(Bridge x11 - x13) or<br>Anschlüsse / Klemmen x31, x32, x33, x34, x35<br>(Bridge x36 - x38)<br>each<br>Nominal voltage 5 V<br><br>Intrinsically safe output circuit Ex ia<br>$U_o$ ≈ DC 6 V, $I_o$ ≈ 0.26 A, $P_o$ ≈ 0.95 W, $U_q$ ≈ 15 V, R ≈ 56.8 Ω, $C_i$ ≈ 35 µF, $L_i$ ≈ 10 µH<br><br>Group IIB<br>in case of simultaneous inductances and capacitances,<br>the following applies:<br>$C_o$ ≈ 36 µF - $C_i$ at $L_o$ ≈ 50 µH - $L_i$ |

| | |
|---|---|
| Intrinsically safe signal circuit<br>Impuls K1, Variant 6 or<br>Impuls K2, Variant 6<br>(see wiring diagram) | Variant 6 (NAMUR)<br>Connections / Terminals x04, x05, x07, x08<br>(Bridge x15 - x17) or<br>Connections / Terminals x29, x30, x32, x33<br>(Bridge x40 - x42)<br>each<br>Nominal voltage 8.2 V<br><br>Intrinsically safe output circuit Ex ia<br>$U_o \approx$ DC 10 V, $I_o \approx$ 40 mA, $P_o \approx$ 100 mW, R ≈ 250 Ω,<br>$C_i$ negligibly small, $L_i \approx$ 10 µH<br><br>Group IIC<br>in case of simultaneous inductances and capacitances,<br>the following applies:<br>$C_o \approx$ 2.3 µF - $C_i$ at $L_o \approx$ 50 µH - $L_i$<br>$C_o \approx$ 1.2 µF - $C_i$ at $L_o \approx$ 0.5 µH - $L_i$<br>$C_o \approx$ 1.0 µF - $C_i$ at $L_o \approx$ 1 µH - $L_i$<br><br>Group IIB<br>in case of simultaneous inductances and capacitances,<br>the following applies:<br>$C_o \approx$ 14 µF - $C_i$ at $L_o \approx$ 50 µH - $L_i$<br>$C_o \approx$ 6.8 µF - $C_i$ at $L_o \approx$ 0.5 µH - $L_i$<br>$C_o \approx$ 5.7 µF - $C_i$ at $L_o \approx$ 1 µH - $L_i$ |
| Intrinsically safe signal circuit Pt100_1 und Pt100_2 | Connections / Terminals x19, x20, x21, x22 und x44, x45, x46, x47<br>Nominal voltage 5 V<br><br>Intrinsically safe output circuit Ex ia<br>Uo ≈ DC 6 V, Io ≈ 30 mA, Po ≈ 45 mW, R ≈ 200 Ω,<br>Ci negligibly small, Li ≈ 100 µH<br><br>Intrinsically safe output circuit Ex ia<br>Uo ≈ DC 6 V, Io ≈ 30 mA, Po ≈ 45 mW, R ≈ 200 Ω,<br>Ci ≈ 50 nF , Li ≈ 1 µH<br><br>Group IIC<br>in case of simultaneous inductances and capacitances,<br>the following applies:<br>Co ≈ 2.6 µF - Ci at Lo ≈ 1 µH - Li<br>Co ≈ 2.2 µF - Ci at Lo ≈ 2 µH - Li<br><br>Group IIB<br>in case of simultaneous inductances and capacitances,<br>the following applies:<br>Co ≈ 15 µF - Ci at Lo ≈ 1 µH - Li<br>Co ≈ 12 µF - Ci at Lo ≈ 2 µH - Li |
| Intrinsically safe signal circuit<br>4-20 mA, HART | Connections / Terminals x24 ( + 4-20mA), x25 ( - 4-20mA)<br>Nominal voltage 24 V<br><br>Intrinsically safe output circuit Ex ia<br>$U_o \approx$ DC 28 V, $I_o \approx$ 100 mA, $P_o \approx$ 0.7 W, R ≈ 280 Ω,<br>$C_i$ negligibly small, $L_i$ negligibly small<br><br>Group IIC<br>in case of simultaneous inductances and capacitances,<br>the following applies:<br>$C_o \approx$ 83 nF - $C_i$ at $L_o \approx$ 0.2 µH,<br>$C_o \approx$ 66 nF - $C_i$ at $L_o \approx$ 0.5 µH<br><br>Group IIB<br>in case of simultaneous inductances and capacitances,<br>the following applies:<br>$C_o \approx$ 650 nF - $C_i$ at $L_o \approx$ 0.1 µH<br>$C_o \approx$ 350 nF - $C_i$ at $L_o \approx$ 1 µH |

## Device-specific Data

| | |
|---|---|
| Nominal conditions | 23 ± 2 °C |

### Ambient conditions

| | |
|---|---|
| Operating temperature | - 20 °C … + 70 °C |
| Operating temperature (inside the basic module) | - 20 °C … + 50 °C |
| Storage temperature | - 20 °C … + 50 °C |
| Climatic class | JWF according to DIN 40040 |
| Protection type | IP00 |

### Mechanical data

| | |
|---|---|
| Weight | 2 N (0.2 kg) |
| Connection | Plug-in terminals (mechanical seals) |

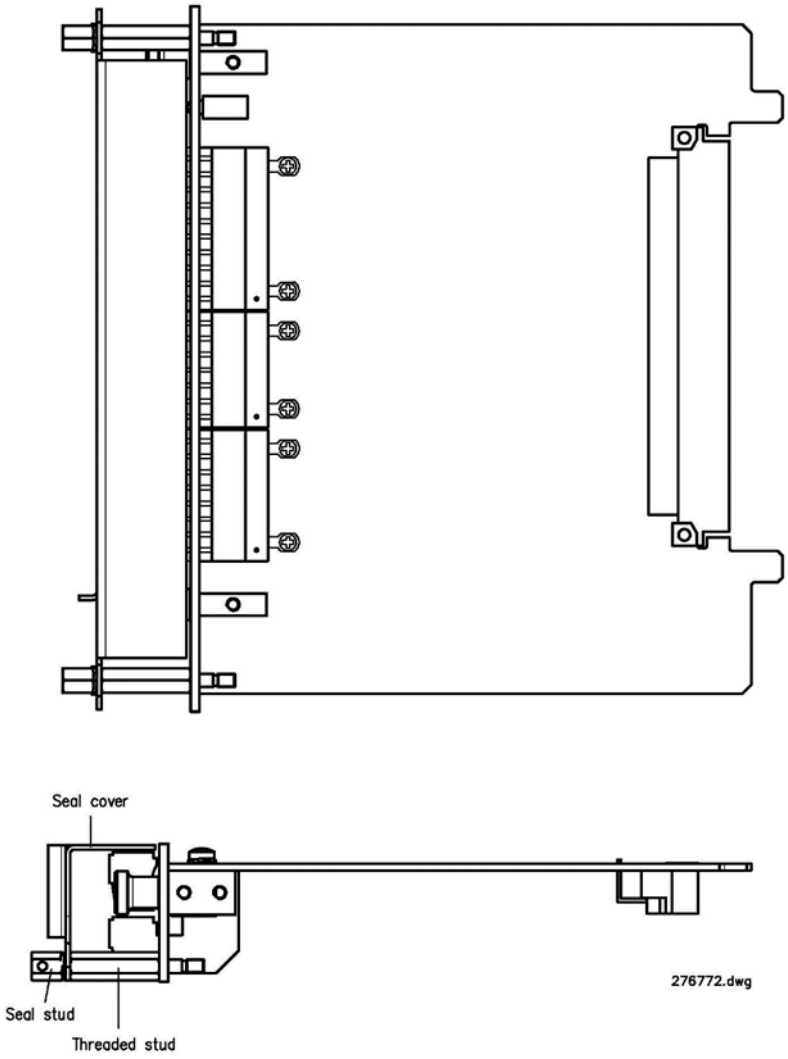
### Order details

| Designation | Order number |
|---|---|
| 3/2K-interface dual Ex i type 6932-105 | 276772 |

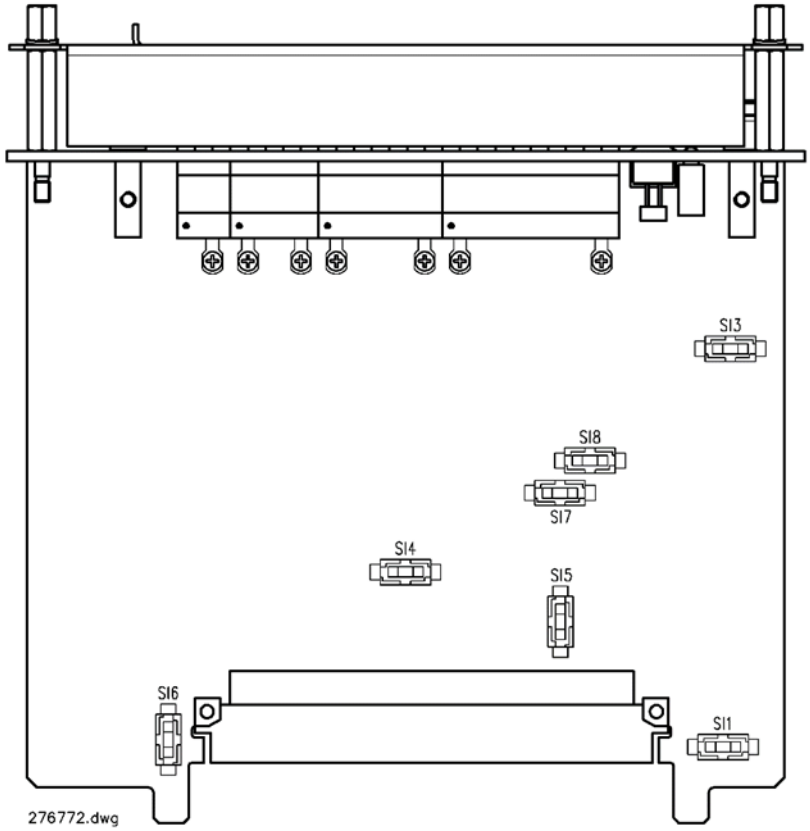
## 6.10.2 Safety instructions

- The 3/2K-interface dual Ex i must be built outside of the hazardous area. Note: For operation within the hazardous area the 3/2K-interface dual Ex i can be installed in a flameproof enclosure according to EN 60079-1
- (flameproof enclosure "d"), which must be considered separately for this purpose.
- The 3/2K-interface dual Ex i must be mounted in a housing with at least one degree of protection of IP 20 according to EN 60529.
- The 3/2K-interface dual Ex i is suitable for use in a temperature range of -20 °C to + 70 °C at the installation point.
- The installation of the 3/2K-interface dual Ex i must be done so that the clearance of bare parts of intrinsically-safe circuits vis-a-vis metallic enclosure parts is at least 1.5 and vis-a-vis bare parts of non-intrinsically safe circuits is at least 4 mm and that the creepage distances of bare parts of intrinsically-safe circuits vis-a-vis bare parts of non-intrinsically safe circuits is at least 4 mm.
- The connectors for the external intrinsically safe circuits must be separated from the connectors of not intrinsically safe circuits in accordance to paragraph 6.2.1 of EN 60079-11:2007.

## Mechanical sealing of measuring points with seal

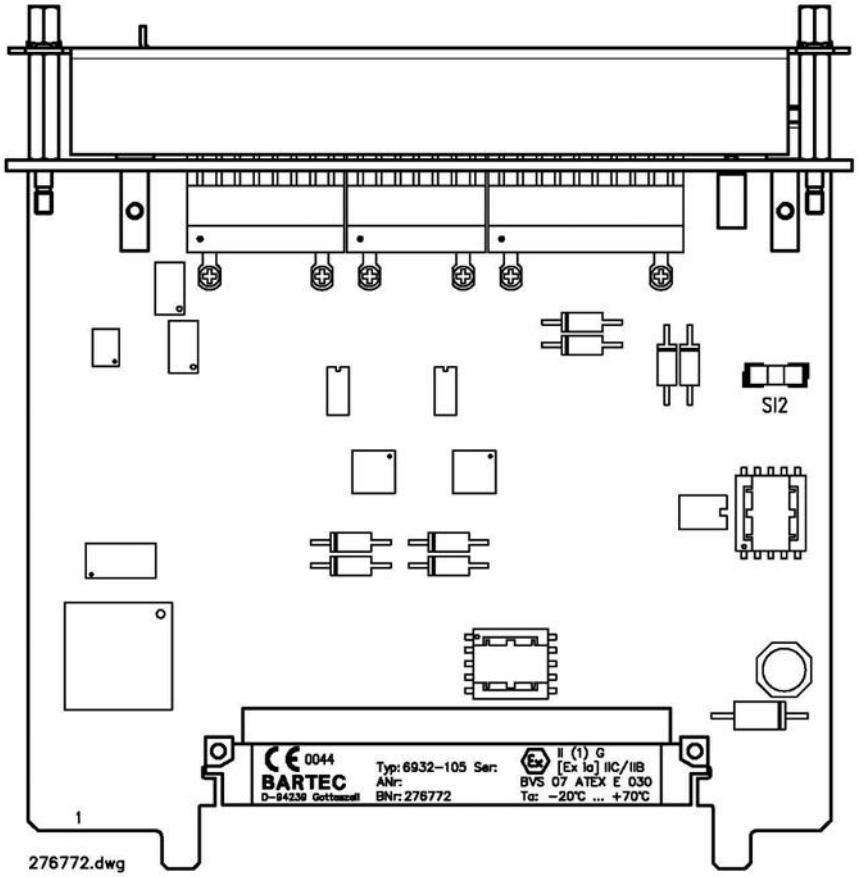


## 6.10.3 Fuse values up to series A




| Sicherung | Beschreibung | Wert | BNr. |
|---|---|---|---|
| SI1 | Zuführung Sensorik (24V) | F 1.0A | 281772 |
| SI3 | 12V Sensorik | F 125mA | 281770 |
| SI4 | 24V HART | F 63mA | 281769 |
| SI5 | Modulation HART | F 63mA | 281769 |
| SI6 | CPU | F 250mA | 281771 |
| SI7 | +5V Sensorik | F 125mA | 281770 |
| SI8 | +8.2V Sensorik | F 125mA | 281770 |

## 6.10.4 Fuse values from series B

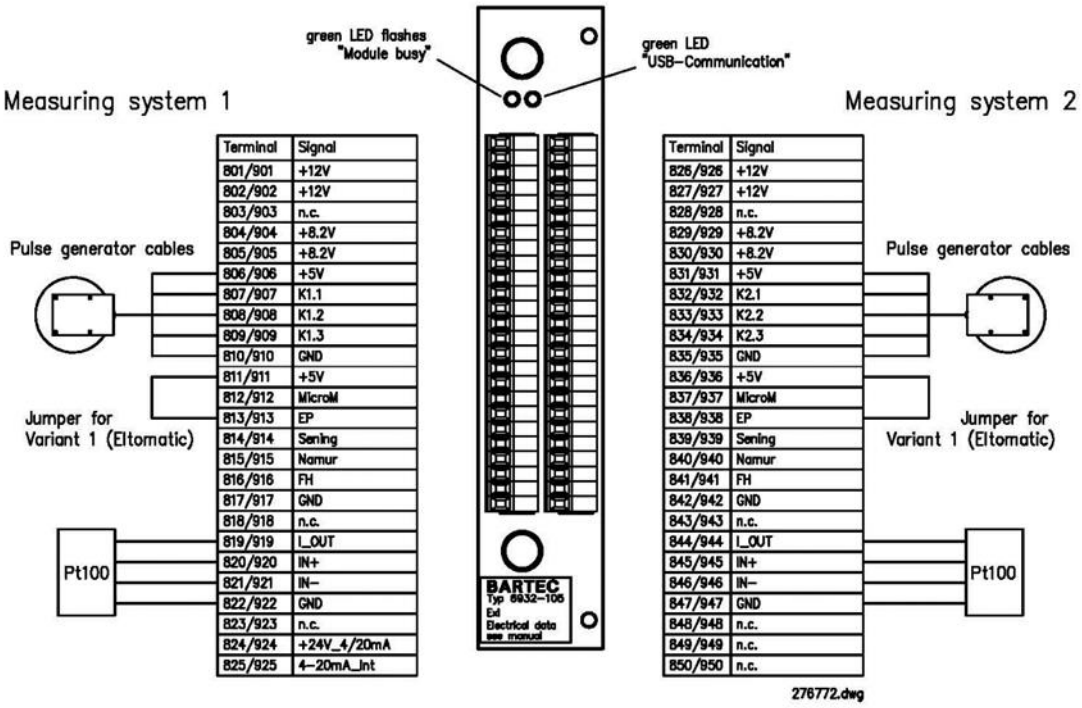



| Fuse | Description | Value | Order No. |
|---|---|---|---|
| SI2 | 12V Sensor system | T 125mA | 292349 |

## 6.10.5 Variant 1 - Open Collector

- Bartec pulse generator Ex type 6716-5x/6x
- Satam pulse generator AC30
- Turbine 1000L / DN50 type 6907-20
- Turbine 4000L / DN100 type 6907-22
- Bartec pulse generator Ex, 3-channel type 6716-94

| WARNING! | |
|---|---|
| ⚠ | Before installation and operation in hazardous areas, and before connecting to the BARTEC system, the respective Ex approval of the foreign de-vice must be checked. |




| Terminal | Signal |
|---|---|
| 801/901 | +12V |
| 802/902 | +12V |
| 803/903 | n.c. |
| 804/904 | +8.2V |
| 805/905 | +8.2V |
| 806/906 | +5V |
| 807/907 | K1.1 |
| 808/908 | K1.2 |
| 809/909 | K1.3 |
| 810/910 | GND |
| 811/911 | +5V |
| 812/912 | MicroM |
| 813/913 | EP |
| 814/914 | Sening |
| 815/915 | Namur |
| 816/916 | FH |
| 817/917 | GND |
| 818/918 | n.c. |
| 819/919 | I_OUT |
| 820/920 | IN+ |
| 821/921 | IN- |
| 822/922 | GND |
| 823/923 | n.c. |
| 824/924 | +24V_4/20mA |
| 825/925 | 4-20mA_Int |

| Terminal | Signal |
|---|---|
| 826/926 | +12V |
| 827/927 | +12V |
| 828/928 | n.c. |
| 829/929 | +8.2V |
| 830/930 | +8.2V |
| 831/931 | +5V |
| 832/932 | K2.1 |
| 833/933 | K2.2 |
| 834/934 | K2.3 |
| 835/935 | GND |
| 836/936 | +5V |
| 837/937 | MicroM |
| 838/938 | EP |
| 839/939 | Sening |
| 840/940 | Namur |
| 841/941 | FH |
| 842/942 | GND |
| 843/943 | n.c. |
| 844/944 | I_OUT |
| 845/945 | IN+ |
| 846/946 | IN- |
| 847/947 | GND |
| 848/948 | n.c. |
| 849/949 | n.c. |
| 850/950 | n.c. |

### 6.10.5.1 Connections for two-channel-operation with Open Collector

- Satam pulse generator AC30

(SW-parameter: 2-channel, Open Collector)

| Pulse generator measuring system 1 | |
|---|---|
| Terminal | Satam AC30 |
| x06 (+5V) | +5V (RD) |
| x07 (K1.1) | K1 (YE) |
| x08 (K1.2) | K2 (WH) |
| x10 (GND) | 0V (BK) |
| shield bar | Shield |
| Terminal | Variant 1 |
| x11 (+5V) | Set function jumper |
| x13 (EP) | |

### 6.10.5.2 Connections for three-channel-operation with Open Collector

- Bartec pulse generator Ex type 6716-5x/-6x
- Bartec Turbine type 6907-20/-22
- Bartec pulse generator Ex, 3-channel type 6716-94

Rotation "backward"

(SW-parameter: 3-channel, open collector, backward)

| Pulse generator measuring system 1 | | Pulse generator measuring system 2 | |
|---|---|---|---|
| Terminal | Bartec | Terminal | Bartec |
| x06 (+5V) | +5V (GN) | x31 (+5V) | +5V (GN) |
| x07 (K1.1) | K1 (WH) | x32 (K2.1) | K1 (WH) |
| x08 (K1.2) | K2 (YE) | x33 (K2.2) | K2 (YE) |
| x09 (K1.3) | K3 (GR) | x34 (K2.3) | K3 (GR) |
| x10 (GND) | 0V (BN) | x35 (GND) | 0V (BN) |
| shield bar | shield | shield bar | Shield |
| Terminal | Variant 1 | Terminal | Variant 1 |
| x11 (+5V) | Set function jumper | x36 (+5V) | Set function jumper |
| x13 (EP) | | x38 (EP) | |

Rotation “forward”

(SW-parameter: 3-channel, open collector, forward)

| Pulse generator measuring system 1 | | Pulse generator measuring system 2 | |
|---|---|---|---|
| Terminal | Bartec | Terminal | Bartec |
| x06 (+5V) | +5V (GN) | x31 (+5V) | +5V (GN) |
| x07 (K1.1) | K1 (YE) | x32 (K2.1) | K1 (YE) |
| x08 (K1.2) | K2 (WH) | x33 (K2.2) | K2 (WH) |
| x09 (K1.3) | K3 (GR) | x34 (K2.3) | K3 (GR) |
| x10 (GND) | 0V (BN) | x35 (GND) | 0V (BN) |
| shield bar | shield | shield bar | Shield |
| Terminal | Variant 1 | Terminal | Variant 1 |
| x11 (+5V) | Set function jumper | x36 (+5V) | Set function jumper |
| x13 (EP) | | x38 (EP) | |

| **WARNING!** | |
|---|---|
|  | The cable lengths of BARTEC pulser series type 6716/-5x/-6x/-94 is 5m.<br>Fit the shield on the shield bar.<br>An extension of the cable is not permitted. |

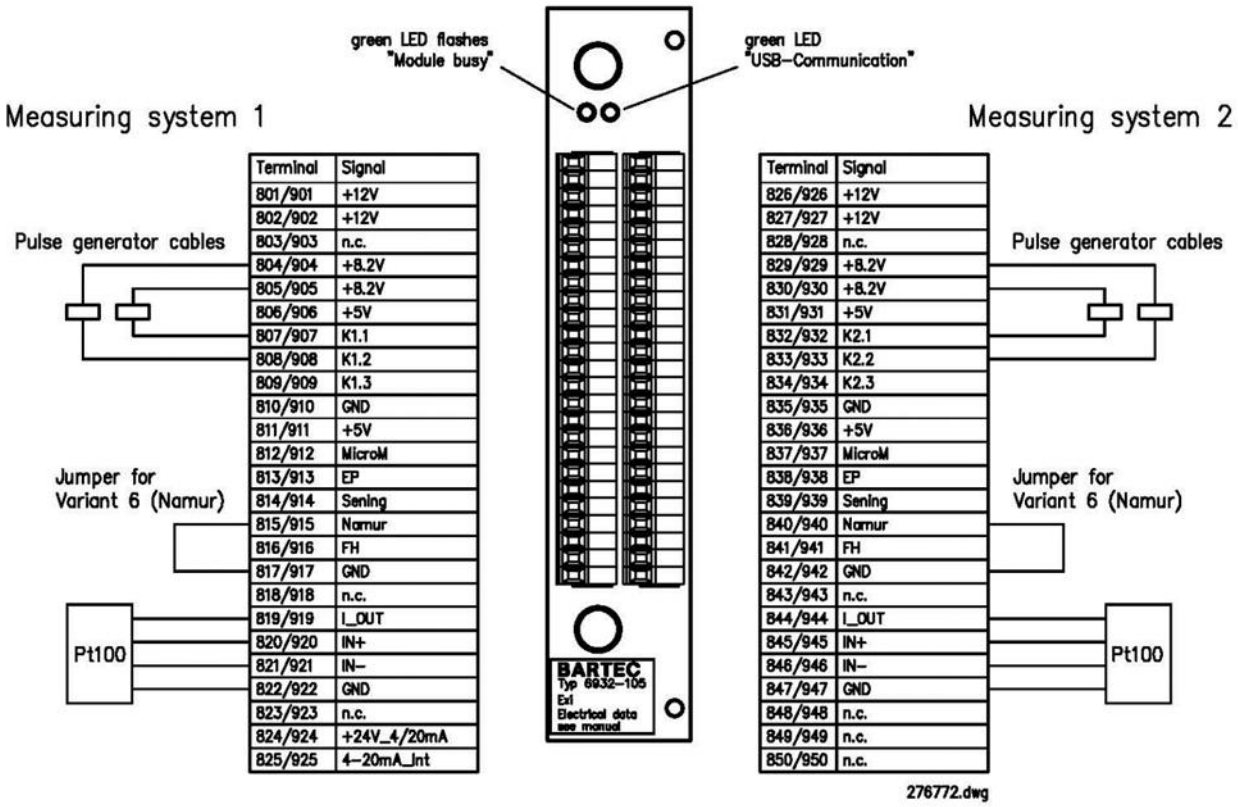
### 6.10.5.3 Connections for PT100 4-wire (type 6702-31)

| Pulse generator measuring system 1 | | Pulse generator measuring system 2 | |
|---|---|---|---|
| Terminal | PT100 | Terminal | PT100 |
| x19 (I_OUT) | Or | x44 (I_OUT) | Or |
| x20 (IN+) | Bk | x45 (IN+) | Bk |
| x21 (IN-) | Rd | x46 (IN-) | Rd |
| x22 (GND) | bn | x47 (GND) | bn |
| shield bar | ye-gn | shield bar | ye-gn |

## 6.10.6 Variant 6 - Namur

- Alfons Haar IGELZ
- Faure Herman TLM

| WARNING! | |
|---|---|
| ⚠ | Before installation and operation in hazardous areas, and before connecting to the BARTEC system, the respective Ex approval of the foreign de-vice must be checked. |




| Terminal | Signal |
|---|---|
| 801/901 | +12V |
| 802/902 | +12V |
| 803/903 | n.c. |
| 804/904 | +8.2V |
| 805/905 | +8.2V |
| 806/906 | +5V |
| 807/907 | K1.1 |
| 808/908 | K1.2 |
| 809/909 | K1.3 |
| 810/910 | GND |
| 811/911 | +5V |
| 812/912 | MicroM |
| 813/913 | EP |
| 814/914 | Sening |
| 815/915 | Namur |
| 816/916 | FH |
| 817/917 | GND |
| 818/918 | n.c. |
| 819/919 | I_OUT |
| 820/920 | IN+ |
| 821/921 | IN– |
| 822/922 | GND |
| 823/923 | n.c. |
| 824/924 | +24V_4/20mA |
| 825/925 | 4–20mA_Int |

| Terminal | Signal |
|---|---|
| 826/926 | +12V |
| 827/927 | +12V |
| 828/928 | n.c. |
| 829/929 | +8.2V |
| 830/930 | +8.2V |
| 831/931 | +5V |
| 832/932 | K2.1 |
| 833/933 | K2.2 |
| 834/934 | K2.3 |
| 835/935 | GND |
| 836/936 | +5V |
| 837/937 | MicroM |
| 838/938 | EP |
| 839/939 | Sening |
| 840/940 | Namur |
| 841/941 | FH |
| 842/942 | GND |
| 843/943 | n.c. |
| 844/944 | I_OUT |
| 845/945 | IN+ |
| 846/946 | IN– |
| 847/947 | GND |
| 848/948 | n.c. |
| 849/949 | n.c. |
| 850/950 | n.c. |

### 6.10.6.1 Connections for two-channel-operation with NAMUR

(SW-parameter: 2-channel, Namur)

| Pulse generator measuring system 1 | | Pulse generator measuring system 2 | |
|---|---|---|---|
| Terminal | Generator I | Terminal | Generator I |
| x04 (+8,2 V) | + | x29 (+8,2 V) | + |
| x08 (K1.2) | - | x33 (K2.2) | - |
| shield bar | shield | shield bar | Shield |
| Terminal | Generator II (90° offset) | Terminal | Generator II (90° offset) |
| x05 (+8,2 V) | + | x30 (+8,2 V) | + |
| x07 (K1.1) | - | x32 (K2.1) | - |
| shield bar | shield | shield bar | Shield |
| Terminal | Variant 6 | Terminal | Variant 6 |
| x15 (Namur) | Set function | x40 (Namur) | Set function |
| x17 (GND) | jumper | x42 (GND) | jumper |

**WARNING!**

Generally at all generator types the shield must be fitted or it must always be used a shielded cable.

### 6.10.6.2 Connections for PT100 4-wire (type 6702-31)

| PT100 Pulse generator measuring system 1 | | Pulse generator measuring system 2 | |
|---|---|---|---|
| Terminal | PT100 | Terminal | PT100 |
| x19 (I_OUT) | Or | x44 (I_OUT) | Or |
| x20 (IN+) | Bk | x45 (IN+) | Bk |
| x21 (IN-) | Rd | x46 (IN-) | Rd |
| x22 (GND) | Bn | x47 (GND) | Bn |
| shield bar | Ye-gn | shield bar | Ye-gn |

## 6.10.7 Variant 2 - Power without monitoring

| WARNING! | |
|---|---|
|  | Before installation and operation in hazardous areas, and before connecting to the BARTEC system, the respective Ex approval of the foreign device must be checked. |

### 6.10.7.1 Connections for two-channel-operation power without monitoring

(SW-parameter: 2-channel, power without monitoring)

| Pulse generator measuring system 1 | |
|---|---|
| Terminal | Variant 2 |
| x16 (FH) | Set function jumper |
| x17 (GND) | |

| WARNING! | |
|---|---|
|  | This version supports special measuring sensors with associated generator type. This variant is not released. |

## 6.10.8 Variant 3 - Power with monitoring

| WARNING! | |
|---|---|
|  | Before installation and operation in hazardous areas, and before connecting to the BARTEC system, the respective Ex approval of the foreign de-vice must be checked. |

### 6.10.8.1 Connections for two-channel-operation power with monitoring

(SW-parameter: 2-channel, Power with monitoring)

| Pulse generator measuring system 1 | |
|---|---|
| Terminal | Variant 2 |
| x14 (Sening) | Set function jumper |
| x17 (GND) | |

| WARNING! | |
|---|---|
|  | This version supports special measuring sensors with associated generator type. This variant is not released. |

### 6.10.9 Variant 4 - Promass 64

- Endress + Hauser Promass 64

| WARNING! | |
|---|---|
|  | Before installation and operation in hazardous areas, and before connecting to the BARTEC system, the respective Ex approval of the foreign de-vice must be checked. |

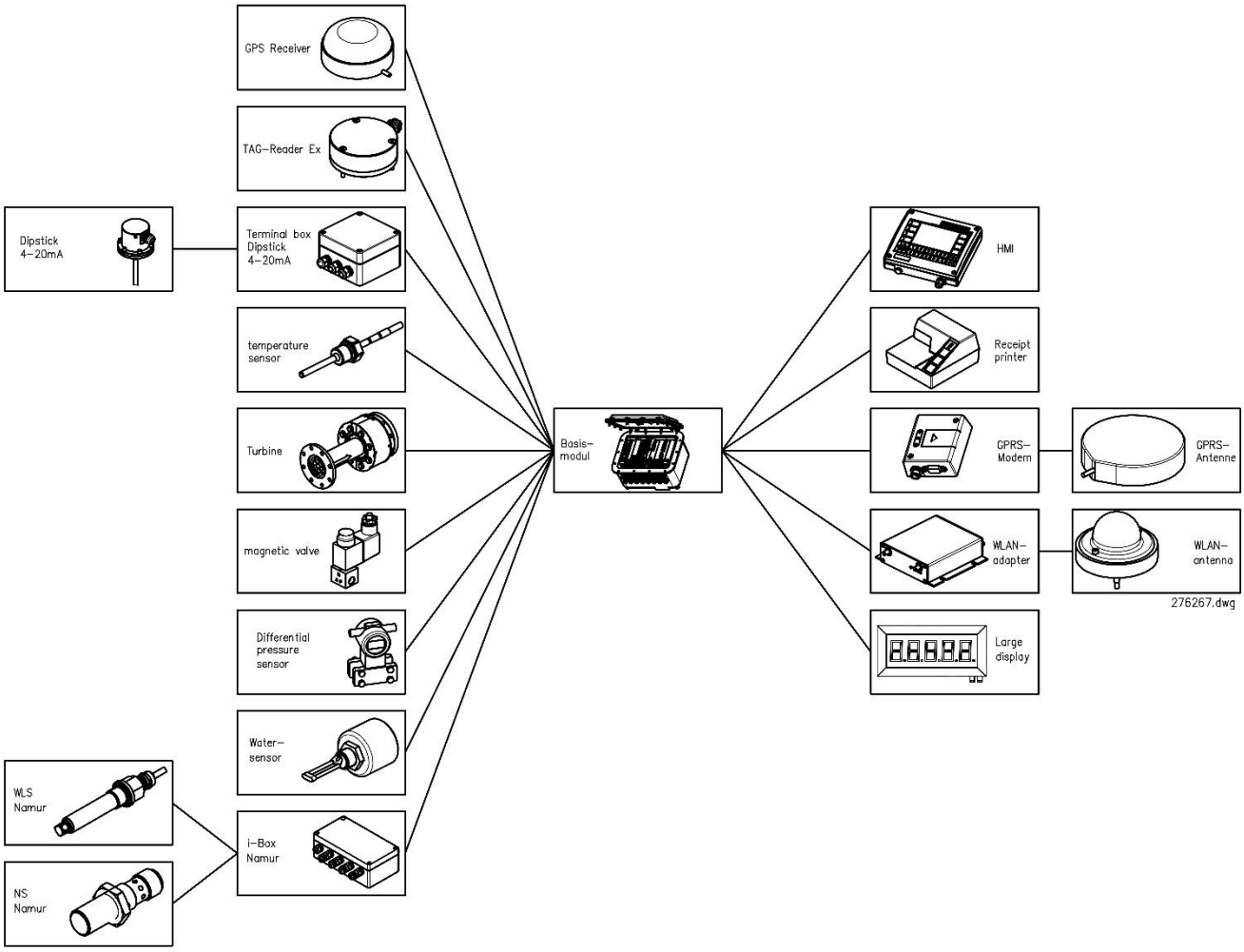
#### 6.10.9.1 Connections for two-channel-operation with Promass 64

(SW-parameter: 2-channel, Promass 64)

| Pulse generator measuring system 1 | |
|---|---|
| Terminal | Variant 2 |
| x11 (+5V) | Set function jumper |
| x13 (EP) | |

| WARNING! | |
|---|---|
|  | This version supports the measuring sensor Promass 64 with integrated pulse generator of Endress + Hauser. This variant is not released. |

# 7 Periphery




## 7.1 Display and operating unit Ex i type 6922-10


Handling „fingers only“

## 7.1.1 Technical data

### Equipment-specific Data

| | |
|---|---|
| Keyboard | Touch screen |
| Display | LCD graphics cable, backlit, 120 x 89 mm<br>Visual field, 320 x 240 dot transflective |
| Line of vision | 6 o'clock |
| Viewing angle | Addition viewing angle: back 12:00 o'clock - front 6:00 o'clock<br>R - F = 90° type. |
| Backlighting | LED colour: white |

### Electrical Data

| | |
|---|---|
| Supply circuit "U_E" and data interface "T" | Ex ib IIB<br>Nominal voltage DC 5 V, nominal power consumption 165 mA<br>Ui ≈ 6V, Ii ≈ 500 mA, Pi ≈ 1.1 W, Ci ≈ 80 µF, Li ≈ 0 µH |
| Data interface "R" | Ex ib IIB<br>Ui ≈ 6 V, Ii ≈ 500 mA, Pi ≈ 3 W, Ci ≈ 0.1 µF, Li ≈ 0 µH,<br>Uo ≈ 6.0 V, Io ≈ 80 mA, Po ≈ 0.12 W, R ≈ 75 Ω<br>Linear characteristic line, Co ≈ 1 µF, Lo ≈ 50 µH |
| Illumination circuit "UB" | Ex ib IIB<br>Nominal voltage DC 5 V, nominal current consumption 180 mA<br>Ui ≈ 6 V, Uq ≈ 10 V, Rq ≈ 16.6 Ω, Ii ≈ 0.6 A, Is ≈ 0.425 A,<br>Pi ≈ 1.5W, Ci ≈ 6 µF, Li ≈ 0 µH |
| Shielded connection X | Maximum internal capacitance vis-à-vis housing: Ci ≈ 11 nF |
| Connection type | 10 m continuous; slot 7xx |

### Ambient Conditions

| | |
|---|---|
| Operating temperature | - 20 … + 50 °C |
| Storage temperature | - 30 … + 60 °C |
| Protection type | IP 65 per EN 60529 |
| Climate class | ISF per DIN 40040 |
| Equipment group/category<br>Ignition-protection type | II 2 G Ex ib IIB T4 |
| EC-type examination certificate | BVS 05 ATEX E 122 |
| Standards | EN 60079-0, EN 60079-11 |

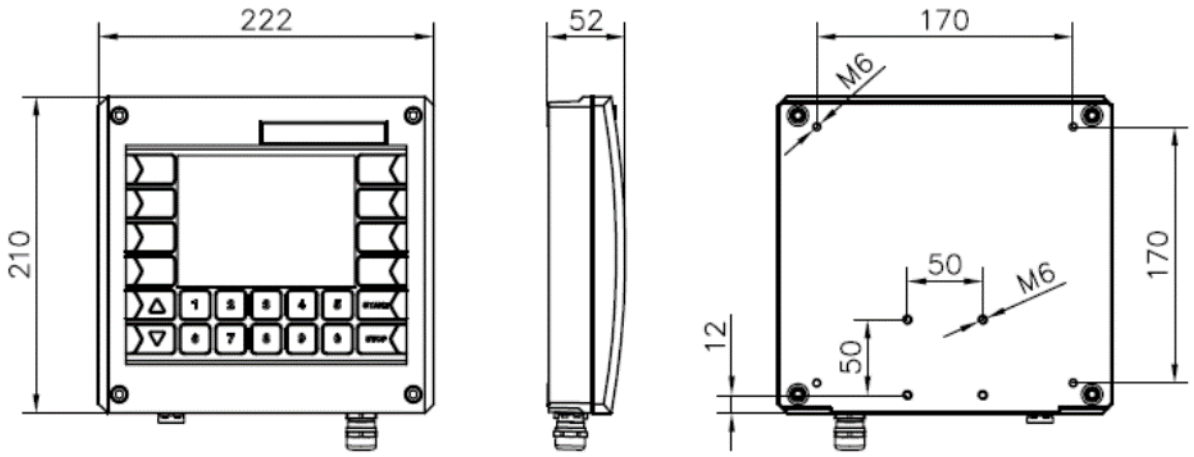
### Mechanical data

| | |
|---|---|
| Dimensions | W x H x D: 210 x 222 x 52 mm |
| Material | Alu die casing, painted blue |
| Weight | 25 N |

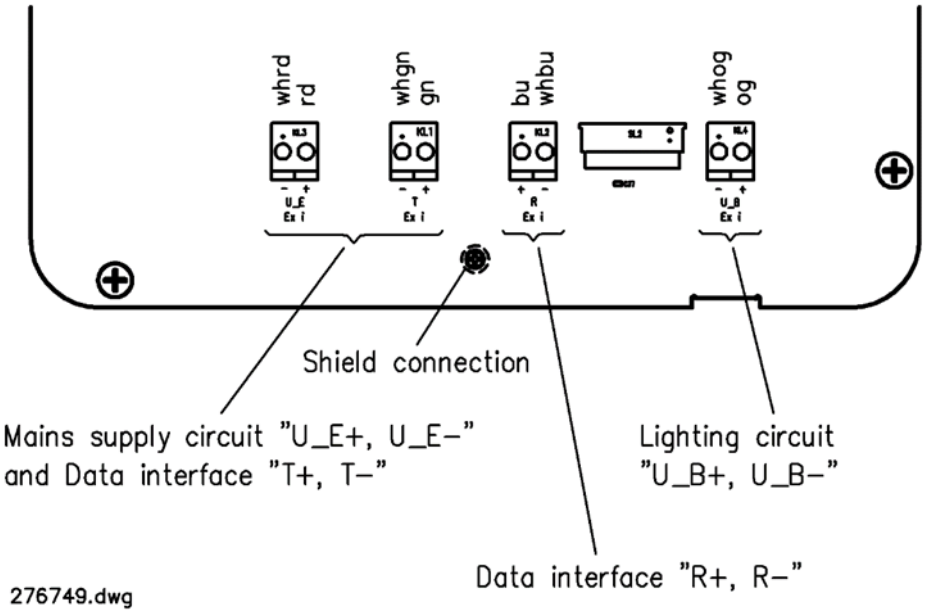
### Order details

| Designation | Order number |
|---|---|
| Display and control unit Ex i type 6922-10 | 276749 |

## 7.1.2 Dimensions and mounting



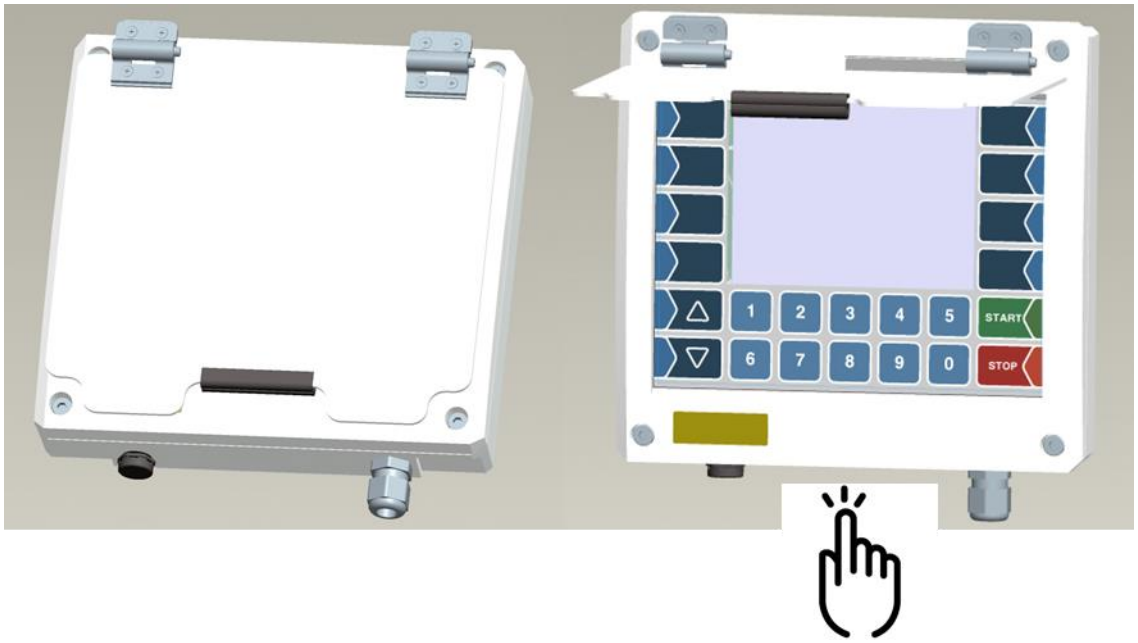

## 7.1.3 Terminal Assignment




Please mount the display and operating unit on shaded position!

## 7.2 Display and operating unit Ex i-sun protected type 6922-10

To protect against direct sunlight the display and operating unit Ex i has an optional sun protection.



Handling „fingers only“.

## 7.2.1 Technical data

### Equipment-specific Data

| | |
|---|---|
| Keyboard | Touch screen |
| Display | LCD graphics cable, backlit, 120 x 89 mm<br>Visual field, 320 x 240 dot transflective |
| Line of vision | 6 o'clock |
| Viewing angle | Addition viewing angle: back 12:00 o'clock - front 6:00 o'clock R - F = 90° type. |
| Backlighting | LED colour: white |

### Electrical Data

| | |
|---|---|
| Supply circuit "U_E" and data interface "T" | Ex ib IIB<br>Nominal voltage DC 5 V, nominal power consumption<br>165 mA<br>Ui ≈ 6V, Ii ≈ 500 mA, Pi ≈ 1.1 W, Ci ≈ 80 µF, Li ≈ 0 µH |
| Data interface "R" | Ex ib IIB<br>Ui ≈ 6 V, Ii ≈ 500 mA, Pi ≈ 3 W, Ci ≈ 0.1 µF, Li ≈ 0 µH,<br>Uo ≈ 6.0 V, Io ≈ 80 mA, Po ≈ 0.12 W, R ≈ 75 Ω<br>Linear characteristic line, Co ≈ 1 µF, Lo ≈ 50 µH |
| Illumination circuit "UB" | Ex ib IIB<br>Nominal voltage DC 5 V, nominal current consumption<br>180 mA<br>Ui ≈ 6 V, Uq ≈ 10 V, Rq ≈ 16.6 Ω, Ii ≈ 0.6 A, Is ≈ 0.425 A,<br>Pi ≈ 1.5W, Ci ≈ 6 µF, Li ≈ 0 µH |
| Shielded connection X | Maximum internal capacitance vis-à-vis housing:<br>Ci ≈ 11 nF |
| Connection type | 10 m continuous; slot 7xx |

### Ambient Conditions

| | |
|---|---|
| Operating temperature | - 20 … + 50 °C |
| Storage temperature | - 30 … + 60 °C |
| Protection type | IP 65 per EN 60529 |
| Climate class | ISF per DIN 40040 |
| Equipment group/category<br>Ignition-protection type | II 2 G Ex ib IIB T4 |
| EC-type examination certificate | BVS 05 ATEX E 122 |
| Standards | EN 60079-0, EN 60079-11 |

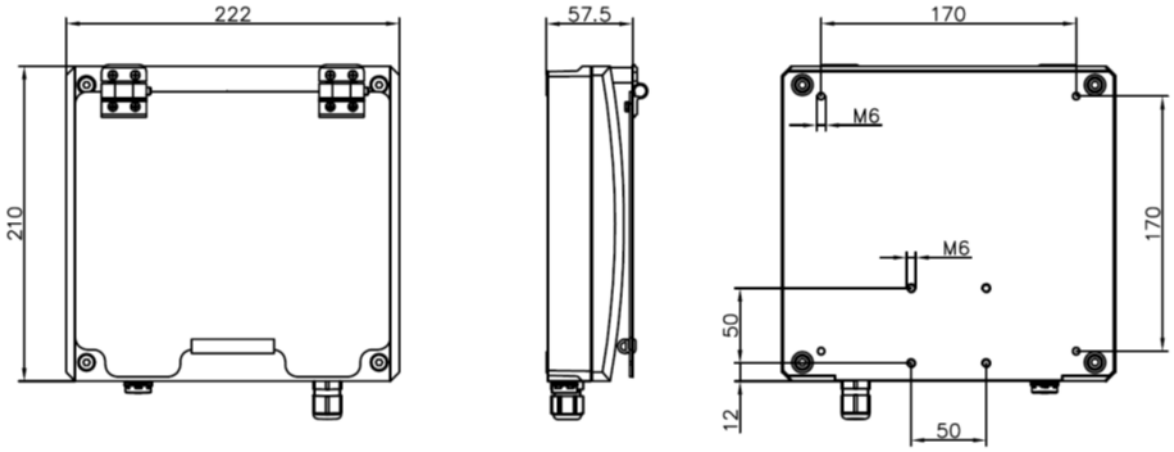
### Mechanical data

| | |
|---|---|
| Dimensions | W x H x D: 210 x 222 x 52 mm |
| Material | Alu die casting, painted blue |
| Weight | 25 N |

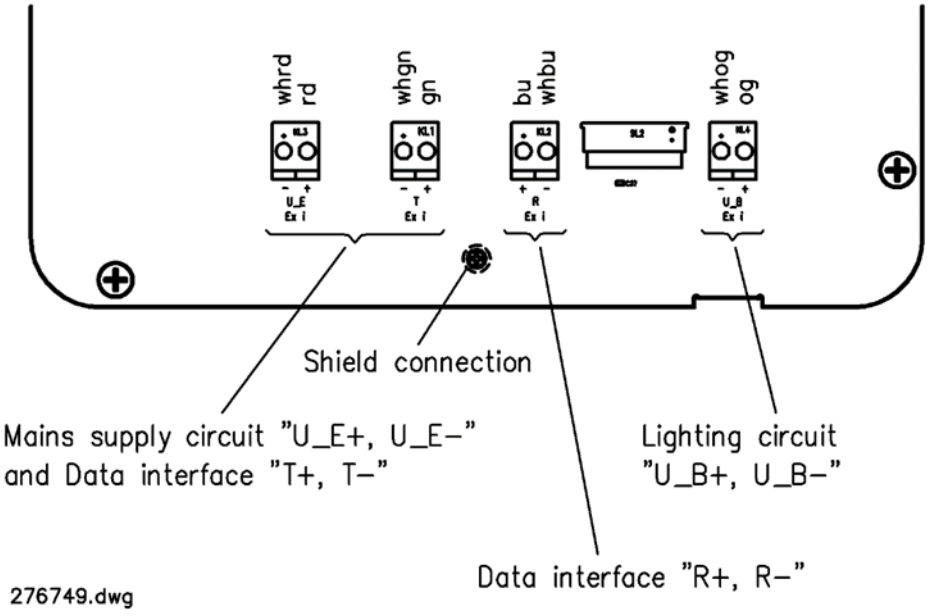
### Order details

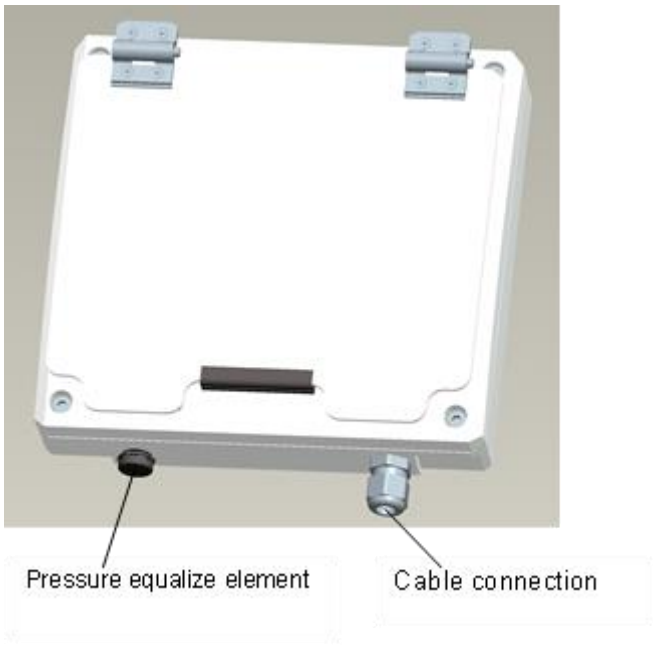
| Designation | Order number |
|---|---|
| Display and control unit Ex i sun protected type 6922-10 | 388393 |

## 7.2.2 Dimensions and mounting




## 7.2.3 Terminal connections






Please mount the display and operating unit on shaded position!
Please pay attention to a particularly careful installation of the cable!

## 7.3 Display and operating unit Ex i Bluetooth type 6922-11


Handling „fingers only“

## 7.3.1 Technical data

### Equipment-specific Data

| | |
|---|---|
| Keyboard | Touch screen |
| Display | LCD graphics cable, backlit, 120 x 89 mm<br>Visual field, 320 x 240 dot transflective |
| Line of vision | 6 o'clock |
| Viewing angle | Additional viewing angle: back 12:00 o'clock - front 6:00 o'clock<br>R - F = 90° type. |
| Backlighting | LED colour: white |
| Bluetooth | Class 2; max. range 5 m; slot 6xx |
| Calibration memory | EEPROM 64 Kbyte; 57600 Baud; slot 6xx |

### Electrical Data

| | |
|---|---|
| Supply circuit "U_E" and data interface "T" | Ex ib IIB<br>Nominal voltage DC 5 V, nominal current consumption 165 mA<br>Ui ≈ 6V, Ii ≈ 500 mA, Pi ≈ 1.1 W, Ci ≈ 80 µF, Li ≈ 0 µH |
| Data interface "R" | Ex ib IIB<br>Ui ≈ 6 V, Ii ≈ 500 mA, Pi ≈ 3 W, Ci ≈ 0.1 µF, Li ≈ 0 µH,<br>Uo ≈ 6.0 V, Io ≈ 80 mA, Po ≈ 0.12 W, R ≈ 75 Ω<br>Linear characteristic line, Co ≈ 1 µF, Lo ≈ 50 µH |
| Illumination circuit "UB" | Ex ib IIB<br>Nominal voltage DC 5 V, nominal current consumption 180 mA<br>Ui ≈ 6 V, Uq ≈ 10 V, Rq ≈ 16.6 Ω, Ii ≈ 0.6 A, Is ≈ 0.425 A,<br>Pi ≈ 1.5W, Ci ≈ 6 µF, Li ≈ 0 µH |
| Bluetooth® radio transmission | Frequency 2.4 GHz, typ. transmission output 0dBm (1 mW), max. emitted output 3 dBm (2mW) < 100 mW |
| Shielded connection X | Maximum internal capacitance vis-à-vis housing: Ci ≈ 11 nF |
| Connection type | 5 m continuous, slot 6xx |

### Ambient Conditions

| | |
|---|---|
| Operating temperature | - 20 … + 50 °C |
| Storage temperature | - 30 … + 60 °C |
| Protection type | IP 65 per EN 60529 |
| Climate class | ISF per DIN 40040 |
| Ignition-protection type | II 2 G Ex ib IIB T4 |
| EC-type examination certificate | BVS 05 ATEX E 122 |
| Standards | EN 60079-0, EN 60079-11 |

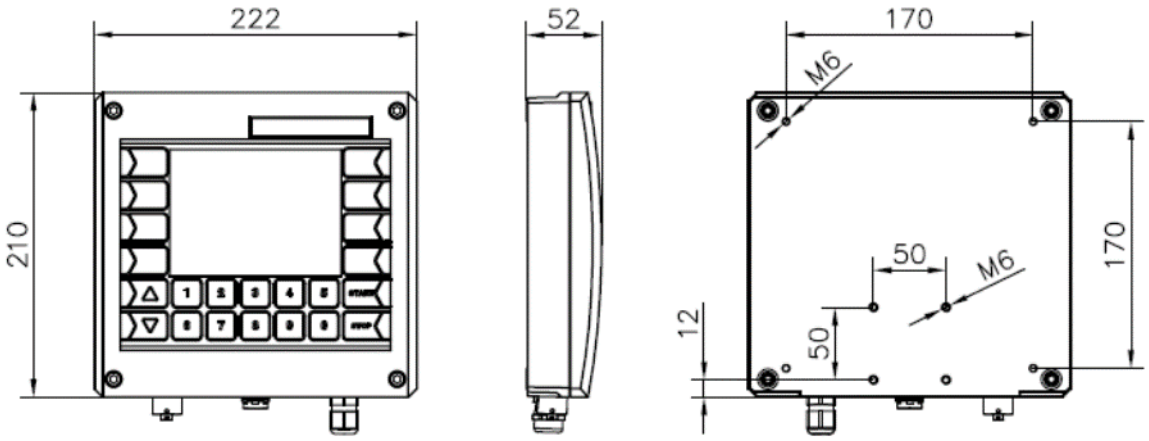
### Mechanical data

| | |
|---|---|
| Dimensions | W x H x D: 210 x 222 x 52 mm |
| Material | Alu die casing, painted blue |
| Weight | 25 N |

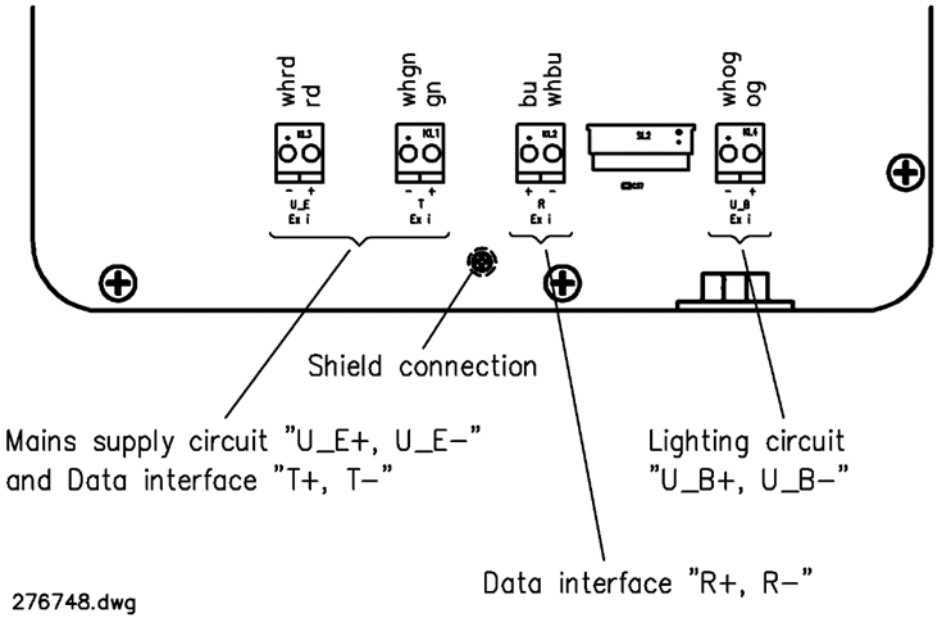
### Order details

| Designation | Order number |
|---|---|
| Display and control unit Ex i Bluetooth type 6922-11 | 276748 |

## 7.3.2 Dimensions and mounting




## 7.3.3 Terminal Assignment



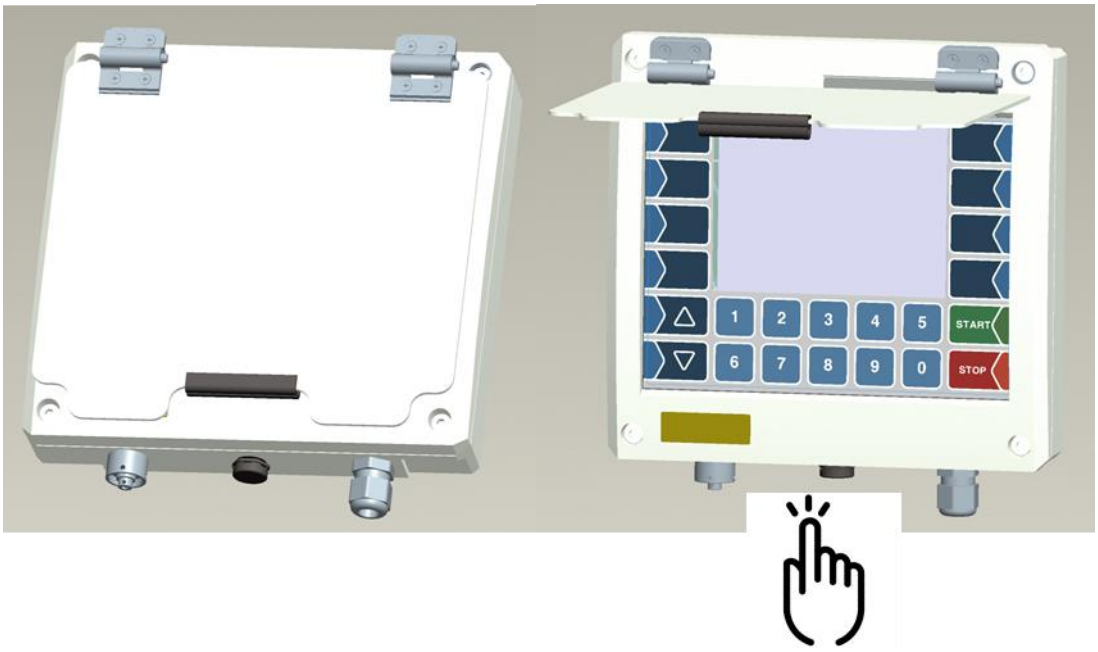

Before opening the display and operating unit type 6922-11 Ex i (Bluetooth), the seal switch must be opened first (pull out seal switch).

Please mount the display and operating unit on a shaded position!

Please pay attention to a particularly careful installation of the cable!

## 7.4 Display- and operating unit Ex i Bluetooth-sun protected type 6922-11

To protect against direct sunlight the display and operating unit Ex i Blue-tooth has an optional sun protection.




Handling „fingers only“

## 7.4.1 Technical data

### Equipment-specific Data

| | |
|---|---|
| Keyboard | Touch screen |
| Display | LCD graphics cable, backlit, 120 x 89 mm<br>Visual field, 320 x 240 dot transflective |
| Line of vision | 6 o'clock |
| Viewing angle | Additional viewing angle: back 12:00 o'clock - front 6:00 o'clock R - F = 90° type. |
| Backlighting | LED colour: white |
| Bluetooth | Class 2; max. range 5 m; slot 6xx |
| Calibration memory | EEPROM 64 Kbyte; 57600 Baud; slot 6xx |

### Electrical Data

| | |
|---|---|
| Supply circuit "U_E" and data interface "T" | Ex ib IIB<br>Nominal voltage DC 5 V, nominal current consumption 165 mA, Ui ≈ 6V, Ii ≈ 500 mA, Pi ≈ 1.1 W, Ci ≈ 80 µF, Li ≈ 0 µH |
| Data interface "R" | Ex ib IIB<br>Ui ≈ 6 V, Ii ≈ 500 mA, Pi ≈ 3 W, Ci ≈ 0.1 µF, Li ≈ 0 µH,<br>Uo ≈ 6.0 V, Io ≈ 80 mA, Po ≈ 0.12 W, R ≈ 75 Ω<br>Linear characteristic line, Co ≈ 1 µF, Lo ≈ 50 µH |
| Illumination circuit "UB" | Ex ib IIB<br>Nominal voltage DC 5 V, nominal current consumption<br>180 mA, Ui ≈ 6 V, Uq ≈ 10 V, Rq ≈ 16.6 Ω, Ii ≈ 0.6 A,<br>Is ≈ 0.425 A, Pi ≈ 1.5W, Ci ≈ 6 µF, Li ≈ 0 µH |
| Bluetooth® radio transmission | Frequency 2.4 GHz, typ. transmission output 0dBm (1 mW), max. emitted output 3 dBm (2mW) < 100 mW |
| Shielded connection X | Maximum internal capacitance vis-à-vis housing:<br>Ci ≈ 11 nF |
| Connection type | 5 m continuous, slot 6xx |

### Ambient Conditions

| | |
|---|---|
| Operating temperature | - 20 … + 50 °C |
| Storage temperature | - 30 … + 60 °C |
| Protection type | IP 65 per EN 60529 |
| Climate class | ISF per DIN 40040 |
| Ignition-protection type | II 2 G Ex ib IIB T4 |
| EC-type examination certificate | BVS 05 ATEX E 122 |
| Standards | EN 60079-0, EN 60079-11 |

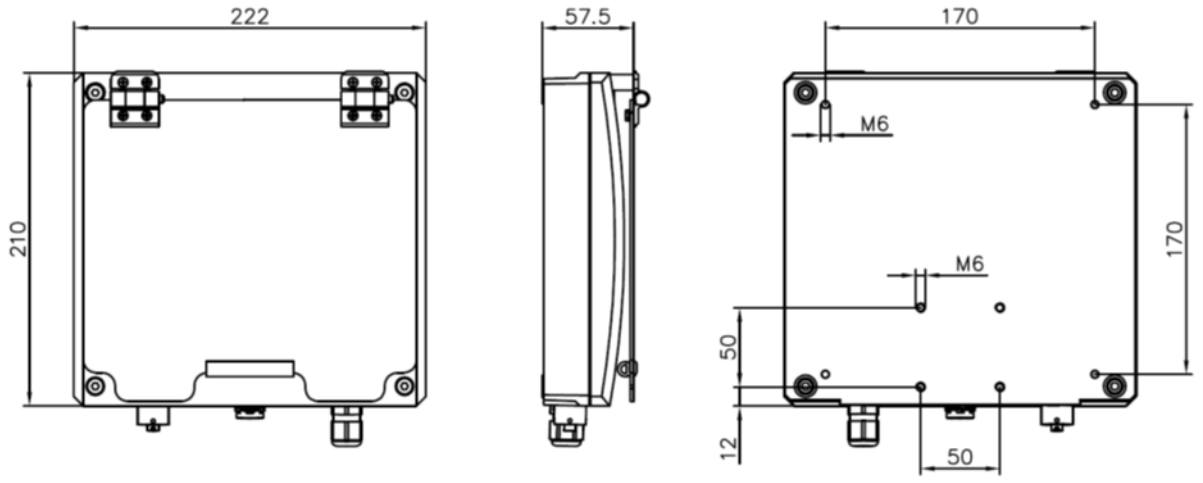
### Mechanical data

| | |
|---|---|
| Dimensions | W x H x D: 210 x 222 x 52 mm |
| Material | Alu die casting, painted blue |
| Weight | 25 N |

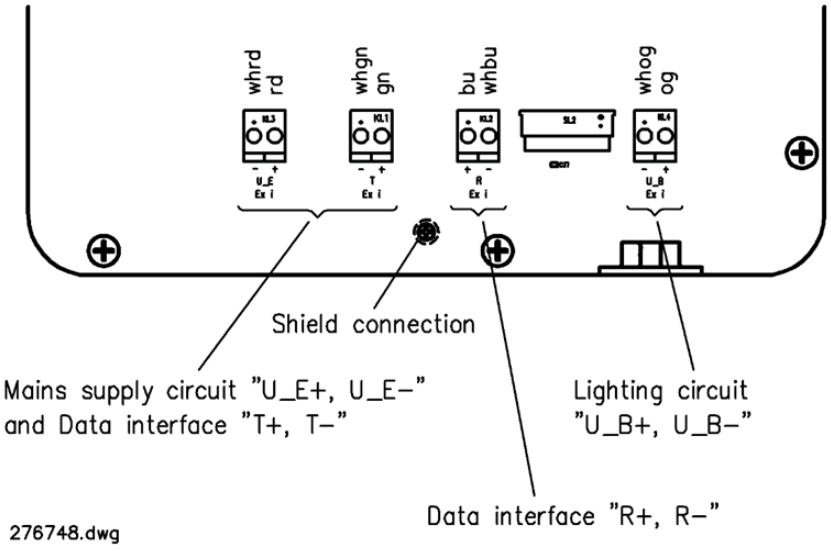
### Order details

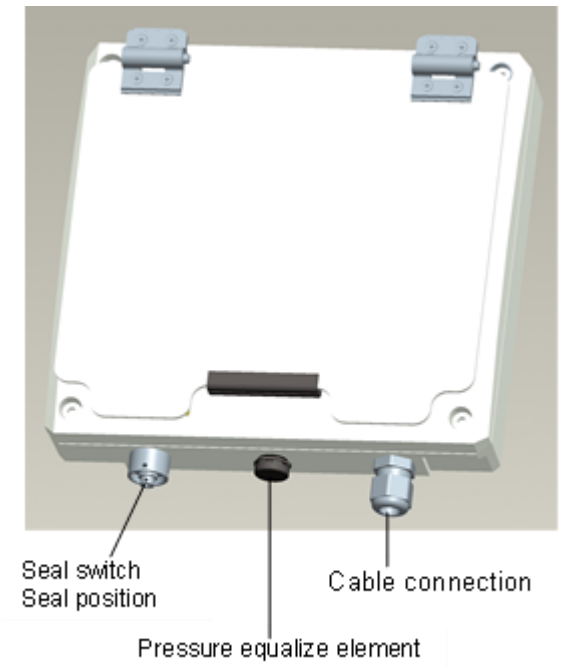
| Designation | Order number |
|---|---|
| Display and control unit Ex i Bluetooth, sun protection, type 6922-11 | 364150 |

## 7.4.2 Dimensions and mounting




## 7.4.3 Terminal connections






Before opening the display and operating unit type 6922-11 Ex i (Bluetooth), the seal switch must be opened first (pull out seal switch).

Please mount the display and operating unit on a shaded position!

Please pay attention to a particularly careful installation of the cable!

# 7.5 Solenoid valve, 3/2-way, A1, 24 V

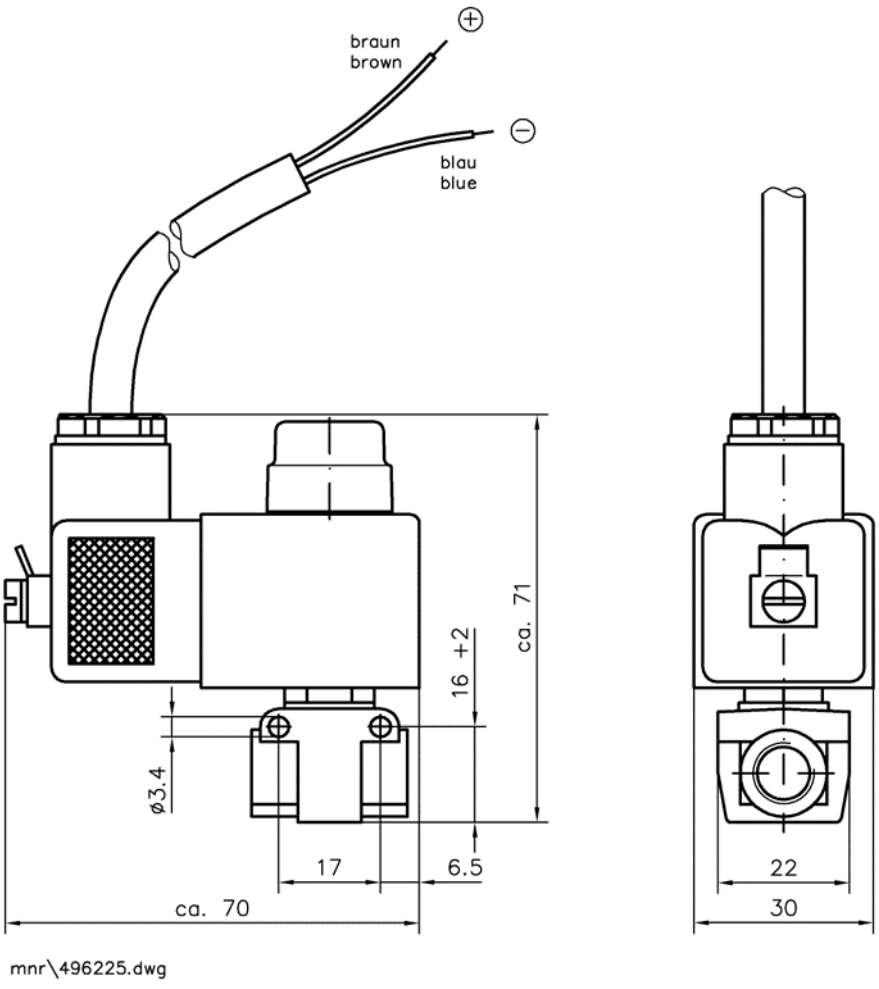
## 7.5.1 Technical data

| | |
|---|---|
| Pressure | 0 - 10 bar |
| Ambient temperature | -15…+50°C |
| Auxiliary power | DC 24 V ± 10 %, DC 0.14 A |
| Temperature of medium | Max. 50°C/h |
| Seal | FKM (Viton) |
| Equipment group / category / type of protection | II 2 G Ex mb II T5 |
| Certificates | PTB 03 ATEX 2018 X<br>IECEx PTB 04.0002 X |
| Norms | EN 60079-0, EN 60079-18<br>IEC 60079-0, IEC 60079-18 |
| Protection class (EN 60529) | IP 65 |

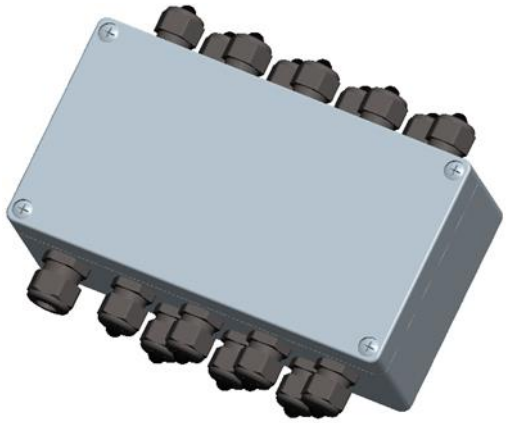
### Order details

| Designation | Order number |
|---|---|
| Solenoid valve, 3/2-way, A1, 24 V | U891496225 |

## 7.5.2 Dimensions and mounting



## 7.6 Terminal box 16x2 Ex e type 6982-11



### 7.6.1 Technical data

**Electrical Data**

| | |
|---|---|
| Connection type | 16 double series terminals with screw connection max. 1,5 mm²<br>4 ground terminals max. 1,5 mm²<br>16 cable glands ATEX M16x1,5 bk/wt<br>clamping range 5 … 10 m<br>1 cable gland ATEX M20x1,5 bk/wt<br>clamping range 6,5 … 12 mm |

**Ambient Conditions**

| | |
|---|---|
| Operating temperature | -20 … + 50 °C |
| Storage temperature | -20 … + 70 °C |
| Protection type | IP66 in accordance with DIN 40050 |
| Climatic class | JWF in accordance with DIN 40050 |

**Mechanical data**

| | |
|---|---|
| Weight | approx. 1,6 kg |
| Casing material | Aluminium |
| Equipment group/-category/<br>type of protection | II 2 G Ex e IIC T6 Gb |
| Certificate | PTB 00 ATEX 1063 |
| Standards | EN 60079-0, EN 60079-7 |
| Dimensions | 220 x 120 x 80 mm |

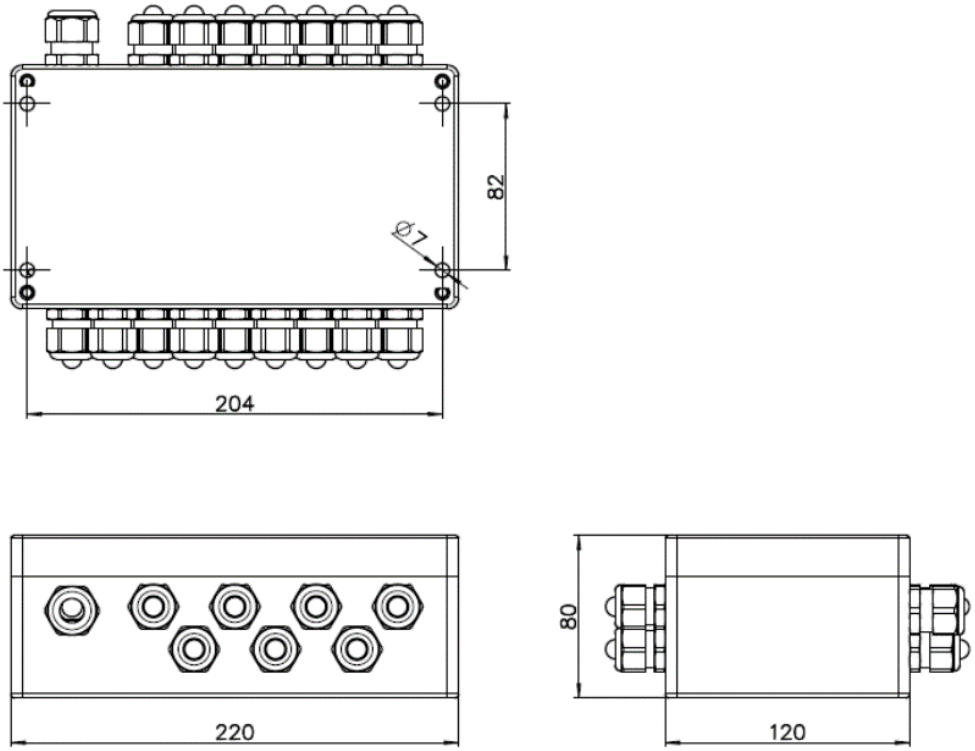
**Device-specific data**

| | |
|---|---|
| Nominal conditions | 23 ± 2 °C |
| Nominal voltage | 24 V DC |
| Nominal current max. | 11 A |

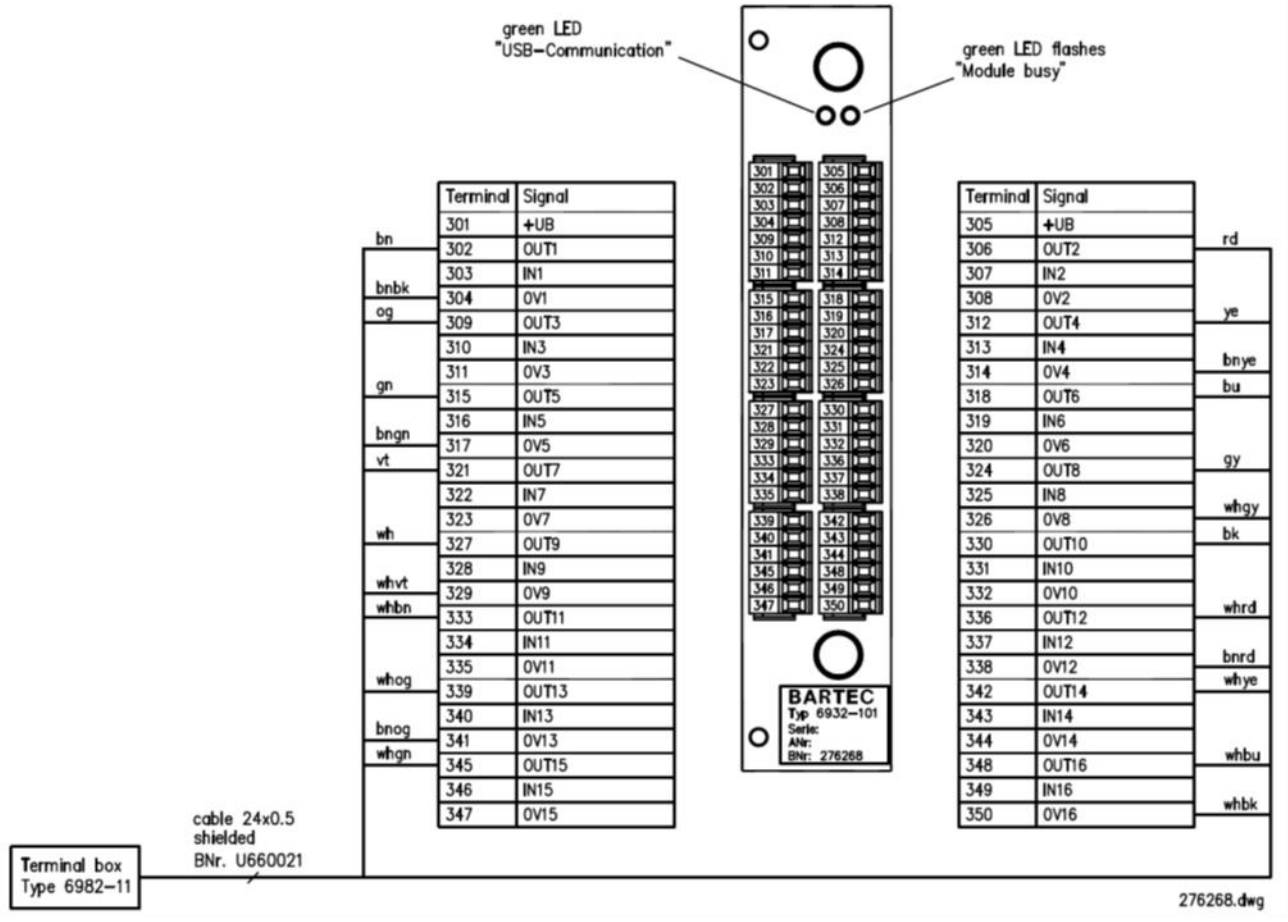
**Order details**

| Designation | Order number |
|---|---|
| Terminal box 16x2 Ex e type 6982-11 | 301743 |
| Cable 24x0, shielded, petrol-resistant<br>(not ready-made!) | U660021 |

## 7.6.2 Dimensions



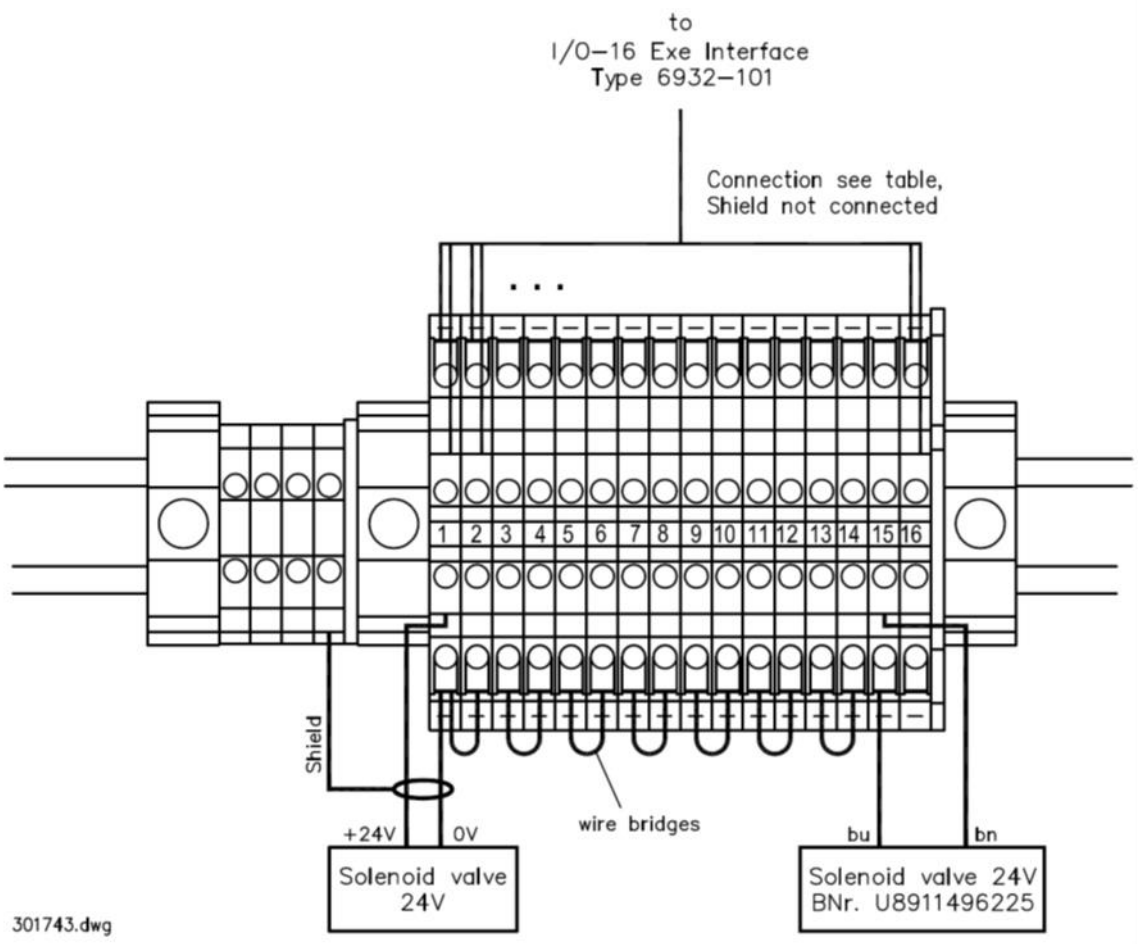

## 7.6.3 Terminal assignment




| Terminal | Signal | |
|---|---|---|
| 301 | +UB | bn |
| 302 | OUT1 | |
| 303 | IN1 | bnbk |
| 304 | 0V1 | og |
| 309 | OUT3 | |
| 310 | IN3 | gn |
| 311 | 0V3 | |
| 315 | OUT5 | bngn |
| 316 | IN5 | vt |
| 317 | 0V5 | |
| 321 | OUT7 | wh |
| 322 | IN7 | |
| 323 | 0V7 | |
| 327 | OUT9 | whvt |
| 328 | IN9 | whbn |
| 329 | 0V9 | |
| 333 | OUT11 | whog |
| 334 | IN11 | |
| 335 | 0V11 | |
| 339 | OUT13 | bnog |
| 340 | IN13 | whgn |
| 341 | 0V13 | |
| 345 | OUT15 | |
| 346 | IN15 | |
| 347 | 0V15 | |

| Terminal | Signal | |
|---|---|---|
| 305 | +UB | rd |
| 306 | OUT2 | |
| 307 | IN2 | ye |
| 308 | 0V2 | |
| 312 | OUT4 | bnye |
| 313 | IN4 | bu |
| 314 | 0V4 | |
| 318 | OUT6 | gy |
| 319 | IN6 | |
| 320 | 0V6 | |
| 324 | OUT8 | whgy |
| 325 | IN8 | bk |
| 326 | 0V8 | |
| 330 | OUT10 | whrd |
| 331 | IN10 | |
| 332 | 0V10 | |
| 336 | OUT12 | bnrd |
| 337 | IN12 | whye |
| 338 | 0V12 | |
| 342 | OUT14 | whbu |
| 343 | IN14 | |
| 344 | 0V14 | |
| 348 | OUT16 | whbk |
| 349 | IN16 | |
| 350 | 0V16 | |

Cable assignment



| I/O-16 Ex e Interface 6932-101 | | Cable U660021 | Terminal box 16x2 6982-11 |
|---|---|---|---|
| **Clamp** | **Signal** | **Wire** | **Clamp** |
| 302 | OUT1 | br | 1 |
| 304 | 0V1 | bnbk | 1- |
| 306 | OUT2 | rd | 2 |
| | | | 2-* |
| 309 | OUT3 | or | 3 |
| | | | 3-* |
| 312 | OUT4 | ye | 4 |
| 314 | 0V4 | bnye | 4- |
| 315 | OUT5 | gn | 5 |
| 317 | 0V5 | bngn | 5- |
| 318 | OUT6 | bl | 6 |
| | | | 6-* |
| 321 | OUT7 | vi | 7 |
| | | | 7-* |
| 324 | OUT8 | gr | 8 |
| 326 | 0V8 | whgr | 8- |
| 327 | OUT9 | wh | 9 |
| 329 | 0V9 | whvi | 9- |
| 330 | OUT10 | bk | 10 |
| | | | 10-* |
| 333 | OUT11 | whbn | 11 |
| | | | 11- |
| 336 | OUT12 | whrd | 12 |
| 338 | 0V12 | whrd | 12- |
| 339 | OUT13 | whor | 13 |
| 341 | 0V13 | whor | 13- |
| 342 | OUT14 | whye | 14 |
| | | | 14-* |
| 345 | OUT15 | whgn | 15 |
| | | | 15-* |
| 348 | OUT16 | whbl | 16 |
| 350 | 0V16 | whbk | 16- |

* If this output is used, a connection to the next 0 V terminal must be wired with a jumper (wire!) (see drawed jumpers)

## 7.7 Printer 24 V DC type 6881-30

### 7.7.1 Technical data

#### Device-specific Data

| | |
|---|---|
| Printing format | Alphanumerical character set with 96 ASCII-characters (font 5 x 7 / 7 x7)<br>32 international characters and 128 x 3 graphical characters (font 6 x 7 / 10 x 7)<br>4 letter sizes:<br>Standard, font 5 x 7 (35 characters/line),<br>Normal, font 7 x 7 (42 characters/line),<br>Wide, font 5 x 7 (17 characters/line),<br>Wide, font 7 x 7 (21 characters/line)<br>Line feed: 4.2 mm |
| Printing procedure | Needle printer 7 x 7<br>printing direction unidirectional |
| Printing speed | 1,9 ... 2,3 lines per second |
| Printing paper | Standard-, carbon- and self-copying paper<br>Entire thickness 0,09 ... 0,35 mm<br>Paper width at least 80 mm<br>Paper length at least 80 mm<br>Printing width max. 60 mm<br>Max. of 4 copies with self-copying paper (25° C) |
| Colour ribbon | Colour ribbon cassette black,<br>Life expactancy approx. 1,5 x $10^6$ characters |
| Data interface type 6961-100 | Serial interface (RS 232)<br>Cable length max. 10 m |

#### Electrical Data

| | |
|---|---|
| Power supply | DC 24 V ± 10 %, max. 1,0 A,<br>ripple ≤ 150 mV eff. |
| Connection | 25 pole socket (RS 232),<br>3 pole plugs (power supply DC 24 V) |

#### Ambient Conditions

| | |
|---|---|
| Operating temperature | +5° C … +40 °C |
| Storage temperature | -10° C … +50 °C |
| Climatic class | KYF |
| Protective system | IP 40 |

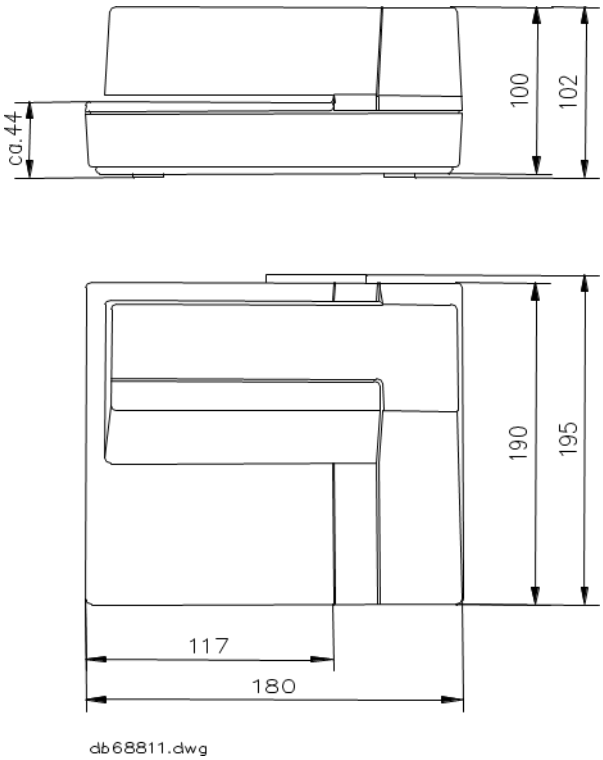
#### Mechanical Data

| | |
|---|---|
| Dimensions | 180 x 102 x 195 mm (B x H x T) |
| Weight | approx. 20 N (≅ 2 kg) |
| Housing | Plastics table-top housing, grey |

#### Order details

| Designation | Order number |
|---|---|
| Printer 24 V DC type 6881-30 | 235934 |

## 7.7.2 Dimensions




## 7.7.3 Printer Mount type 6961-100

Order No.: 279562

The printer mount may only be installed and operated in the non-hazardous area.

### 7.7.3.1 Connection

Connection Printer Mount before series A

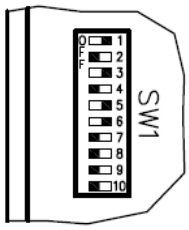
| Terminal | Terminal Connection<br>Printer Mount Type 6961-100 |
|---|---|
| 24 V | rd |
| RxD | ye |
| TxD | gn |
| GND | bl |

Connection Printer Mount from series A

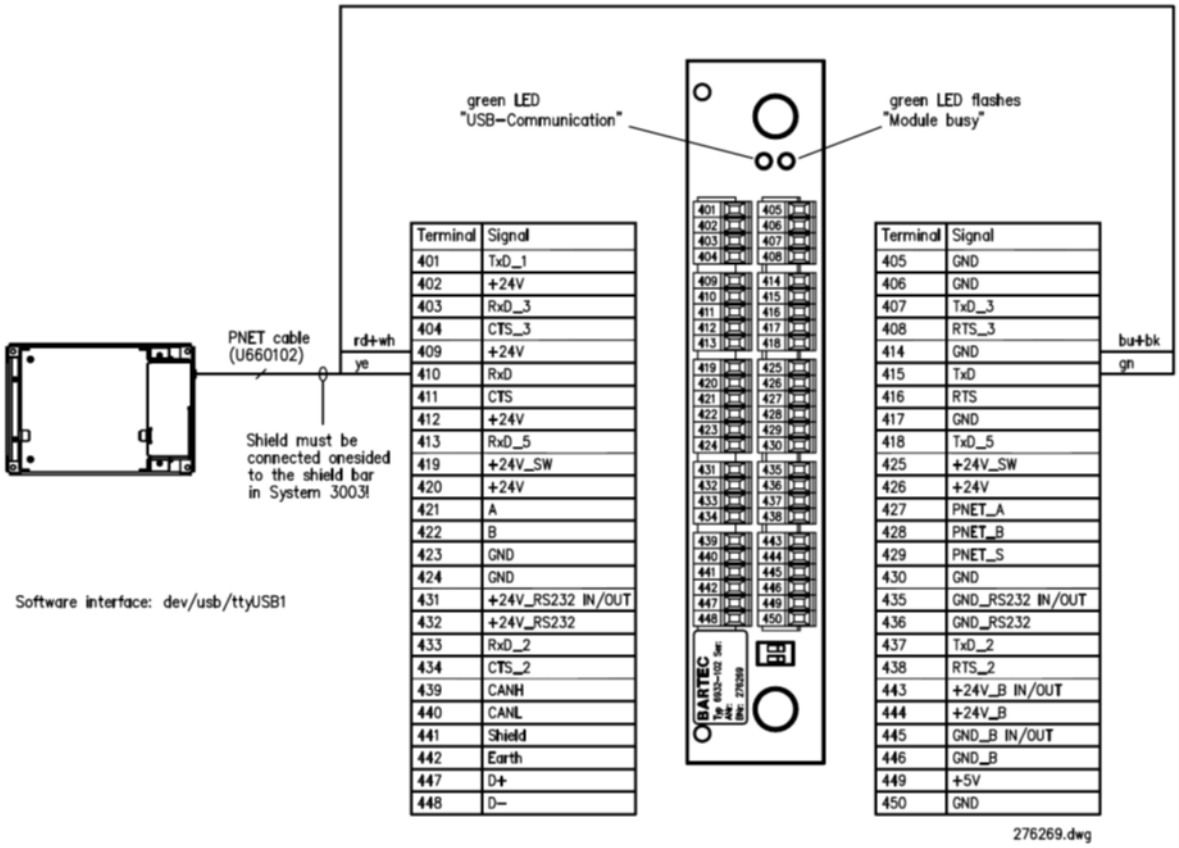
| Terminal | Terminal Connection<br>Printer Mount Type 6961-100 |
|---|---|
| 24 V | rd + wh |
| RxD | ye |
| TxD | gn |
| GND | bl + bk |

Dip-switch setting (bottom side):

Remove the adhesive label to change the dip-switch setting.

| Dip-switch No | Printer Mount Type 6961-100 |
|---|---|
| 1 | ON |
| 2 | OFF |
| 3 | ON |
| 4 | OFF |
| 5 | ON |
| 6 | ON |
| 7 | OFF |
| 8 | OFF |
| 9 | OFF |
| 10 | OFF |
| |  |

## 7.7.3.2 Terminal assignment to COMM Ex e interface type 6932-102/-117




Terminal assignment rd+wh (+24 V) effective from printer mount series A!

(see table terminal assignment)

| Terminals COMM Ex e interface type 6932-102/-117 | | Terminals printer mount type 6961-100 | |
|---|---|---|---|
| 409 | (+24V) | +24 V | (rd) |
| 410 | (RxD) | RxD | (ye) |
| 414 | (GND) | 0 V | (bl) and GND (bk) |
| 415 | (TxD) | TxD | (gn) |
| Shield bar → Fit shield | | | |
| Fuse SI8 for terminal 409 (+24V) Order No.: 286901 | | | |

Klemmenbelegung ab Serie A

| Terminals COMM Ex e interface type 6932-102/-117 | | Terminals printer mount type 6961-100 | |
|---|---|---|---|
| 409 | (+24V) | +24 V | (rd) and (wh) |
| 410 | (RxD) | RxD | (ye) |
| 414 | (GND) | 0 V | (bl) and GND (bk) |
| 415 | (TxD) | TxD | (gn) |
| Shield bar → Fit shield | | | |
| Fuse SI8 for terminal 409 (+24V) Order No.: 286901 | | | |

## 7.8 Form Printer 24 V 3003 type 6863-20

Printer must be turned on always separately with a button!

### 7.8.1 Technical data

**Device-specific Data**

| | |
|---|---|
| Print format | Alphanumeric and graphical characters with 19 international character sets |
| Fonts | Roman, Sans-serif, Courier, Bold, Prestige, Script, Orator, Gothic, OCR-A, OCR-B; Barcodes: UPC/A, UPS/E, EAN8, EAN13, Code 39, Code 128, Interleaved 2/5, Industrial 2/5 |
| Resolution | 180 x 120 dpi (draft), 180 x 360 dpi (LQ) |
| Pitch | 10 cpi(80 characters/line)<br>12 cpi(96 characters/line)<br>15 cpi(120 characters/line)<br>17.1 cpi(136 characters/line)<br>20 cpi(160 characters/line)<br>24 cpi(192 characters/line)<br>(depending on emulation used) |
| Line spacing | 3, 4, 5, 6, 8 lines per inch |
| Print head | 24 pin; working life 250 million characters |
| Memory | 64 kB |
| Standard printing language | IBM 2390+ (includes ProPrinter XL24E), Epson ESC/P2, Intermec 6820 |
| Printing method | Serial dot-matrix |
| Printing speed | at 10 cpi: 400 characters/second (draft);<br>at 12 cpi: 480 characters/second (draft);<br>at 10 cpi: 133 characters/second (letter) |
| Paper | Plain and form sets<br>Paper width: 102-167 mm<br>Paper length: > 102 mm (fanfold); 76-364 mm (single sheet)<br>Print width 216 mm max.<br>Number of copies: 1 original + 3 duplicates |
| Paper weight | 47 … 81 g/m² (single sheet)<br>40 … 64 g/m² (multi-copy forms) |
| Standard paper transport | Push tractor for fanfold paper, friction for single sheet, automatic advance to tear-off edge, parking position |
| Ink ribbon | Ribbon cartridge, black, 4 million characters |
| Interfaces | Serial interface (RS 232), USB 2.0 (full mode)<br>Optional interfaces: Bluetooth (version 1.2), W-LAN (IEEE 802.11b/g) |

## Electrical Data

| | |
|---|---|
| Input voltage | 10.5 - 28 V DC, max. 10 A, connector for vehicle on-board supply;<br>or<br>AC adapter 100 - 240 V ± 10 %, 47-63 Hz, 3.2 A |
| Power consumption | Power Off mode: 0.3 W<br>Sleep mode: 2.0 W<br>Standby: 7.0 W<br>Printing: max. 150 W |
| Printer driver | Windows 2000, XP (ESC/P2) |

## Ambient Conditions

| | |
|---|---|
| Operating temperature | -20° C … +60 °C |
| Storage temperature | -30° C … +65 °C |
| Protection class | IP22 |
| Climate class | JUF nach DIN 40040 |

## Mechanical Data

| | |
|---|---|
| Dimensions | 140 x 365 x 320 mm (H x B x T) |
| Weight | ca. 65 N (= 6,5 kg) |

## Order details

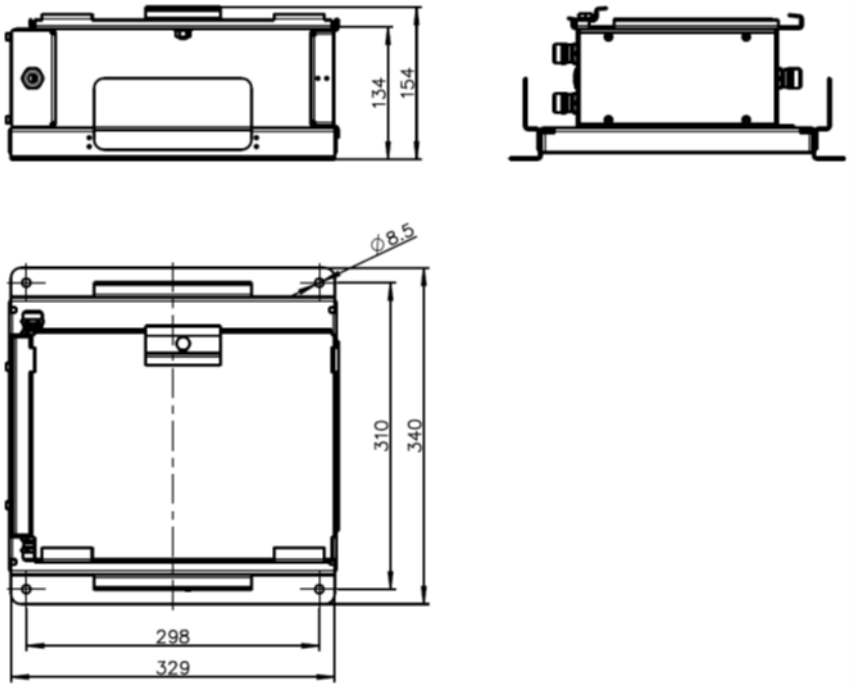
| Designation | Order number |
|---|---|
| Form Printer 24 V 3003, type 6863-20 | 290938 |

## 7.8.2 Printer Mount type 6962-100

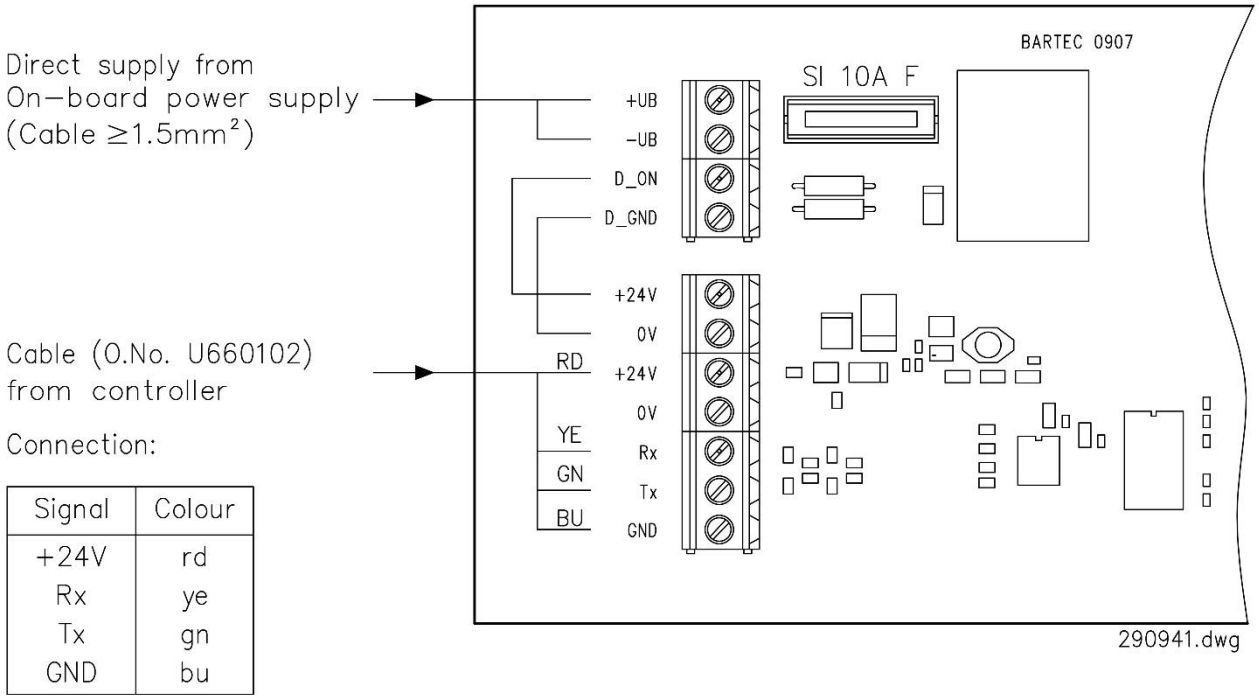
Order no: 290939

The printer mount may only be installed and operated in the non-hazardous area.

## 7.8.3 Dimensions



## 7.8.4 Connection



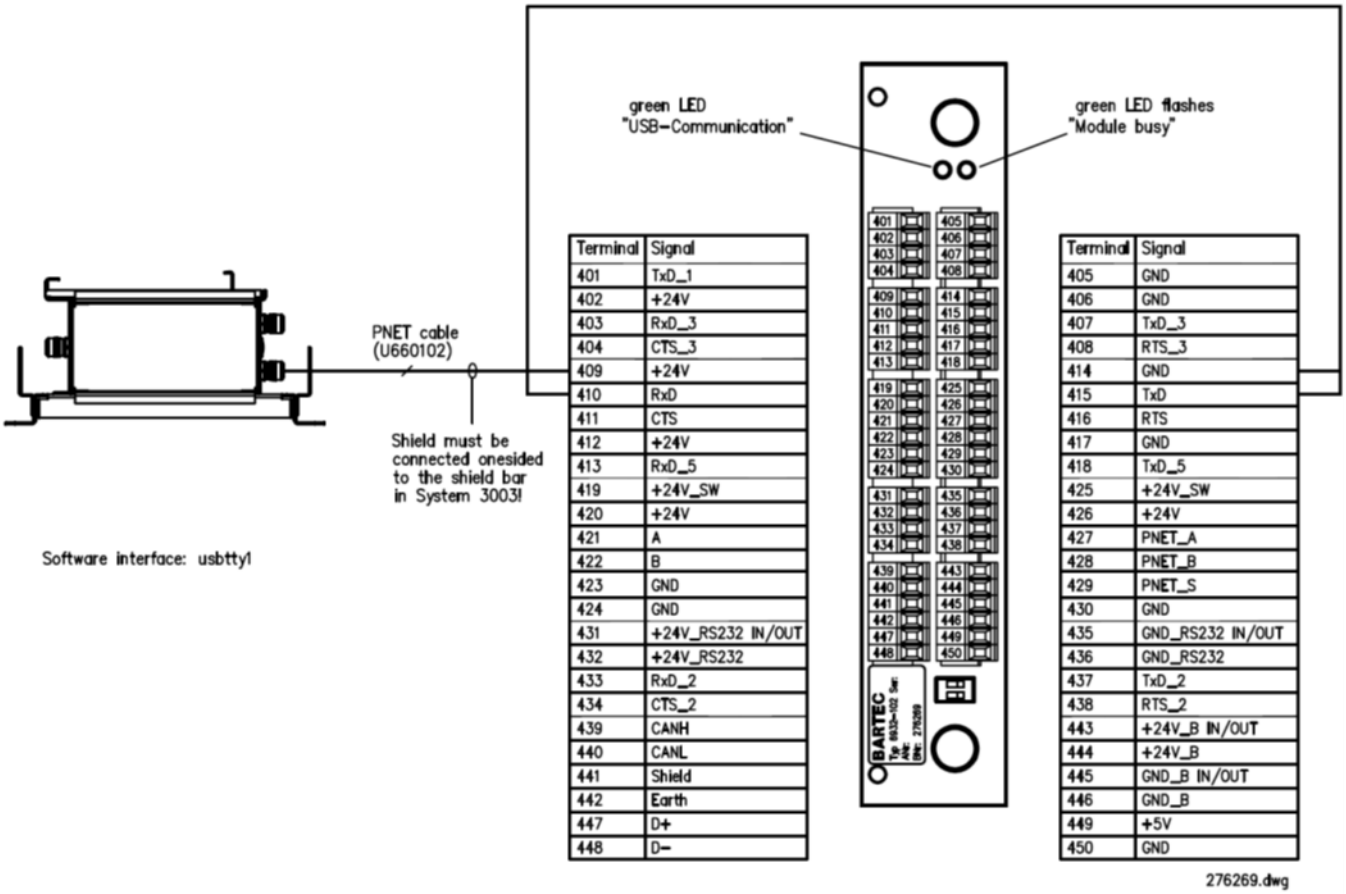

| Signal | Colour |
|---|---|
| +24V | rd |
| Rx | ye |
| Tx | gn |
| GND | bu |

Direct supply from the truck power supply (Cable ≥ 1.5mm²)

Cable (Article No. U660102) from the controller

| Terminal assignment | |
|---|---|
| +24 V | red |
| Rx | Yellow |
| Tx | green |
| GND | blue |

## 7.8.5 Connection to COMM Ex e interface type 6932-102/-117




| Terminal | Signal |
|---|---|
| 401 | TxD_1 |
| 402 | +24V |
| 403 | RxD_3 |
| 404 | CTS_3 |
| 409 | +24V |
| 410 | RxD |
| 411 | CTS |
| 412 | +24V |
| 413 | RxD_5 |
| 419 | +24V_SW |
| 420 | +24V |
| 421 | A |
| 422 | B |
| 423 | GND |
| 424 | GND |
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 439 | CANH |
| 440 | CANL |
| 441 | Shield |
| 442 | Earth |
| 447 | D+ |
| 448 | D- |

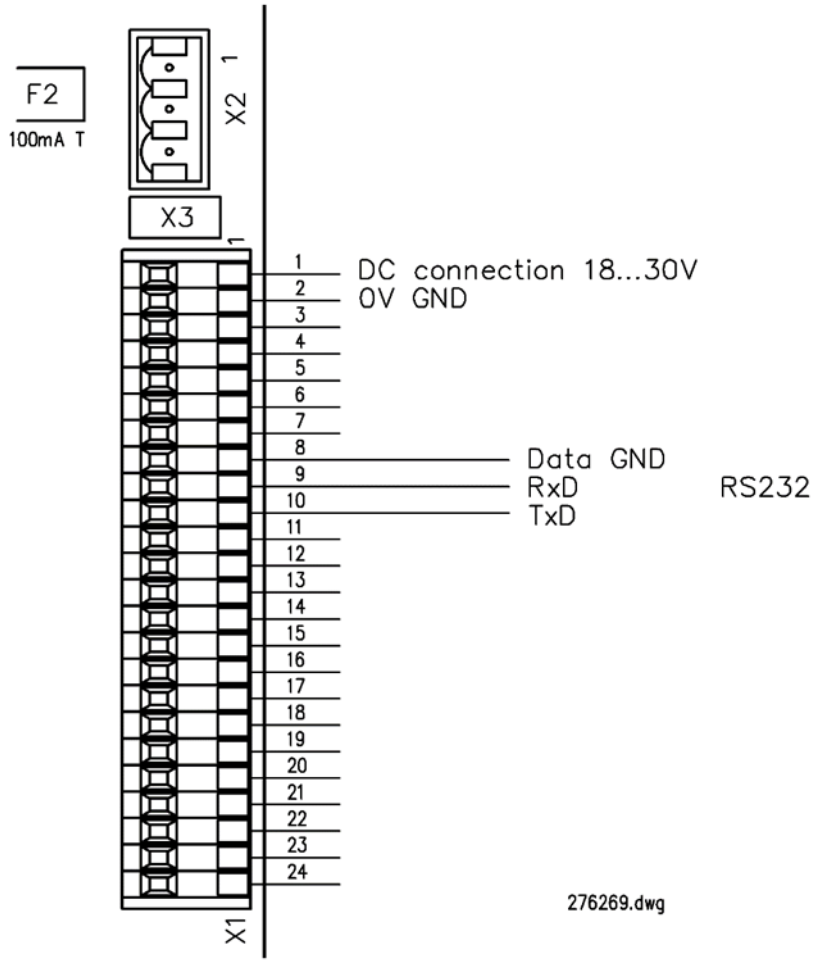
| Terminal | Signal |
|---|---|
| 405 | GND |
| 406 | GND |
| 407 | TxD_3 |
| 408 | RTS_3 |
| 414 | GND |
| 415 | TxD |
| 416 | RTS |
| 417 | GND |
| 418 | TxD_5 |
| 425 | +24V_SW |
| 426 | +24V |
| 427 | PNET_A |
| 428 | PNET_B |
| 429 | PNET_S |
| 430 | GND |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |
| 443 | +24V_B IN/OUT |
| 444 | +24V_B |
| 445 | GND_B IN/OUT |
| 446 | GND_B |
| 449 | +5V |
| 450 | GND |

| Terminals COMM Ex e interface type 6932-102/-117 | | Terminals printer mount type 6962-100 | |
|---|---|---|---|
| 409 | (+24V) | +24V | (rd) |
| 410 | (RxD) | Rx | (ye) |
| 414 | (GND) | GND | (bl) |
| 415 | (TxD) | Tx | (gn) |
| Shield bar -> Fit shield | | | |

# 7.9 Large Display

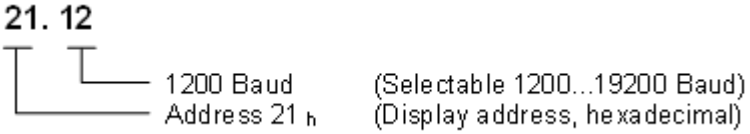
## 7.9.1 Schauf INDANZ (Option TS232)

### 7.9.1.1 Terminal Connections



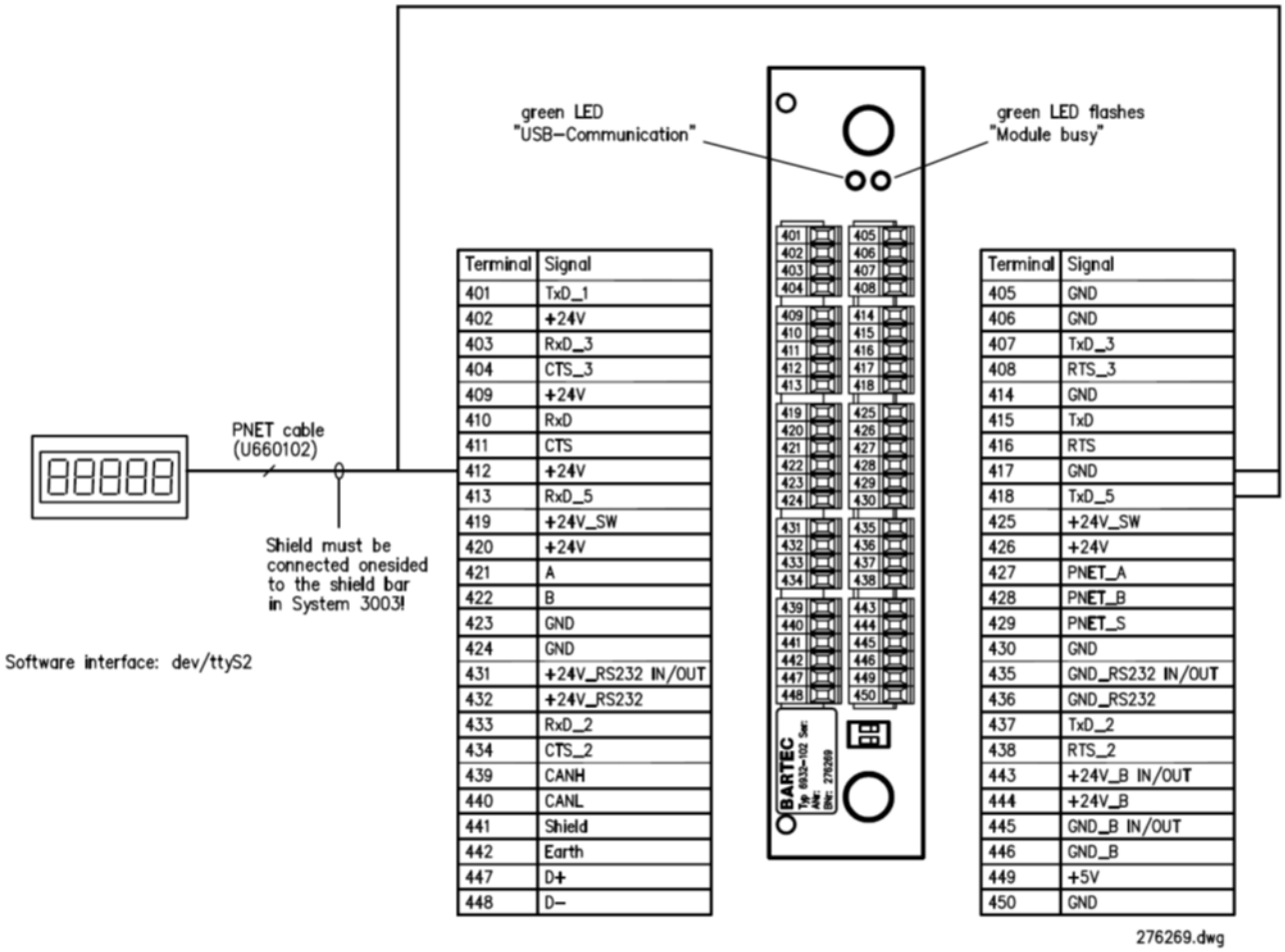

After the operating voltage is switched on, the display runs through a segment test in which a control signal is sent to each segment individually.

The display then displays the parameters that are currently set.




Once System 3003 has been initialised, only one dot at the bottom right-hand side of the display remains. The same is achieved by selecting the configuration or exiting this menu (test of the large display or sign for successfully powering up the system without HMI).

### 7.9.1.2 Connection to COMM Ex e interface type 6932-102/-117




| Terminal | Signal |
|---|---|
| 401 | TxD_1 |
| 402 | +24V |
| 403 | RxD_3 |
| 404 | CTS_3 |
| 409 | +24V |
| 410 | RxD |
| 411 | CTS |
| 412 | +24V |
| 413 | RxD_5 |
| 419 | +24V_SW |
| 420 | +24V |
| 421 | A |
| 422 | B |
| 423 | GND |
| 424 | GND |
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 439 | CANH |
| 440 | CANL |
| 441 | Shield |
| 442 | Earth |
| 447 | D+ |
| 448 | D– |

| Terminal | Signal |
|---|---|
| 405 | GND |
| 406 | GND |
| 407 | TxD_3 |
| 408 | RTS_3 |
| 414 | GND |
| 415 | TxD |
| 416 | RTS |
| 417 | GND |
| 418 | TxD_5 |
| 425 | +24V_SW |
| 426 | +24V |
| 427 | PNET_A |
| 428 | PNET_B |
| 429 | PNET_S |
| 430 | GND |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |
| 443 | +24V_B IN/OUT |
| 444 | +24V_B |
| 445 | GND_B IN/OUT |
| 446 | GND_B |
| 449 | +5V |
| 450 | GND |

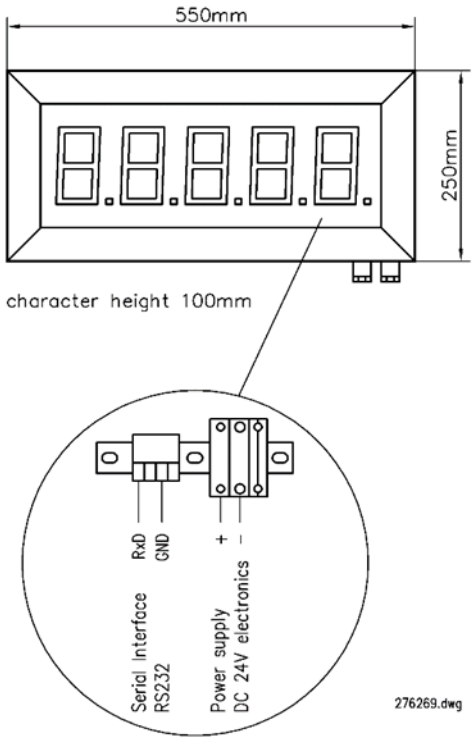
| Terminals COMM Ex e interface type 6932-102/-117 | | Terminals large display SCHAUF INDANZ (Option RS232) | |
|---|---|---|---|
| 412 | (+24V) | 1 (VDC) | (rd) |
| 417 | (GND) | 8 (Data_GND/bl) | 2 (0 V_GND/bk) |
| 418 | (TxD_5) | 9 (RxD) | (gn) |
| Shield bar -> Fit shield | | | |
| Fuse SI7 for terminal 412 (+24V) Order No.: 281772 | | | |

## 7.9.2 Schauf Industrial Display

(Option RS232, Five-Segment, SW: LED 24 WD)

### 7.9.2.1 Terminal connections

(Extract from Schauf-manual dated 22.12.08)



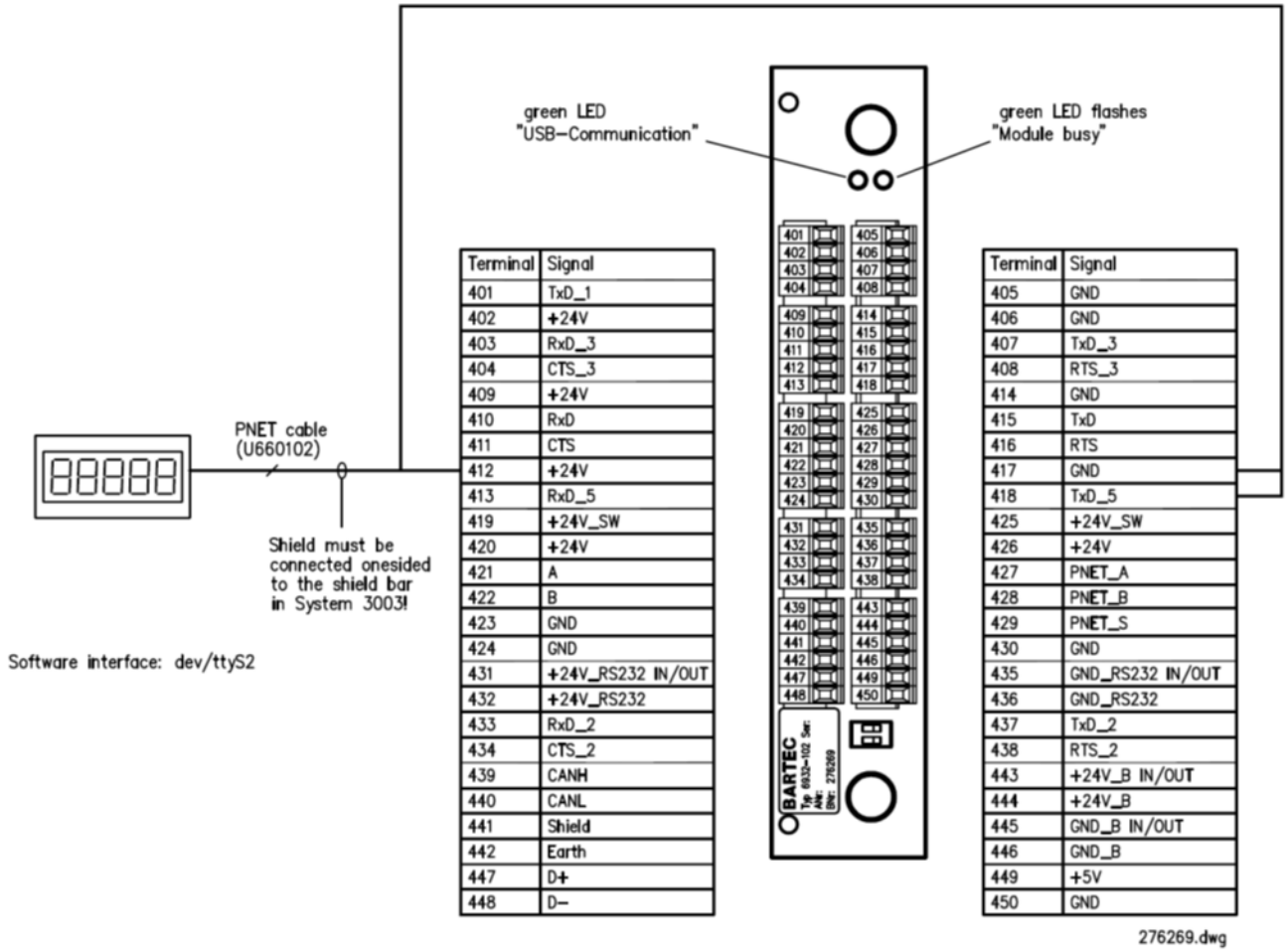

Original wiring: data cable (wh → Rxd; bn → GND)

Supply cable (bn → +; bl → -)

After the operating voltage is switched on, the display runs through a segment test in which a control signal is sent to each segment individually.

The Ex licence of the relevant unit manufactured by a third party must be checked with regard to installation and operation in the hazard areas or connection to the BARTEC system!

### 7.9.2.2 Connection to COMM Ex e interface type 6932-102/-117




| Terminal | Signal |
|---|---|
| 401 | TxD_1 |
| 402 | +24V |
| 403 | RxD_3 |
| 404 | CTS_3 |
| 409 | +24V |
| 410 | RxD |
| 411 | CTS |
| 412 | +24V |
| 413 | RxD_5 |
| 419 | +24V_SW |
| 420 | +24V |
| 421 | A |
| 422 | B |
| 423 | GND |
| 424 | GND |
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 439 | CANH |
| 440 | CANL |
| 441 | Shield |
| 442 | Earth |
| 447 | D+ |
| 448 | D– |

| Terminal | Signal |
|---|---|
| 405 | GND |
| 406 | GND |
| 407 | TxD_3 |
| 408 | RTS_3 |
| 414 | GND |
| 415 | TxD |
| 416 | RTS |
| 417 | GND |
| 418 | TxD_5 |
| 425 | +24V_SW |
| 426 | +24V |
| 427 | PNET_A |
| 428 | PNET_B |
| 429 | PNET_S |
| 430 | GND |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |
| 443 | +24V_B IN/OUT |
| 444 | +24V_B |
| 445 | GND_B IN/OUT |
| 446 | GND_B |
| 449 | +5V |
| 450 | GND |

| Terminals COMM Ex e interface type 6932-102/-117 | | Terminals large display SCHAUF industrial display (5-segment, RS 232) | |
|---|---|---|---|
| 412 | (+24V) | Top hat rail | (+bn) |
| 417 | (GND) | Top hat rail (-/bl), (GND/bn), connect clamps GND/bn and -/bl internal with wire | |
| 418 | (TxD_5) | Top hat rail | (RxD/wh) |
| Shield bar -> Fit shield | | | |
| Fuse SI7 for terminal 412 (+24V) Order No.: 286901 | | | |

Empty cable glands must be sealed with blind plugs!

## 7.9.3 Isoil Impianti LFD 6 (Model 7100)

### 7.9.3.1 DIP switch

Default setting:

| Switch | Position | Function |
|---|---|---|
| SW1 | ON | Serial communication activated |
| SW2 | OFF | Timeout disabled |
| SW3-SW6 | OFF | Address 1-8 |
| SW7 | OFF | Baud rate 19200 |


| SW | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| ON | x | | | | | | | |
| OFF | | x | X | x | X | x | x | X |

Setting with timeout functionality:

| Switch | Position | Function |
|---|---|---|
| SW1 | ON | Serial communication activated |
| SW2 | ON | Timeout activated |
| SW3-SW6 | OFF | Address 1-8 |
| SW7 | OFF | Baud rate 19200 |

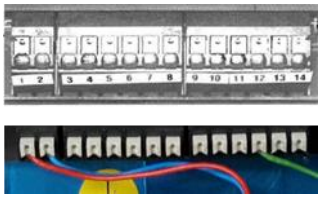
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| ON | x | x | | | | | | |
| OFF | | | x | x | X | x | x | X |

The large display expects a valid message within 2s. If this is not adhered to, "Err.01" appears on the large display. As soon as a valid message has been received, "Err.01" disappears.

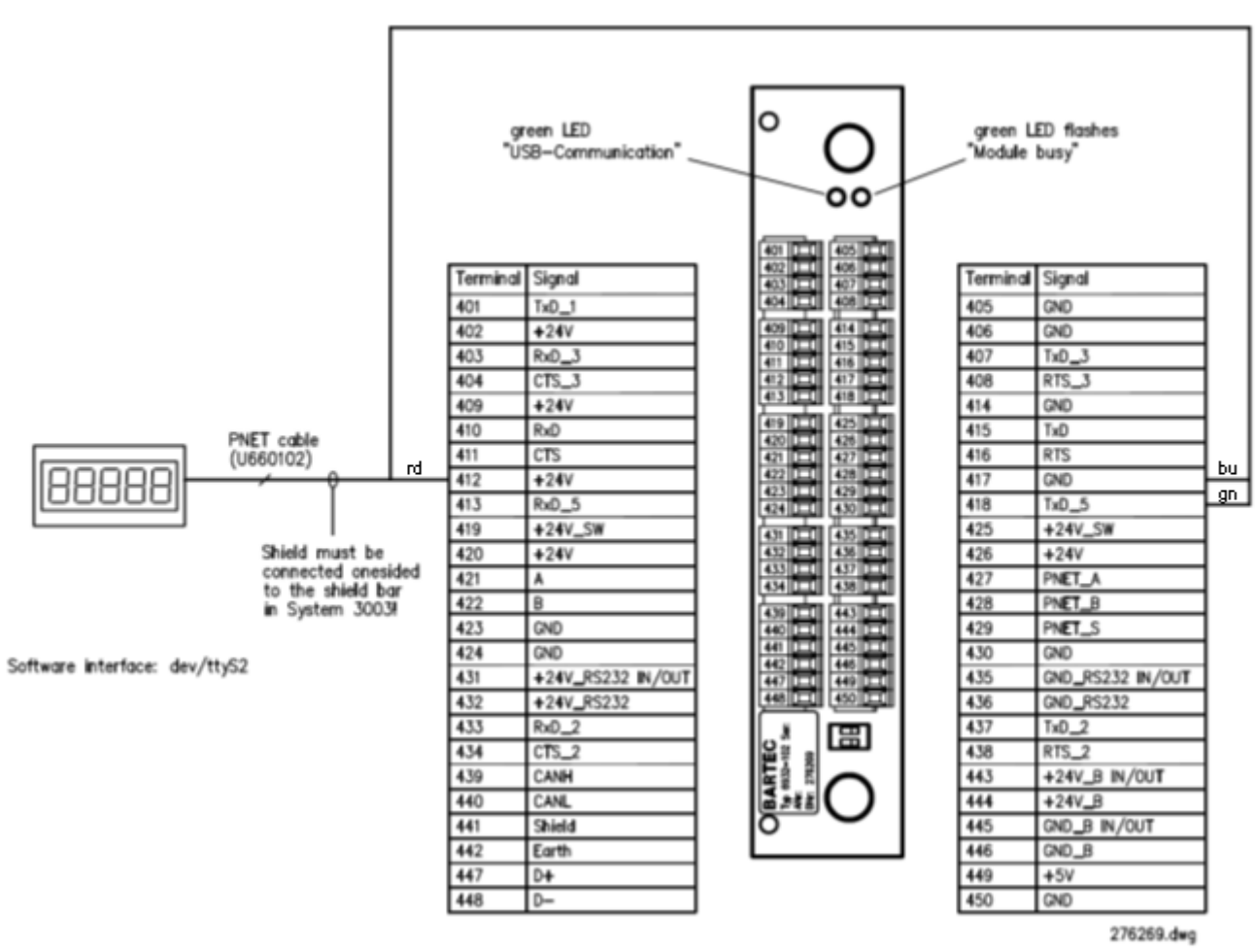
The time interval in which the large display is addressed by the application can be adjusted in the configuration menu "Large display".

### 7.9.3.2 Terminal connections

| Clamp | Function |
|---|---|
| 1 | (+) Power Supply |
| 2 | (-) GND |
| 12 | RX - RS232 |
| 13 | TX - RS232 |
| 14 | COMMON - RS232 |



### 7.9.3.3 Connection to COMM Ex e interface type 6932-102/-117




| Terminal | Signal |
|---|---|
| 401 | TxD_1 |
| 402 | +24V |
| 403 | RxD_3 |
| 404 | CTS_3 |
| 409 | +24V |
| 410 | RxD |
| 411 | CTS |
| 412 | +24V |
| 413 | RxD_5 |
| 419 | +24V_SW |
| 420 | +24V |
| 421 | A |
| 422 | B |
| 423 | GND |
| 424 | GND |
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 439 | CANH |
| 440 | CANL |
| 441 | Shield |
| 442 | Earth |
| 447 | D+ |
| 448 | D– |

| Terminal | Signal |
|---|---|
| 405 | GND |
| 406 | GND |
| 407 | TxD_3 |
| 408 | RTS_3 |
| 414 | GND |
| 415 | TxD |
| 416 | RTS |
| 417 | GND |
| 418 | TxD_5 |
| 425 | +24V_SW |
| 426 | +24V |
| 427 | PNET_A |
| 428 | PNET_B |
| 429 | PNET_S |
| 430 | GND |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |
| 443 | +24V_B IN/OUT |
| 444 | +24V_B |
| 445 | GND_B IN/OUT |
| 446 | GND_B |
| 449 | +5V |
| 450 | GND |

| Terminals COMM Ex e interface type 6932-102/-117 | | Cable U660102 | Clamps LFD-6 | |
|---|---|---|---|---|
| 412 | (+24V) | rd | 1 | (+) |
| 417 | (GND) | bu | 2 | (-) |
| 418 | (TxD_5) | gn | 12 | (RX - RS232) |
| Fuse SI7 for terminal 412 (+24V) Order No.: 286901 | | | | |

# 7.10 GPRS data modem type Telit GT864-Quad

- The modem housing (DGND) must not contact the chassis at any point. For this, the modem is fitted with the isolation set.
- Check the floating ground of the aerial adapter or the aerial.
- The shield bar must not be in contact with the aerial adapter or the modem housing.
- The length of the modem cable is limited to 10m. Any measures to lengthen the cable must be avoided.
- The components may only be installed and operated in the
- non-hazardous area.

## 7.10.1 Technical Data

### Ambient Conditions

| | |
|---|---|
| Operating voltage | 5 - 36 V DC |
| Operating temperature | -30 °C ... +75 °C |
| Storage temperature | -40 °C … +85 °C |
| Mounting | With two oval countersunk head screws M 3x8mm |

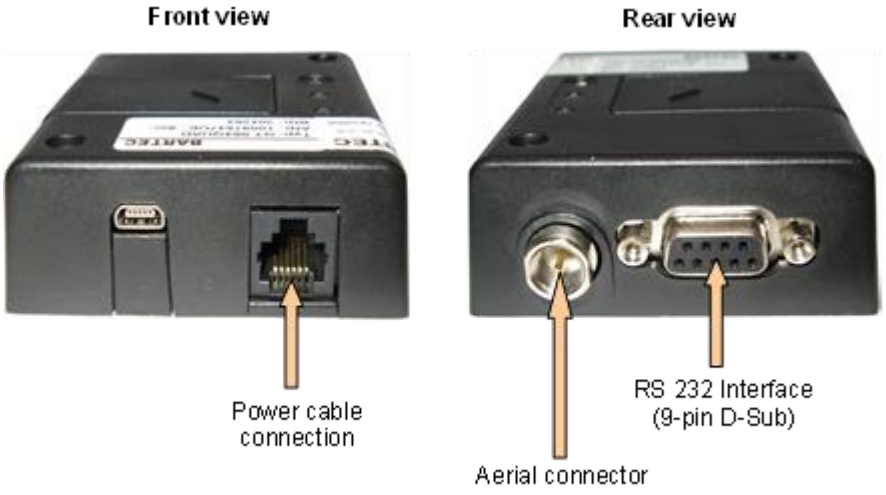
### Mechanical Data

| | |
|---|---|
| Dimensions | 77mm x 67mm x 26mm |
| Weight | Approx. 100 g |

### Order details

| Designation | Order number |
|---|---|
| GPRS data modem type Telit GT864-Quad | 304264 |

## 7.10.2 Connections




Inserting the SIM card

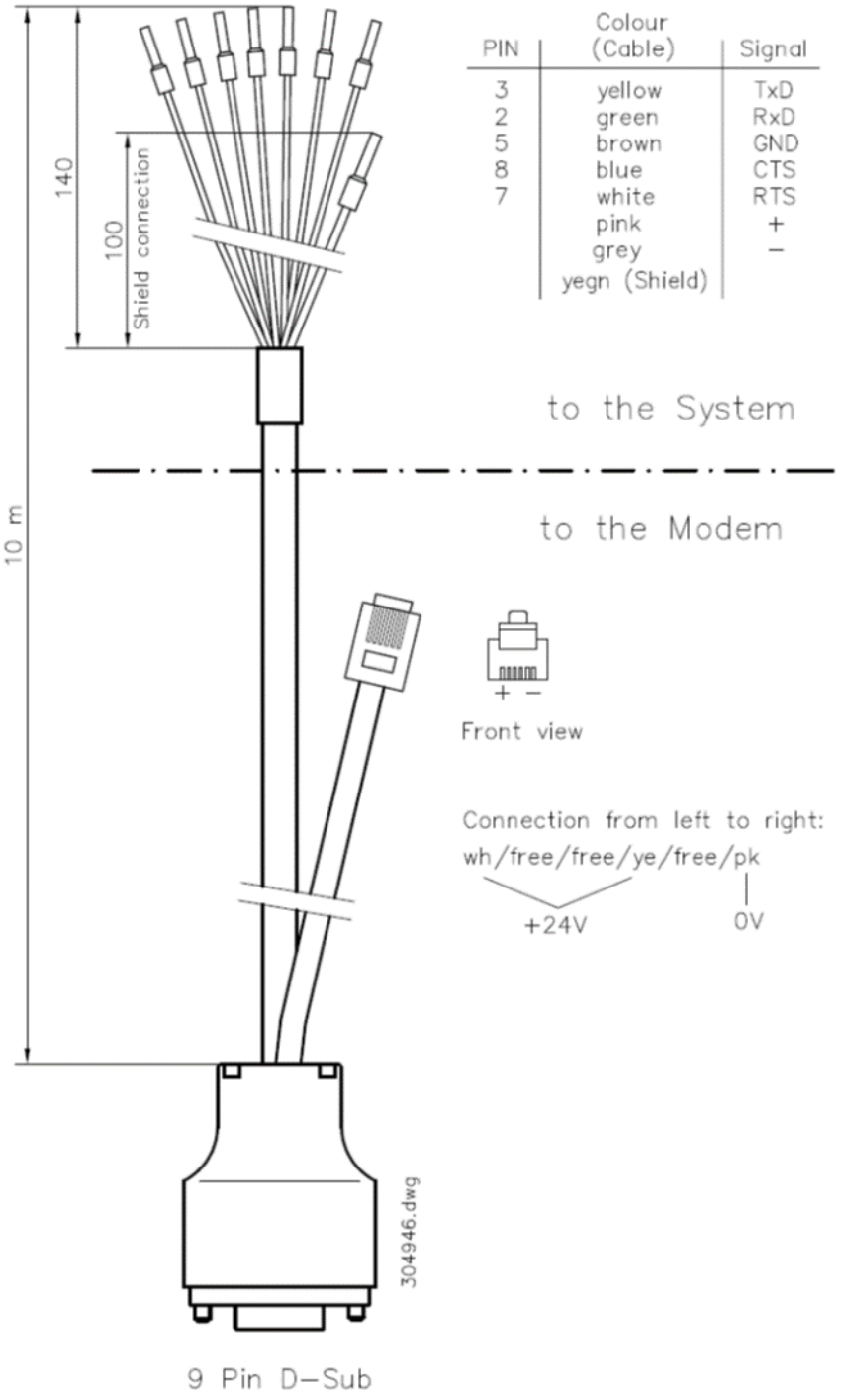
1. Open the cover

2. Open the card slot and insert the SIM card.

Change the SIM card only if the power supply is switched off!

### 7.10.2.1 Connecting cable GPRS data modem Telit GT864-Quad type 4386-306

(Order no. 304946, length 10 m)

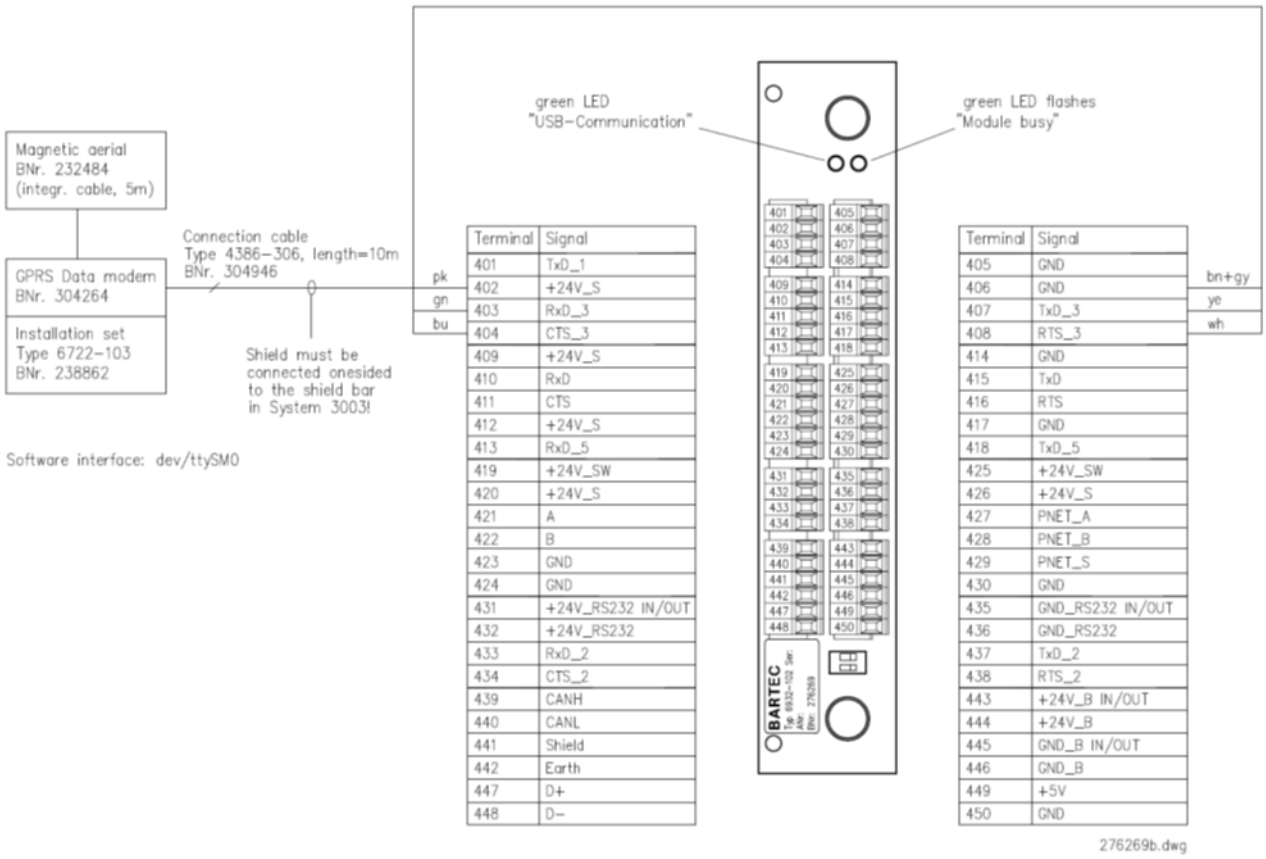



| PIN | Colour (Cable) | Signal |
|---|---|---|
| 3 | yellow | TxD |
| 2 | green | RxD |
| 5 | brown | GND |
| 8 | blue | CTS |
| 7 | white | RTS |
| | pink | + |
| | grey | – |
| | yegn (Shield) | |

## 7.10.3 Terminal assignment

### 7.10.3.1 GPRS data modem 1

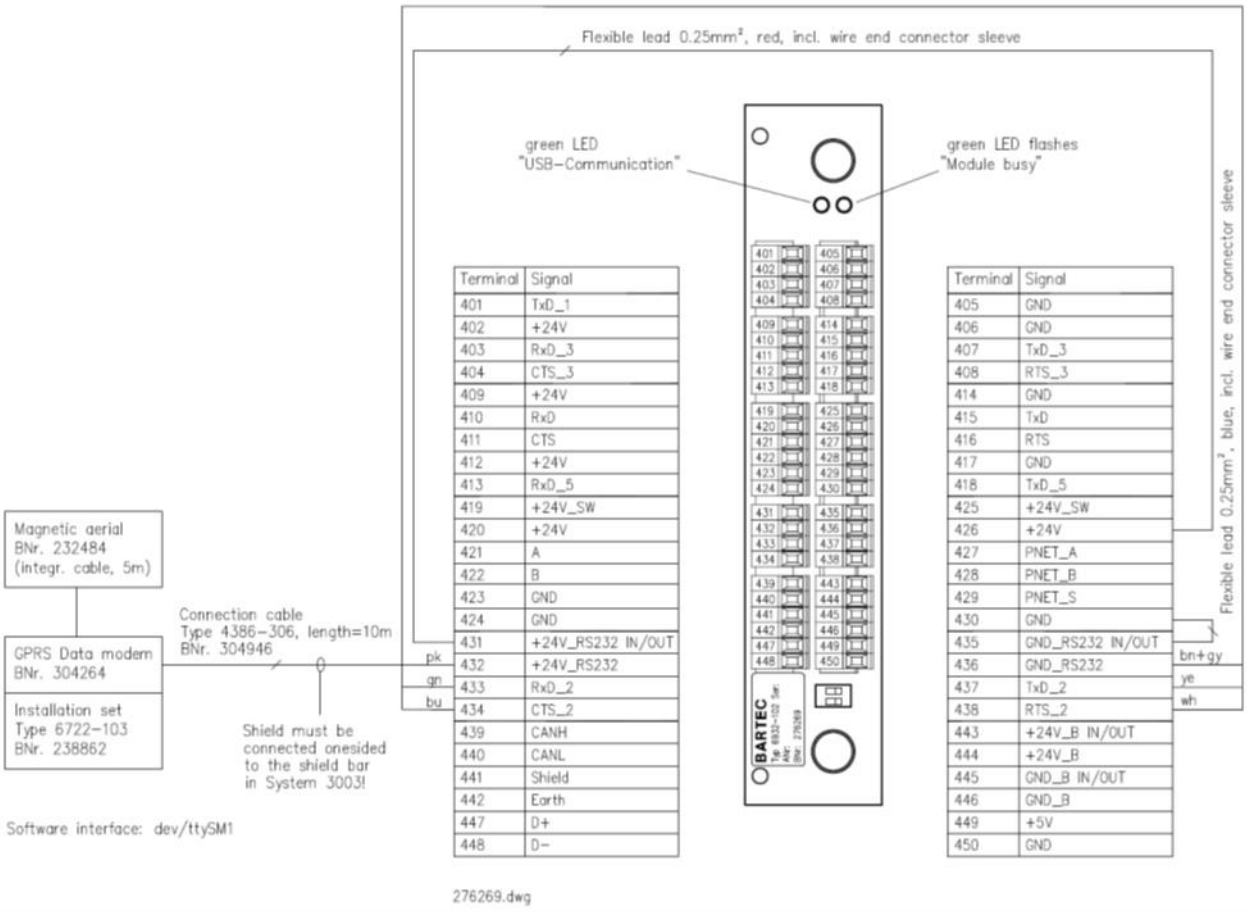
- Software interface: dev/ttySM0




| Terminals COMM Ex e interface<br>type 6932-102/-117 | | Modem cable<br>type 4386-306 |
|---|---|---|
| 402 | (+24V) | pink |
| 403 | (RxD_3) | green |
| 404 | (CTS_3) | blue |
| 406 | (GND) | grey/brown |
| 407 | (TxD_3) | yellow |
| 408 | (RTS_3) | White |
| Shield bar -> Fit shield ye/gn | | |

## 7.10.3.2 GPRS data modem 2 (optional)

- Software interface: dev/ttySM1




| Terminal | Signal |
|---|---|
| 401 | TxD_1 |
| 402 | +24V |
| 403 | RxD_3 |
| 404 | CTS_3 |
| 409 | +24V |
| 410 | RxD |
| 411 | CTS |
| 412 | +24V |
| 413 | RxD_5 |
| 419 | +24V_SW |
| 420 | +24V |
| 421 | A |
| 422 | B |
| 423 | GND |
| 424 | GND |
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 439 | CANH |
| 440 | CANL |
| 441 | Shield |
| 442 | Earth |
| 447 | D+ |
| 448 | D- |

| Terminal | Signal |
|---|---|
| 405 | GND |
| 406 | GND |
| 407 | TxD_3 |
| 408 | RTS_3 |
| 414 | GND |
| 415 | TxD |
| 416 | RTS |
| 417 | GND |
| 418 | TxD_5 |
| 425 | +24V_SW |
| 426 | +24V |
| 427 | PNET_A |
| 428 | PNET_B |
| 429 | PNET_S |
| 430 | GND |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |
| 443 | +24V_B IN/OUT |
| 444 | +24V_B |
| 445 | GND_B IN/OUT |
| 446 | GND_B |
| 449 | +5V |
| 450 | GND |

| Terminals COMM Ex e interface type 6932-102/-117 | | Modem cable type 4386-306 |
|---|---|---|
| 432 | (+24V_RS232) | pink |
| 433 | (RxD_2) | green |
| 434 | (CTS_2) | blue |
| 436 | (GND_RS232) | grey/brown |
| 437 | (TxD_2) | yellow |
| 438 | (RTS_2) | White |
| Shield bar -> Fit shield ye/gn | | |

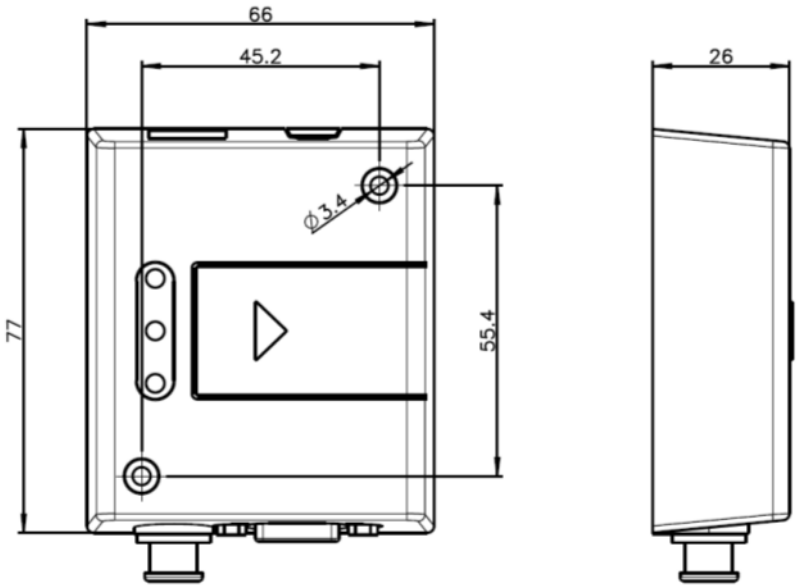
To supply the serial interface, the following terminals must be connected:

| Terminals COMM Ex e interface type 6932-102/-117 | | Terminals COMM Ex e interface type 6932-102/-117 | |
|---|---|---|---|
| 431 | (+24V_RS232 IN/OUT) | 426 | (+24V) |
| 435 | (GND_RS232 IN/OUT) | 430 | (GND) |

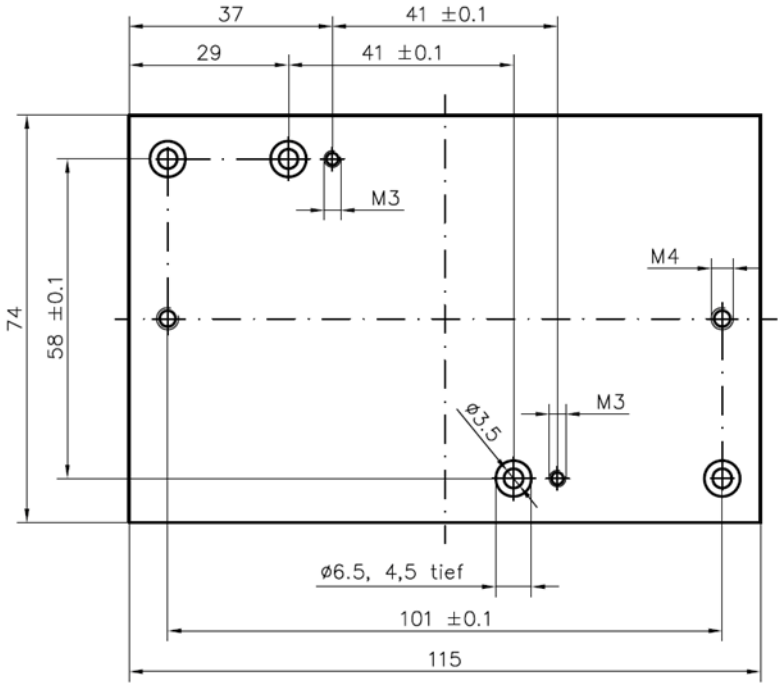
## 7.10.4 Installation and Dimensions

- Fit the modem in a dry, dust-free and dirt-free area in a non-hazardous area where it is not exposed to much vibration.

**Dimensions and mounting tabs**




**Installation set, type 6722-103, Order no. 238862**




t = 10 ±0.5

### 7.10.5 Magnetic aerial

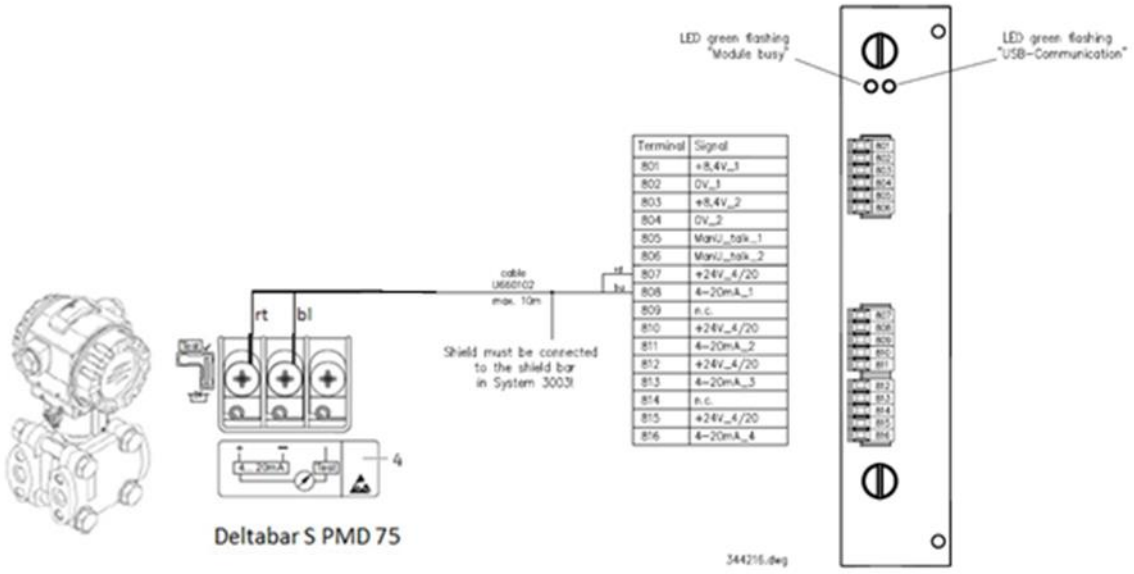
- Order no. 360422
- 60mm dia./H: 13mm
- Connection cable with FME socket, length: 5m
- Mount the aerial at a point where it will obtain good reception.
- It is not permitted to operate magnetic aerials in hazardous areas.
- A minimum distance of 30cm must be observed for other antennas.

## 7.11 Differential pressure sensor En-dress + Hauser Deltabar S PMD70/75

- The differential pressure sensor is used to monitor the water filter used on the tanker.
- For the use of the Deltabar S PMD70 / 75 differential pressure sensor, the documents provided by the manufacturer must be observed (e.g. mounting instructions for the differential pressure measurement of liquids).
- After mounting the differential pressure sensor, a zero point alignment (see manufacturer information) must be carried out.
- The adjusted measuring range of the differential pressure sensor can be taken from the enclosed final test report.
- Order information

| Manufacturer | Type | Order code |
|---|---|---|
| Endress+Hauser | Deltabar S PMD70 | PMD70-IAA7H1DABU |
| Endress+Hauser | Deltabar S PMD75 | PMD75-1BR7HB1DABA |

## 7.11.1 Connection to the i-Box 4-20 mA Interface type 6932-113




## 7.11.2 Functional Description

The differential pressure sensor is used to monitor the filter used on the refueling vehicle, e.g. a filter water separator or a filter monitor. For this purpose, the calibration data of the differential pressure sensor, the cartridge change-out curve and the maximum flow of the filter must be stored on the System 3003. The System 3003 monitors the current differential pressure (dP) and the differential pressure (dP%) extrapolated to 100% flow.

If the current dP exceeds the configurable limit value (parameter "JIG limit") at a flow rate greater than 0, a dialog message is displayed, the refueling lock for the next job is activated and the logical output 31 is set. The logical output 31 is withdrawn only after completion of the current order. Continuing refueling is therefore not possible. Only after resetting the password-protected refueling lock an order can be accepted again or a refueling process can be started.

The monitoring of the projected differential pressure dP% does not start until a configurable flow has been reached (parameter "min. flow"). In addition, only dP values at constant flow rates are used for extrapolation. The current and the extrapolated differential pressure are displayed during refueling (delivery window 2).

If the projected dP% exceeds the configurable limit value (parameter "max. diff. pressure") or if a differential pressure deviation between the projected dP% s greater than the configurable deviation (parameter "max. deviation") is detected, a dialogue message is displayed, the refueling lock for the next job is activated and the logical output 31 is set. The logical output 31 is withdrawn only after completion of the current order. Continuing refueling is therefore not possible. Only after the reset of the password-protected refueling lock an order can be accepted again or a refueling process can be started.

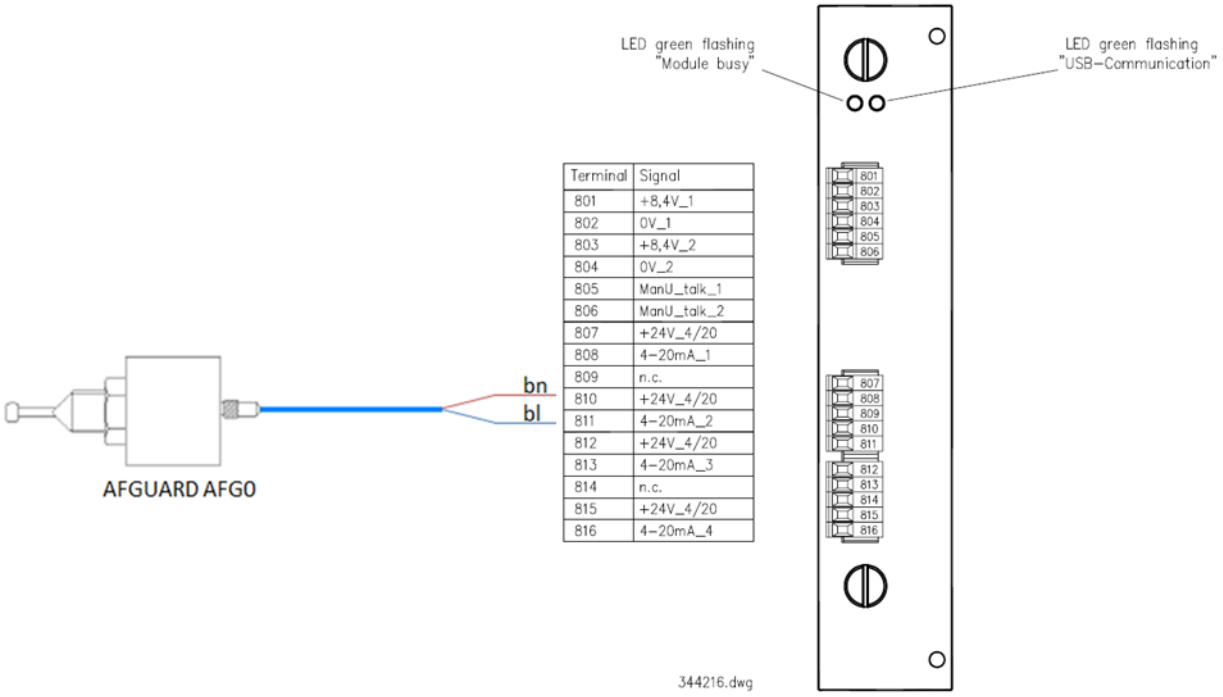
If, in addition, a warning value (parameter "Pressure warning at") is configured and is exceeded by the projected dP%, a dialog message is displayed.

The differential pressure sensor data, status, maximum dp%, and maximum deviation can be sent from system 3003 to the dispatch system.

# 7.12 Water sensor FAUDI Aviation Sensor AFGUARD AFG0

- The AFGUARD water sensor is used to measure free water in kerosene.
- For the use of the AFGUARD water sensor AFG0, the documents provided by the manufacturer must be observed.
- The measuring range of the AFGUARD AFG can be taken from the enclosed calibration sheet.
- The AFGUARD connection cable is supplied with the FAUDI Aviation Sensor.
- Power supply 24V, output signal 4-20mA

## 7.12.1 Connection to the i-Box 4-20 mA Interface type 6932-113




| Terminal | Signal |
|---|---|
| 801 | +8,4V_1 |
| 802 | 0V_1 |
| 803 | +8,4V_2 |
| 804 | 0V_2 |
| 805 | ManU_talk_1 |
| 806 | ManU_talk_2 |
| 807 | +24V_4/20 |
| 808 | 4-20mA_1 |
| 809 | n.c. |
| 810 | +24V_4/20 |
| 811 | 4-20mA_2 |
| 812 | +24V_4/20 |
| 813 | 4-20mA_3 |
| 814 | n.c. |
| 815 | +24V_4/20 |
| 816 | 4-20mA_4 |

## 7.12.2 Functional description

The use of a water sensor allows continuous monitoring of the free water in kerosene during refueling. For this purpose, the ppm values are aver-aged over the duration of refueling. The averaging only takes place when a configurable minimum flow (parameter "min. flow") is exceeded and a configurable minimum quantity (parameter "min. quantity") has been reached.

If the averaged ppm value exceeds the configurable maximum water content (parameter "max. water content") for a configurable period of time (parameter "time of exceeding"), a dialog message is displayed, the refueling lock for the next job is activated and the logical output 32 is set. The logical output 32 is withdrawn only after completion of the cur-rent order. Continuing refueling is therefore not possible. Only after re-setting the password-protected refueling lock an order can be accepted again or a refueling process can be started.

If the averaged ppm value exceeds the configurable warning value (parameter "Warning at") for a configurable period of time (parameter “time of exceeding warning"), a dialog message is displayed. The behavior of the logical output 32 can be configured if the warning value is exceeded (parameter "Stop at").

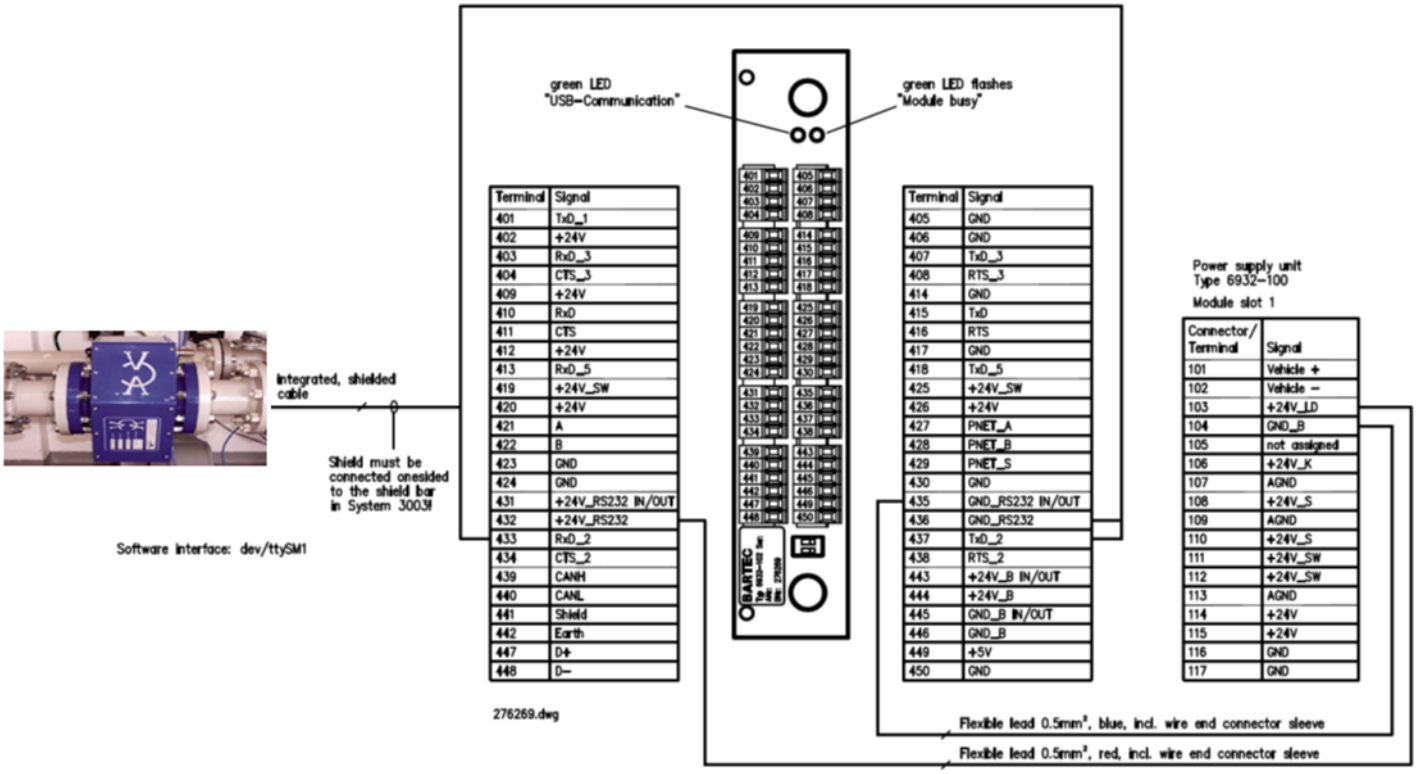
It is also possible to deactivate the water sensor for the transaction type TU and all return tank operations (parameters "during TU and Defueling").

The water sensor data, such as mean and status, can be sent from the System 3003 to the Dispatch system.

## 7.13 Water Sensor VELCON Type VCA-06xx

- The sensor is not supplied from System 3003.
- The DGND of the interface is connected to the truck chassis (measuring tube/flange) and the interface supplied with internal power is therefore used.
- A shielded cable is specified as a general requirement.
- Should a variant of the unit supply power at the cable +24V (10V…32V), then both terminal 432 (+24V_RS232) and terminal 436 (GND_RS232) can be used to supply the interface. The connections to the power supply unit are not required.

### 7.13.1 Connection to COMM Ex e interface type 6932-102/-117




| Terminals COMM Ex e interface type 6932-102/-117 | | VCA cable | Power supply unit 24 V type 6932-100 |
|---|---|---|---|
| 432 | (+24V_RS232) | | 103 (+24V_LD) flex. lead rd |
| 433 | (RxD_2) | ye/yellow (TxD) | |
| 435 | (GND_RS232_IN/OUT) | | 104 (GND_B) flex. lead bu |
| 436 | (GND_RS232) | Bn/brown (0V) | |
| 437 | (TxD_2) | Gn/green (RxD) | |
| Shield bar → Fit shield | | | |
| Fuse SI10 for terminal 432 (+24V_RS232) Order No.: 281772<br>Terminal 436 (GND_RS232) -> reversible fuse 3A | | | |

# 7.14 Dipstick Ex Analog 20…4 mA type 6706-12

## 7.14.1 Technical data

### Electrical data

| | |
|---|---|
| Operating voltage | DC 24 V ± 10% (stabilized) |
| Ripple voltage | ≤0,5V |
| Current consumption | ≤130mA + output signal |
| Reproducibility | 1µA |
| Measured data rate (max.) | 1kHz |
| Temperature coefficient | 0.76µA/°C |
| Output signal | 20…4mA |
| Connecting cable | 7 x 0.25 shielded, l = 15 m |

### Mechanical Data

| | |
|---|---|
| Weight | ca. 2kg/m |
| Housing material | Stainless steel |
| Equipment group/-category/ type of protection | II 1/2 G Ex d IIB + $H_2$ T3 … T6 Ga/Gb |
| Certificates | PTB 98 ATEX 1096 X<br>IECEx PTB 14.0010 X |
| Norms | EN 60079-0, EN 60079-1, EN 60079-26 |
| Dimensional drawing | See dimensional drawing |
| Protection category per IEC 529 | IP 67 |

### Ambient Conditions

| | |
|---|---|
| Operating temperature | -20 … +60 °C |
| Operating pressure | 0.8 bar … 1.1 bar |
| Shock load according to EN 60068 | 100g/6ms |
| Vibration according EN 60068 | 12 g, 10 bis 2000 Hz |

### Order details

| Designation | Order number |
|---|---|
| Order | 6706-12/xxxx/0, xxxx = Order length in mm |
| **Accessories** | |
| Flange for dipstick 20...4 mA, type 6706-120 | 373277 |
| Terminal box analog dipstick 20…4 mA, type 6982-15 | 375336 |
| Float, type 6706-109 | 279355 |

## 7.14.2 Safety instructions

**Installation instructions:**

- The safety regulations EN 60079-14, EN 50 018, EN 50 284 have to be complied with in the hazardous area.
- When the system is installed in metallic tanks, the potential equalization takes place via direct metallic contact. With insulated installation, a ground conductor or an equipotential bonding conductor has to be connected directly. All ground conductors and equipotential bonding conductors have to be joined in a ground point.
- The connection cables of the dipsticks have to be stationary.
- The mechanic connection to a tank wall, container wall or pipe wall has to be flameproof. This can be achieved by means of an integral thread M 18 x 1.5 and a depth of thread ≥ 7.5 mm (= 5 threads).

**Application is only admissible:**

- under operational atmospheric conditions (temperature = - 20 °C ... + 60 °C, pressure = 0.8 bar ... 1.1 bar)
- in group IIA or IIB (if H2 is present, further restrictions with regard to the mechanic connection have to be observed, cf. EN 60079-26 in connection with EN 60079-1.
- with vertical installation

**Special Conditions:**

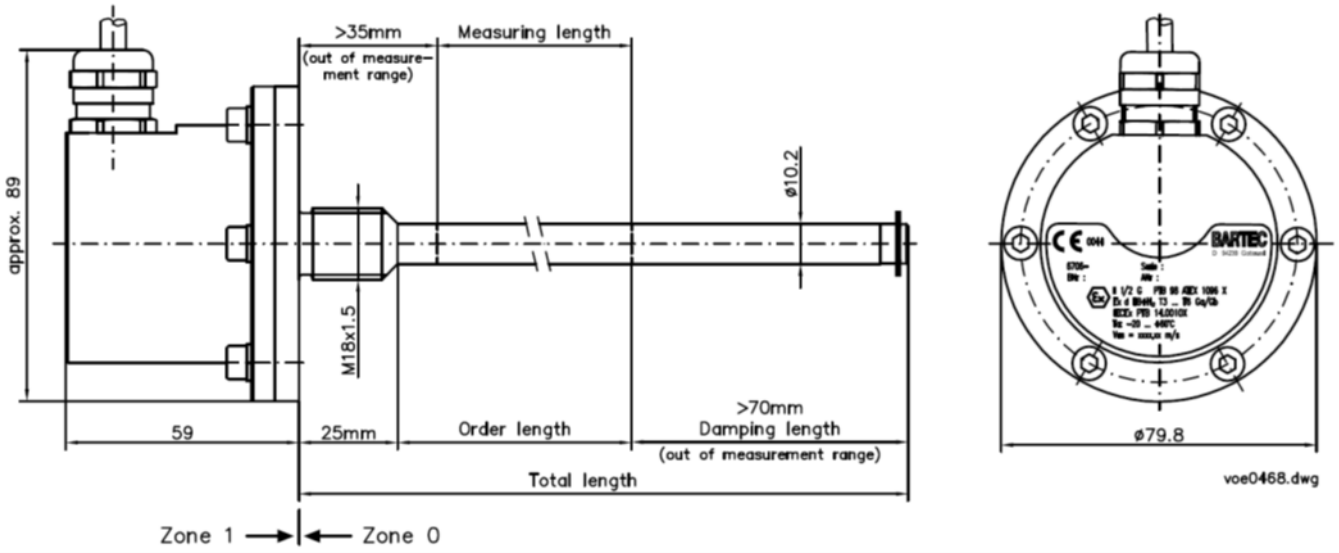
- Repairs on the flameproof joints may only be carried out in compliance with the manufacturer's construction specifications. Repairs in accordance with the values in Tables 1 and 2 of EN 60079-1 are not permitted.
- Any components which are to be installed and fitted (e.g. connection boxes, feed-throughs, Ex cable glands, connectors) must comply with the standards specified on the cover sheet as a minimum and must have a separate test certificate.
- The conditions of use described in the corresponding component certificates must be strictly followed.

**Connection Conditions**

- Dipstick type 6706-1./…./. should be connected using suitable cable glands or conduit systems which meet the requirements set out in EN 60079-1 Sections 13.1 and 13.2 and have a separate test certificate.
- Cable glands of simple construction (PG glands) and sealing plugs of simple construction may not be used. When connecting dipstick type 6706-1./…./. using a conduit entry approved for this purpose, the associated capping system must be placed directly on the housing.
- Unused openings must be sealed in compliance with EN 60079-1 Section 11.9.
- The connecting cables of the dipsticks should be fixed and laid in such a way as to be sufficiently protected from damage.
- Dipstick type 6706-1./…./. should be integrated in the local equipotential bonding system.
- When installed in metallic tanks, the equipotential bonding is established by direct metallic contact. With insulated installation, an earthing or equipotential bonding conductor must be connected directly. All earth and equipotential bonding conductors must be bundled at an earthing point.
- The connection cables (cable tail) of dipstick type 6706-1./…./. must be connected in a housing which meets the requirements of a recognised ignition protection type pursuant to EN 60079-0 Section 1 if the connection is performed in an explosive area.
- The mechanical connection to a tank, container or conduit wall must be flameproof. This can be accomplished using M18x1.5 screw-in thread and a screw-in depth of ≥7.5 mm (= 5 thread turns).
- The connection cable must not be shortened or lengthened.

## 7.14.3 Dimensions and mounting

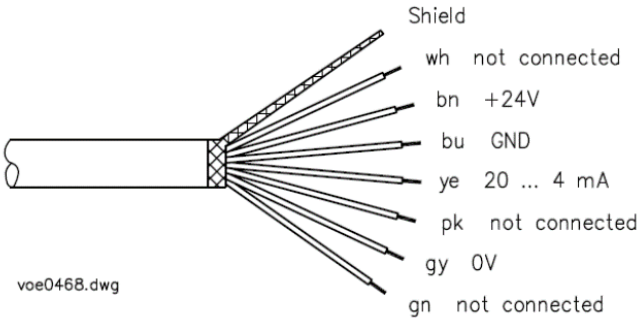
- The standard nominal length of the dipsticks is in the range of
- 500 ... 3500 mm.
- The ordering length (mm) of the dipstick results from the total length minus the non-measurable range and the damping length:
- Order length = total length - 95 mm
- The order length is included in the type designation of the dipstick and can be found on the nameplate.
- Type: 6706-12/xxxx/0, xxxx = Order length in mm
- The order length is also the nominal length of the dipstick and is required for later configuration. (See configuration instructions).
- During assembly, it must be ensured that the float is always within the measuring length.




The dipstick housing must not be opened.

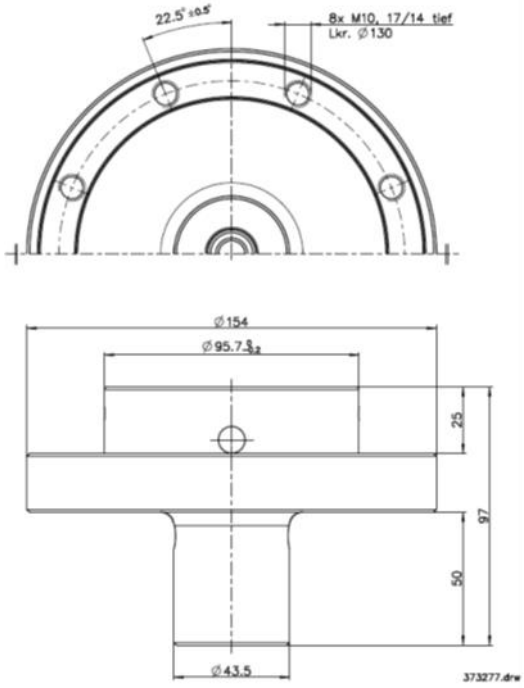
The connection cable must not be shortened or lengthened.

## 7.14.4 Terminal assignment




## 7.14.5 Flange for dipstick 20…4 mA, type 6706-120

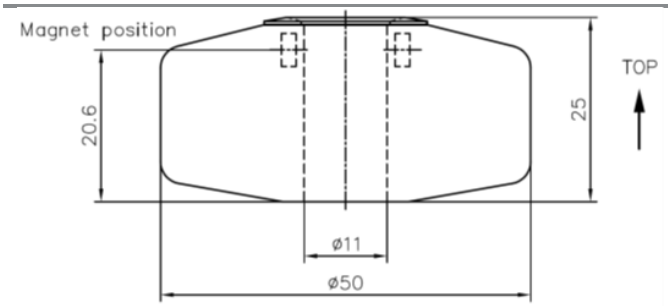
### Flange, type 6706-120




| | |
|---|---|
| Housing material | Alu |
| Weight | 1.1 kg |
| Operating temperature | -20 … +60 °C |

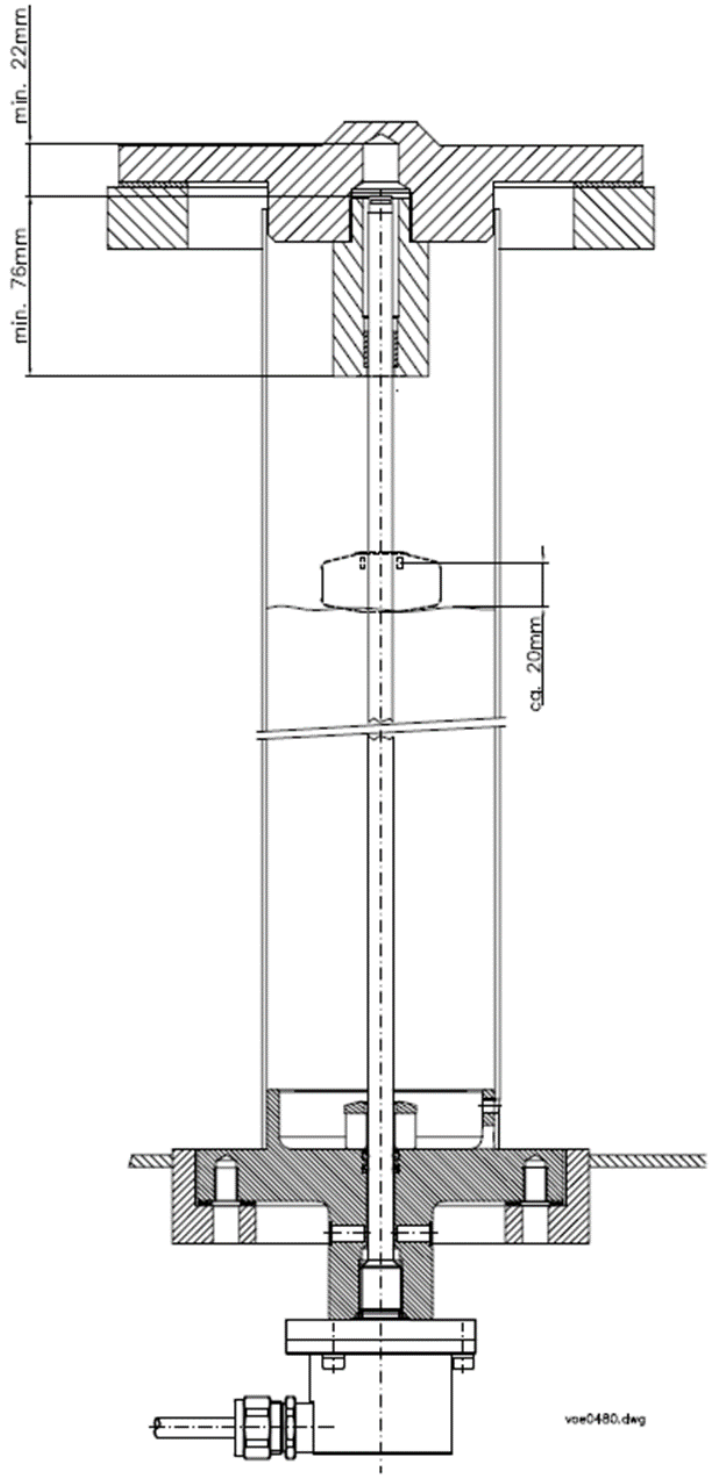
## 7.14.6 Float type 6706-109

### Float, type 6706-109




| | |
|---|---|
| Housing material | PA / NBR-Compound |
| Pressure load (static) | 0.05 MPa = 0.5 bar max |
| Operating temperature | -20 … +60 °C |

## 7.14.7 Installation example



## 7.14.8 Terminal box analog dipstick 4-20 mA, type 6982-15

### 7.14.8.1 Technical data

#### Electrical data

| | |
|---|---|
| Supply voltage | DC 24V stabilized from Power supply 24V (Typ 6932-100),<br>Fuse 315 mA,<br>Cable 2 x 0.5 mm² shielded (wire size ≥ 0.5 mm²) |
| Input signal | 4-20 mA signal (passive/sink) with supply line<br>Ex e<br>Fuse 63 mA |
| Output signal | 4-20 mA signal (passive/sink)<br>Ex i<br>Cable 2 x 0.5 mm² shielded (wire size ≥ 0.5 mm²), colour of sheath blue (or corresponding marking) |

#### Ambient Conditions

| | |
|---|---|
| Operating temperature | -20 … +50 °C |
| Storage temperature | -20 … +70 °C |
| Protection class | IP66 to DIN 40050 |
| Climatic category | JWF to DIN 40050 |

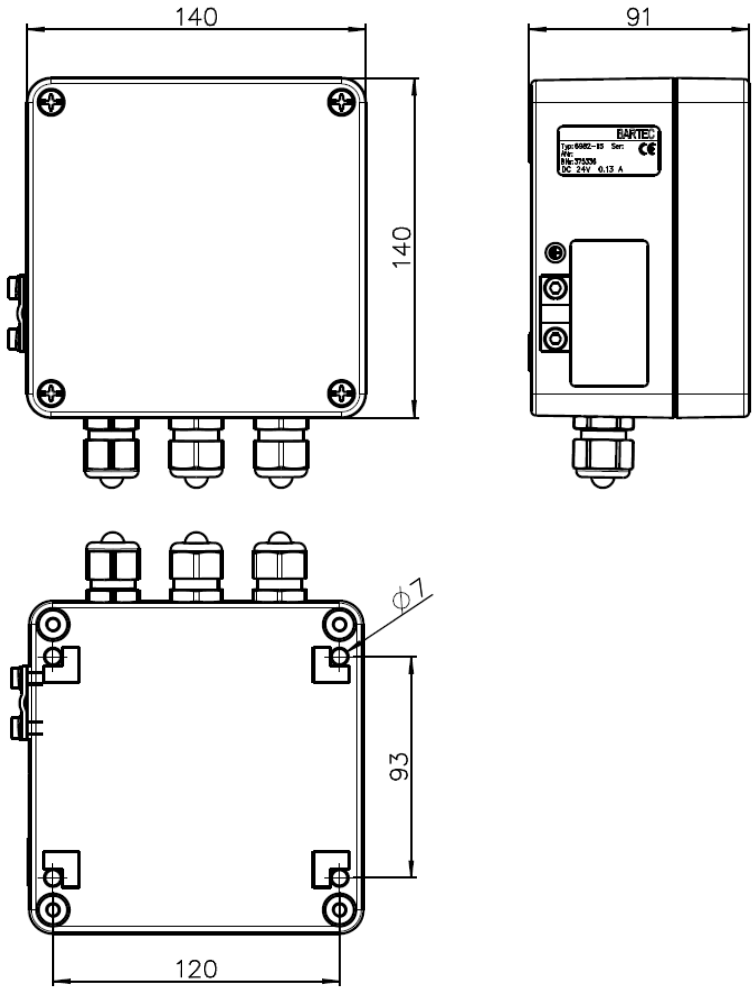
#### Mechanical Data

| | |
|---|---|
| Weight | approx. 1.6 kg |
| Housing | Aluminium |
| Equipment group/-category/ type of protection | II 2 G Ex e IIC T6 Gb |
| Certificate | PTB 00 ATEX 1063 |
| Norms | EN 60079-0, EN 60079-7 |
| Dimensions | see dimensional drawing |

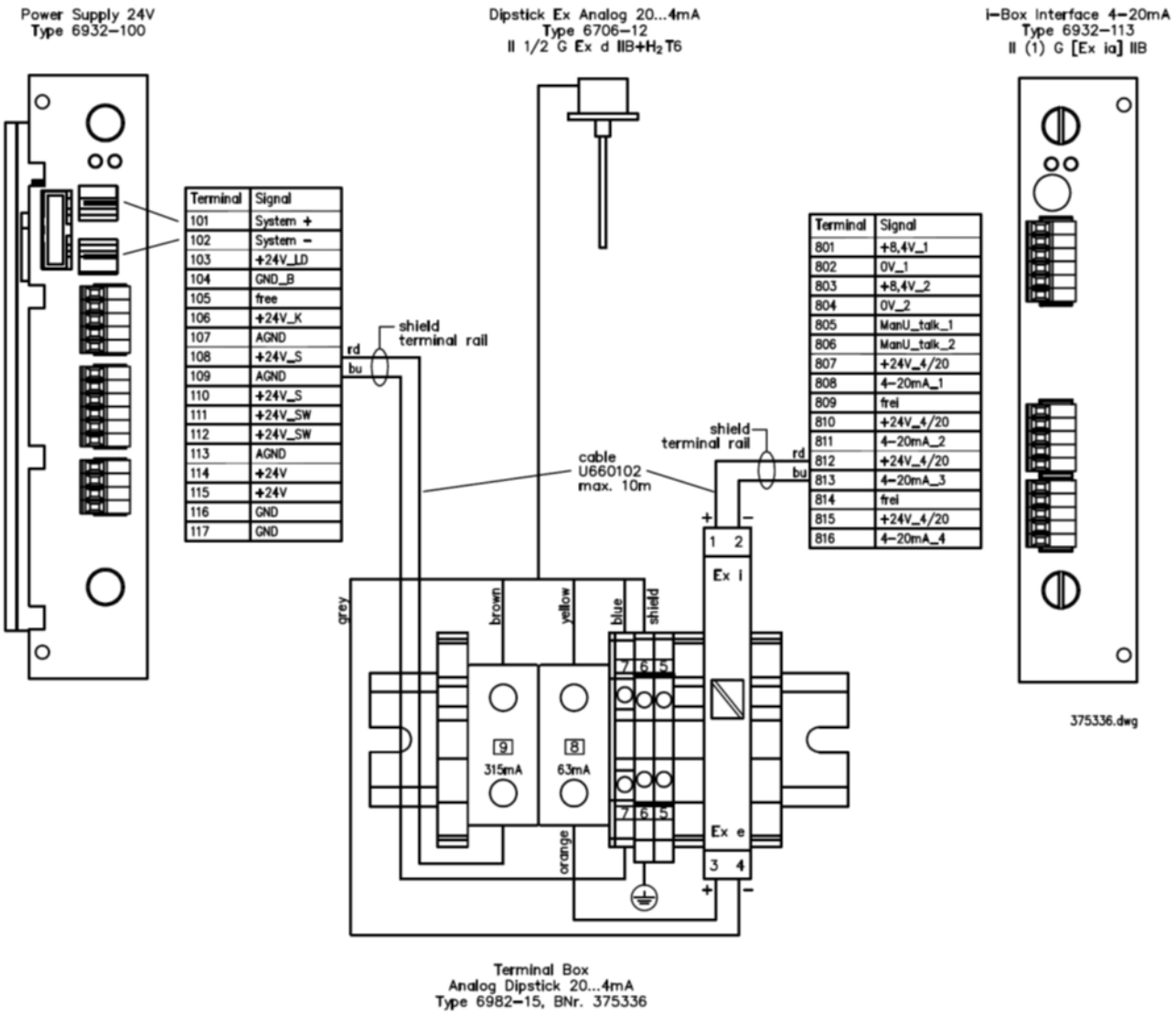
#### Order details

| Designation | Order number |
|---|---|
| Terminal box analog dipstick 20…4 mA, Typ 6982-15 | 375336 |
| Fuse element 63 mA M Ex | 375367 |
| Fuse element 315 mA M Ex | 375377 |

### 7.14.8.2 Dimensions and mounting



## 7.14.8.3 Terminal assignment



# 7.15 i-Box Namur type 6912-11

The i-Box Namur allows connecting different interlock sensors.

## 7.15.1 Technical data

### Electrical data

| | |
|---|---|
| Power supply | Intrinsically safe circuit "+8.4V_1"<br>for connection to I-Box interface type 6932-109 / -112<br>connection "+8.4V_1" and "0V_1"<br>Ex ia IIB<br>nominal voltage DC 8.4 V, current consumption 0.05 A<br>Ui ≈ DC 10 V, Ii ≈ 500 mA, Pi ≈ 1.25 W, Ci ≈ 0 µF<br>Li ≈ 0 mH |
| Data interfaces | Intrinsically safe bidirectional data interface "ManU_talk"<br>for connection to I-Box interface type 6932-109 / -112<br>connection "ManU_talk" and "0V_1" or<br>"ManU_talk" and "0V_1"<br>Ex ia IIB<br>nominal voltage: DC 8.4 V<br>Uo ≈ DC 10 V, Io ≈ 100 mA, Po ≈ 250 mW, Ri ≈ 100 Ω<br>Co ≈ 20 µF, Lo ≈ 0.01 mH or<br>Co ≈ 11 µF, Lo ≈ 0.1 mH, or<br>Co ≈ 5,8 µF, Lo ≈ 1 mH<br>for connection to a data protection circuit<br>maximum input voltage Ui: DC 10 V<br>Ri ≈ 100 Ω, Ci ≈ 0 µF, Li ≈ 0 mH |
| NAMUR sensors | 18 x NAMUR two-wire sensors<br>Intrinsically safe sensor circuits "OUT1/IN1" to "OUT18/IN18"<br>connections "OUT_1" / "IN1" to "OUT18" / "IN18"<br>each<br>Ex ia IIB<br>nominal voltage DC 8.4 V<br>Uo ≈ DC 10 V, Io ≈ 34 mA, Po ≈ 85 mW, Ri ≈ 300 Ω<br>Co ≈ 20 µF, Lo ≈ 0.01 mH or<br>Co ≈ 11 µF, Lo ≈ 0.1 mH or<br>Co ≈ 5.7 µF, Lo ≈ 1 mH |
| Through-wiring electrical circuits | Intrinsically safe through-wiring circuit "+8.4V_2"<br>connections "+8.4V_2" and "0V_2"<br>Ex ia IIB<br>nominal voltage:<br>DC 8.4 V, Ui/Uo<br>DC 10 V, Ii/Io ≈ 500 mA, Ci ≈ 0 µF, Li ≈ 0 mH |
| Potential-free shielded connections | Intrinsically safe shielded connection circuits "Sh"<br>Sh<br>each<br>Ex ia IIB<br>Ci ≈ 6 nF, Li ≈ 0 mH |
| Cable gland | 20 x M16 x 1.5 plastic |
| Connection | Terminals 1,5 mm², pluggable |

### Ambient Conditions

| | |
|---|---|
| Operating temperature | - 20 … + 50 °C (Ex-approval to +60 °C) |
| Storage temperature | - 20 … + 50 °C (+60 °C) |
| Climatic Class | JWF according to DIN 40040 |
| Protection type | IP65 (IP66) |
| Equipment group/category / Ignition protection type | II 2 (1) G Ex ia [ia Ga] IIB T4 Gb |
| EC-type examination certificate | BVS 10 ATEX E 106 |
| Standards | EN 60079-0, EN 60079-11, EN 60079-14, EN 60079-26 |

### Device-specific Data

| | |
|---|---|
| Nominal conditions | 23 ± 2 °C |

### Mechanical Data

| | |
|---|---|
| Dimensions | See Dimension Drawing |
| Weight | 16 N (1.6 kg) |

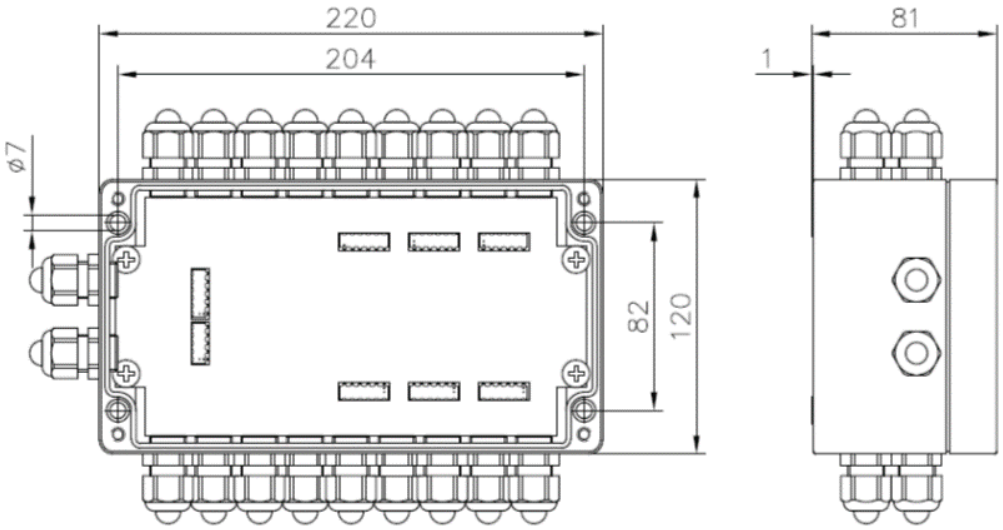
### Order details

| Designation | Order number |
|---|---|
| i-Box Namur type 6912-11 | 292975 |

## 7.15.2 Safety instructions

- The connection cable and wires of the i-Box must be fixed and protected from mechanical damage.
- When selecting and mounting the instrinsically safe connection cables and wires, Paragraphs 12.2 and 12.3 of EN 60079-14 must be followed.
- Only electrically passive, suitable for the respective zone, intrinsically safe components can be connected to the inputs.

## 7.15.3 Dimensions

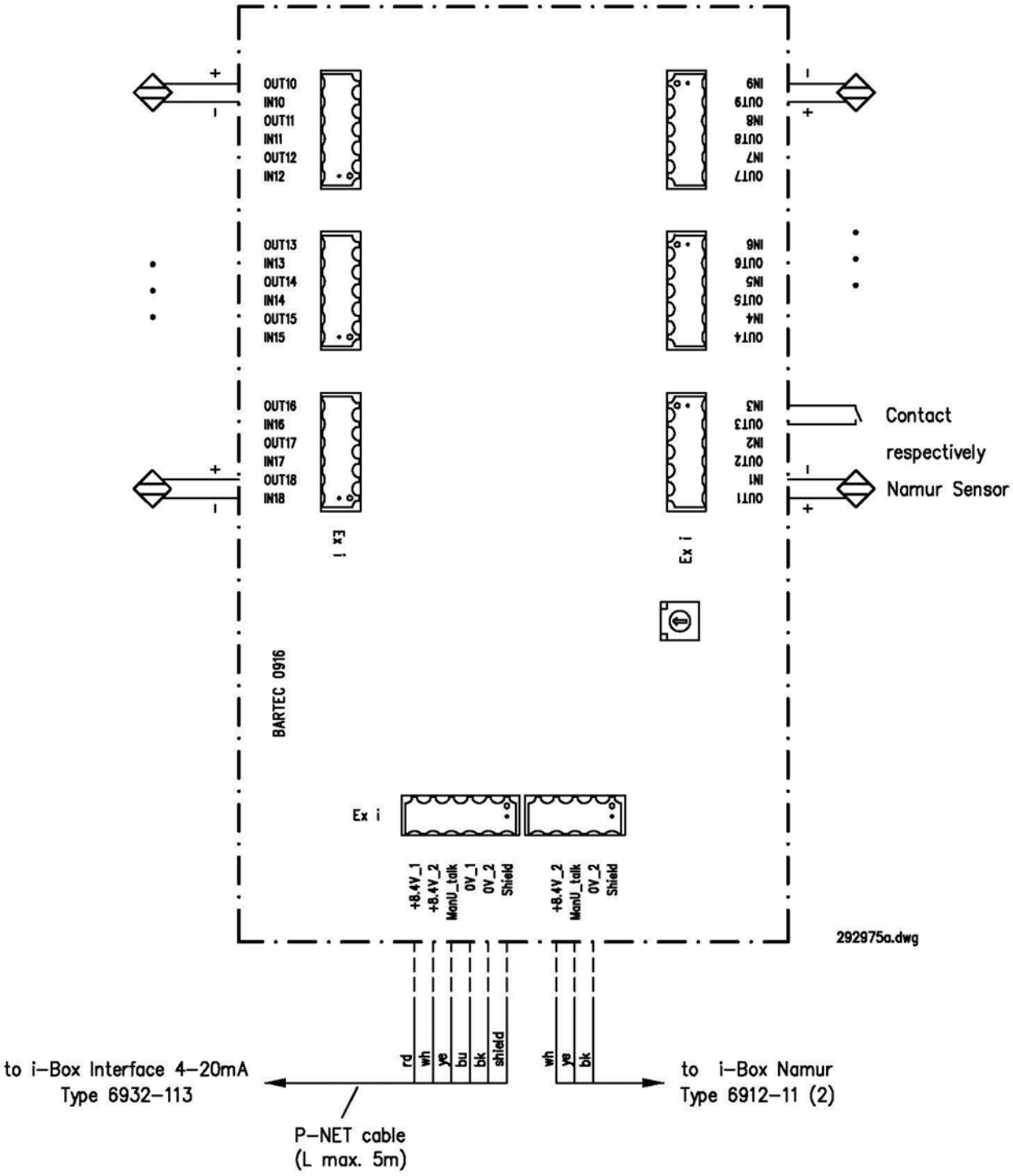


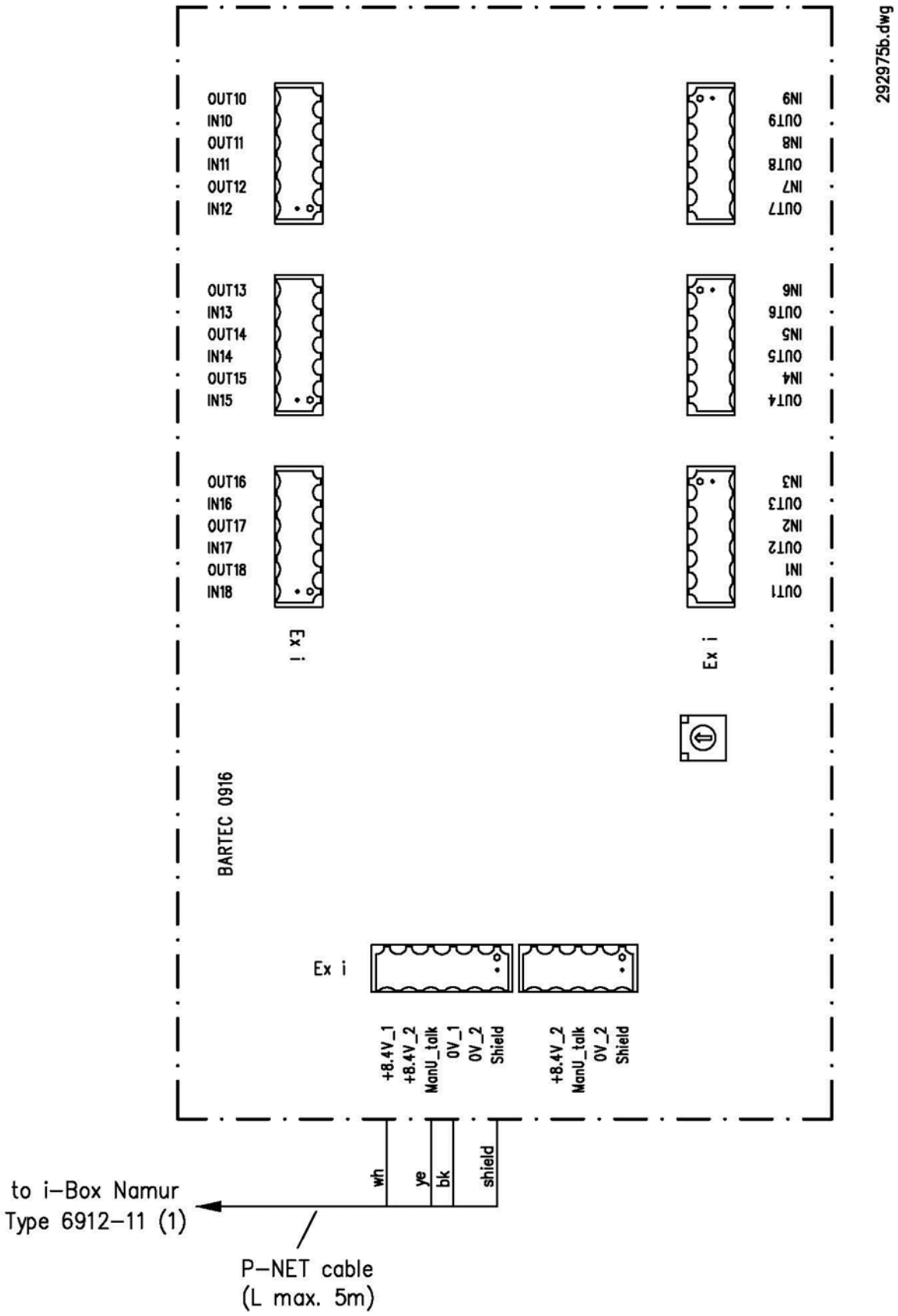

Pay attention to switch position:

Connection to 6932-113 -> Switch position 1

## 7.15.4 Connection to the i-Box 4-20 mA Interface type 6932-113

Connection i-Box Namur 1 to i-Box Interface 4…20 mA type 6932-113 and connection of the interlock sensors.




292975b.dwg
OUT10
IN10
OUT11
IN11
OUT12
IN12
OUT13
IN13
OUT14
IN14
OUT15
IN15
OUT16
IN16
OUT17
IN17
OUT18
IN18
Ex i
IN9
OUT9
IN8
OUT8
IN7
OUT7
IN6
OUT6
IN5
OUT5
IN4
OUT4
IN3
OUT3
IN2
OUT2
IN1
OUT1
Ex i
BARTEC 0916
Ex i
+8.4V_1
+8.4V_2
ManU_talk
0V_1
0V_2
Shield
+8.4V_2
ManU_talk
0V_2
Shield
wh
ye
bk
shield
to i-Box Namur
Type 6912-11 (1)
P-NET cable
(L max. 5m)

### 7.15.5 Functional description immobilizer (Interlock)

The refueling vehicle must be secured against unauthorized movement during refueling. The immobilizer intended for this purpose is activated with the interlock switches (for example Namur sensors) on the vehicle. The sensors are connected to the i-Box Namur (type 6912-11) and con-figured according to their function with the corresponding logical input (for example, logic input 22 - flap on the left). The states of the configured interlock sensors, open, closed, cable break or short circuit, are shown on the display in the interlock window and transmitted via the CAN / J1939 interface. Interlock states received via the CAN / J1939 interface are also displayed in the System 3003. The name in the interlock window corresponds to the name of the logical input in the configuration guide.

If the system 3003 detects an interlock sensor as open or faulty, the logical output 23 is set. With this signal, the immobilizer of the vehicle and the warning light can be coupled. As soon as all interlock sensors are closed, the logical output 23 is reset.

The interlock data, such as the current state and the actuation information, can be transmitted from the system 3003 to the dispatch system.

## 7.16 Temperature sensor Ex G1/2“ type 6702-31

### 7.16.1 Technical data

#### Device-specific data

| | |
|---|---|
| Measuring element | Pt 100 in accordance with DIN IEC 751, class B |
| Measurement range | -30 °C … +100 °C |
| Response time | $t_{90}$ < 15 s |
| Calibration points | at 0 °C and 50 °C |

#### Electrical data

| | |
|---|---|
| Cable connection | 5 m cable, four-wire, shielded, with open ends for connection to evaluation electronics |

#### Ambient Conditions

| | |
|---|---|
| Operating temperature of connecting head | -40 ... +60° C |
| Operating temperature of connecting line | -30 ... +60° C |
| Protection type | IP 65 in accordance with EN 60529 |
| Equipment group/-category Protection type | II 1/2 G Ex ib IIC T6 Ga/Gb |
| Certificates | SEV 13 ATEX 0197<br>IECEx SEV 13.0010 |
| Norms | EN 60079-0, EN 60079-11, EN 60079-26<br>IEC 60079-0, IEC 60079-11, IEC 60079-26 |

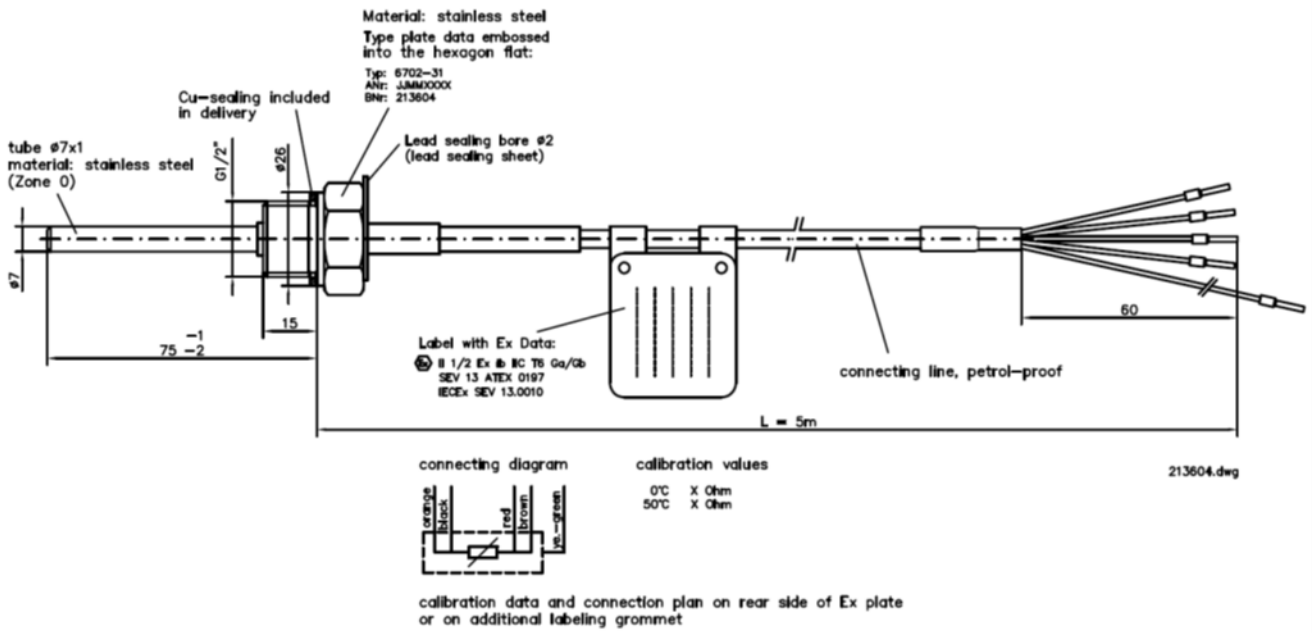
#### Mechanical Data

| | |
|---|---|
| Mounting/casing | Installation with screwing thread G 1/2“ |
| Installation length | 75 mm |
| Installation position | Any |
| Measuring tip | Stainless steel |
| Weight | Approx. 6 N (= 0,6 kg) |

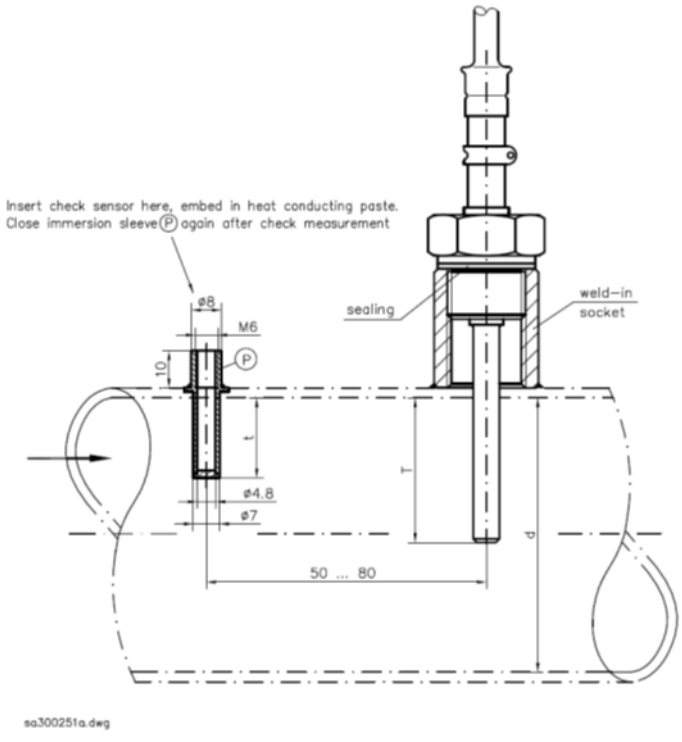
#### Order details

| Designation | Order number |
|---|---|
| Temperature sensor type 6702-31 | 213604 |

## 7.16.2 Dimensions

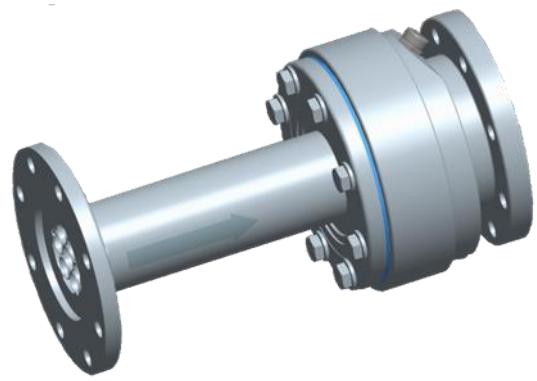



## 7.16.3 Installation instructions




- ▶ Use only zone 1 devices for check measurements at A1 systems!
- ▶ Never use mercury thermometers (high inertia!)

## 7.17 Turbine 1000L/DN50 type 6907-20



### 7.17.1 Technical data

#### Device-specific Data

| | |
|---|---|
| Measuring range | Up to 1000 l/min |
| Accuracy | ≤ 0,5 % (150 l/min – 1000 l/min) |
| Smallest output | 200 l |
| Viscosity range | < 20 mPa*s |
| Pressure range | Max. 10bar |
| Products | Jet fuel |

#### Electrical data

| | |
|---|---|
| Supply voltage/<br>Power consumption | 5 V... 12 V DC / 30 mA<br>5 V DC (from 3/2K-Interface Dual Ex i type 6932-105) |
| Connection | 5 m cable 7 x 0.25 mm² shielded (open end)<br>Shield is not connected inside of the turbine meter<br><br>Colour / Function:<br>Gn – +U<br>Ye – K1<br>Wt – K2<br>Gr – K3<br>Bn – GND<br>Shield – Shield<br><br>Ex-principal: intrinsic safety; detailed electrical data refer to service manual |
| Outputs | Open collector |

#### Ambient Conditions

| | |
|---|---|
| Operating temperature | -25 … +50°C |
| Storage temperature | -25 … +50°C |
| Ambient pressure | 950 … 1050 hPa |
| Equipment group /category /<br>ignition protection class | II 1/2 G Ex ia IIB T4 Ga/Gb |
| Standards | EN 60079-0, EN 60079-11, EN 60079-26 |
| Certificate | Simple apparatus according to EN 60079-11:2012, clause 5.7 |
| Climatic category | IP 66 |

#### Mechanical Data

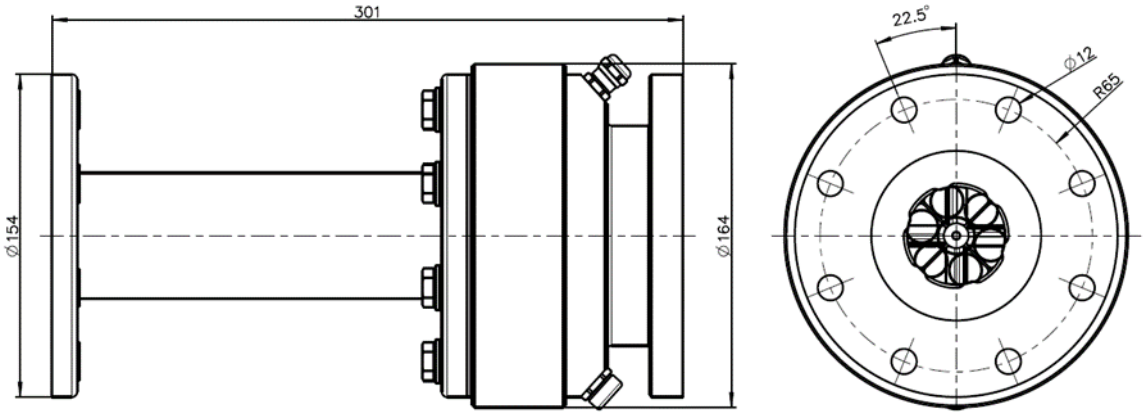
| | |
|---|---|
| Dimensions | See dimensional drawing |
| Weight | Approx. 6.5 kg |

#### Order details

| Designation | Order number |
|---|---|

| | |
|---|---|
| Turbine 1000L/DN50, type 6907-20 | 382584 |
| **Accessories** | |
| Seal DN 50 TW 1, type FD 154/50 | 383162 |

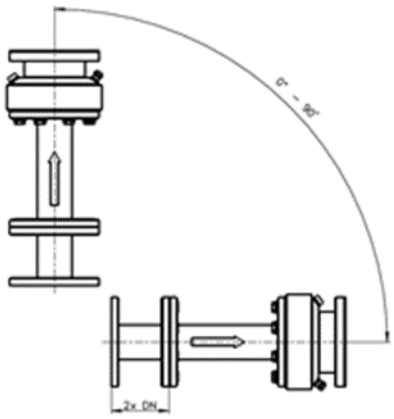
## 7.17.2 Dimensions




## 7.17.3 Electrical connection

See chapter 6.10.5 (Variant 1).

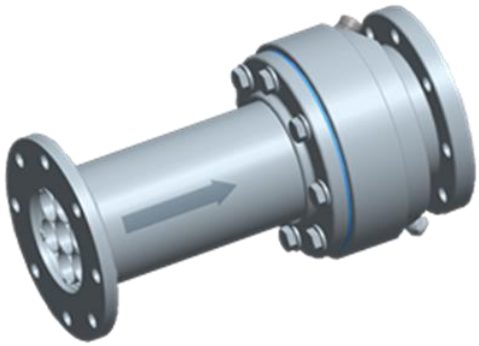
## 7.17.4 Mounting position



### 7.17.5 Safety instructions

- The partition between zone 0 and zone 1 is less than 1 mm in places. There must not be any metallic particles larger than 1.5 mm (greatest diameter or edge length) in order to avoid mechanical damage to the partition and because of the risk of impact and friction sparks in the product stream. A filter of the relevant type with a maximum mesh width of 1.5 mm must be installed.
- The integrated connection cable must either be fitted with light blue shrink sleeving or be marked with the inscription "Ex i" (cf. EN 60079-14:2009 Section 12.2.2.6 and EN 60079-11:2012 Section 12.2. The integrated connection cable must be fixed in position and protected from mechanical damage (cf. EN 60079-14:2009 Section 12.2.2.7).
- The original gaskets must be used for the sealing. The seal must be subjected to a 20 bar pressure test to check for leaks after installation.
- The media pressure must be between 0.8 bar and 1.1 bar in applications with explosive gas mixtures. The nominal pressure must not exceed pN 10 bar in operation without explosive gas mixtures.
- The inside of the turbine, in which the medium is located (gasoline and petroleum products), complies with EPL Ga requirements (Equipment Protection Level), as defined in EN 60079-0:2012 Section 3.26.3 (equipment for use in explosive atmospheres which has a "very high" level of protection and which is not a source of ignition in normal operation, during expected malfunctions or during rare malfunctions).
- Areas outside the turbine comply with EPL Gb requirements (Equipment Protection Level), as defined in EN 60079-0:2012 Section 3.26.4 (equipment for use in explosive atmospheres which has a "high" level of protection and which is not a source of ignition in normal operation or during expected malfunctions).
- The turbine is only approved for heating oil (EL), diesel and gasoline (including fuels containing ethanol). If using additives, it is necessary for the user to check the chemical resistance to the additives.
- The following non-metallic sealing materials and metals are used:
- NBR webbing, ELAPAC-FD (Elaflex) (seal between pipe bundle flow straightener and turbine section)
- Aluminium

# 7.18 Turbine 2000L/DN80 type 6907-21



## 7.18.1 Technical data

### Product data

| | |
|---|---|
| Measuring range | Up to 2000 l/min |
| Accuracy | ≤ 0.5 % |
| Viscosity range | < 20 mPa*s |
| Pressure range | Max. 10bar |
| Products | Jet fuel |

### Electrical data

| | |
|---|---|
| Supply voltage / Power consumption | 5 V... 12 V DC / 30 mA<br>5 V DC (from 3/2K-Interface Dual Ex i Typ 6932-105) |
| Connection | 5 m cable 7 x 0.25 mm² shielded (open end)<br>Shield is not connected inside of the turbine meter<br><br>Colour / Function:<br>gn – +U<br>ye – K1<br>wt – K2<br>gr – K3<br>bn – GND<br>Shield – Shield<br><br>Ex-principal: intrinsic safety; detailed electrical data refer to service manual |
| Outputs | Open collector |

### Ambient Conditions

| | |
|---|---|
| Operating temperature | -25 … +50°C |
| Storage temperature | -25 … +50°C |
| Fluid pressure | 950 … 1050 hPa |
| Equipment group /category / ignition protection class | II 1/2 G  Ex ia IIB T4 Ga/Gb |
| Standards | EN 60079-0, EN 60079-11, EN 60079-26 |
| Certificate | Simple apparatus according to EN 60079-11:2012, clause 5.7 |
| Climatic category | IP 66 |

### Mechanical Data

| | |
|---|---|
| Dimensions | See dimensional drawing |
| Weight | Approx. 7.5 kg |

### Order details

| Designation | Order number |
|---|---|
| Turbine meter DN80, Type 6907-21 | 382586 |

## 7.19 Turbine 4000L/DN100 type 6907-22

### 7.19.1 Technical data

#### Device-specific Data

| | |
|---|---|
| Measuring range | max. 4000 l/min |
| Accuracy | ≤ 0,5 % (400 l/min - 4000 l/min) |
| Smallest output | 500 l |
| Viscosity range | < 20 mPa*s |
| Pressure range | Max. 10bar |
| Products | Jet fuel |

#### Electrical data

| | |
|---|---|
| Supply voltage/<br>Power consumption | 5 V... 12 V DC / 30 mA<br>5 V DC (from 3/2K-Interface Dual Ex i type 6932-105) |
| Connection | 5 m cable 7 x 0.25 mm² shielded (open end)<br>Shield is not connected inside of the turbine meter |

| Colour | Function |
|---|---|
| gn | +U |
| ye | K1 |
| wt | K2 |
| gr | K3 |
| bn | GND |
| Shield | Shield |

Ex-principal: intrinsic safety; detailed electrical data refer to service manual

| | |
|---|---|
| Outputs | Open collector |

#### Ambient Conditions

| | |
|---|---|
| Operating temperature | -25 … +50°C |
| Storage temperature | -25 … +50°C |
| Ambient pressure | 950 … 1050 hPa |
| Equipment group /category /<br>ignition protection class | II 1/2 G Ex ia IIB T4 Ga/Gb |
| Standards | EN 60079-0, EN 60079-11, EN 60079-26 |
| Certificate | Simple apparatus according to EN 60079-11:2012, clause 5.7 |
| Climatic category | IP 66 |

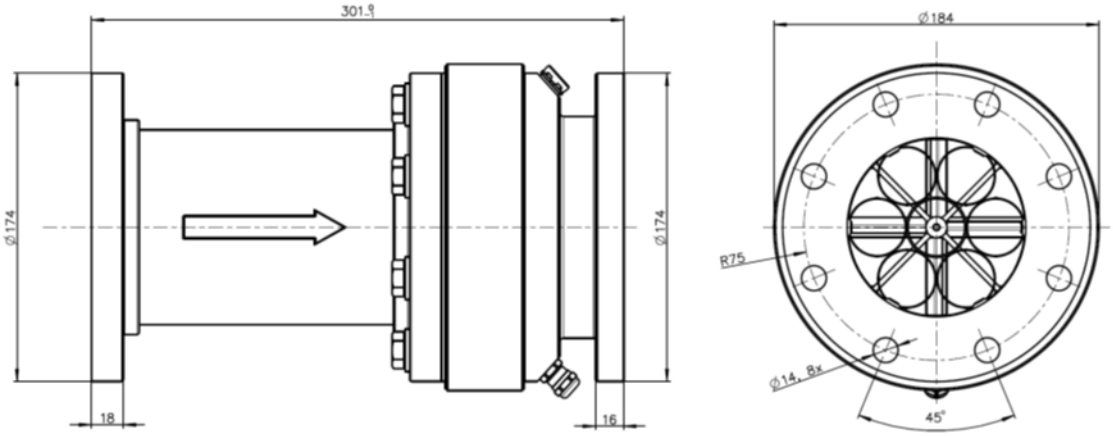
#### Mechanical Data

| | |
|---|---|
| Dimensions | See dimensional drawing |
| Weight | Approx. 8 kg |

#### Order details

| Designation | Order number |
|---|---|
| Turbine 4000L/DN100, type 6907-22 | 365333 |
| **Accessories** | |
| Seal DN 100 TW 3, type FD 174 | 365386 |

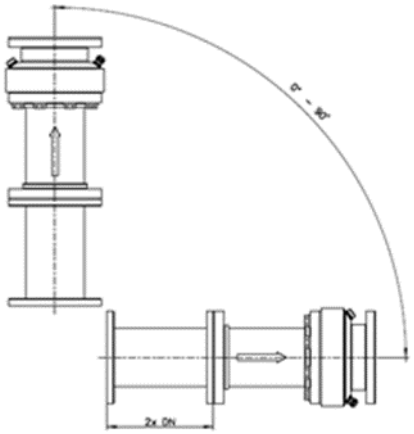
## 7.19.2 Dimensions




## 7.19.3 Electrical connection

Look chapter 6.10.5 (Variant 1).

## 7.19.4 Mounting position



### 7.19.5 Safety instructions

- The partition between zone 0 and zone 1 is less than 1 mm in places. There must not be any metallic particles larger than 1.5 mm (greatest diameter or edge length) in order to avoid mechanical damage to the partition and because of the risk of impact and friction sparks in the product stream. A filter of the relevant type with a maximum mesh width of 1.5 mm must be installed.
- The integrated connection cable must either be fitted with light blue shrink sleeving or be marked with the inscription "Ex i" (cf. EN 60079-14:2009 Section 12.2.2.6 and EN 60079-11:2012 Section 12.2. The integrated connection cable must be fixed in position and protected from mechanical damage (cf. EN 60079-14:2009 Section 12.2.2.7).
- The original gaskets must be used for the sealing. The seal must be subjected to a 20 bar pressure test to check for leaks after installation.
- The media pressure must be between 0.8 bar and 1.1 bar in applications with explosive gas mixtures. The nominal pressure must not exceed pN 10 bar in operation without explosive gas mixtures.
- The inside of the turbine, in which the medium is located (gasoline and petroleum products), complies with EPL Ga requirements (Equipment Protection Level), as defined in EN 60079-0:2012 Section 3.26.3 (equipment for use in explosive atmospheres which has a "very high" level of protection and which is not a source of ignition in normal operation, during expected malfunctions or during rare malfunctions).
- Areas outside the turbine comply with EPL Gb requirements (Equipment Protection Level), as defined in EN 60079-0:2012 Section 3.26.4 (equipment for use in explosive atmospheres which has a "high" level of protection and which is not a source of ignition in normal operation or during expected malfunctions).
- The turbine is only approved for heating oil (EL), diesel and gasoline (including fuels containing ethanol). If using additives, it is necessary for the user to check the chemical resistance to the additives.
- The following non-metallic sealing materials and metals are used:
- NBR webbing, ELAPAC-FD (Elaflex) (seal between pipe bundle flow straightener and turbine section)
- Aluminium

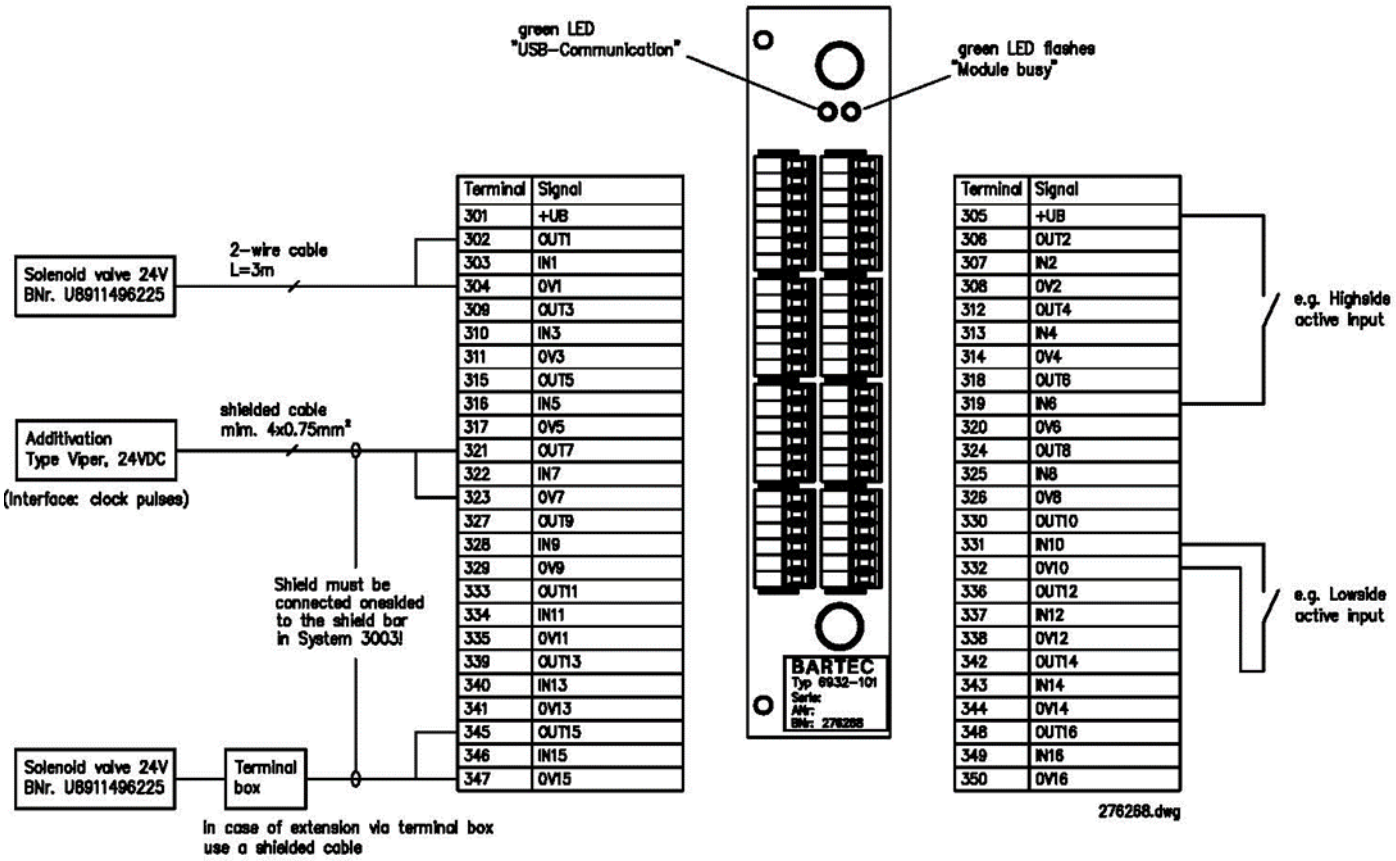
# 7.20 Additive addition Type: Viper

Manufacturer: GAMMONTECH

(DC 24 V, air-controlled via solenoid valve)

The Ex licence of the relevant unit manufactured by a third party must be checked with regard to installation and operation in the hazard areas or connection to the BARTEC system!

| Terminals I/O-16<br>type 6932-101 | Outputs<br>general | Solenoid valve<br>(U891496225) | Viper addition, 24V<br>Interface:<br>Clock pulses/air controlled |
|---|---|---|---|
| 3xx (out_x) | +24V stab. switching | bn | bk |
| 3xx (0V_x) | 0V sink | bl | bk |
| | | | (gn isolating) |


green LED
"USB-Communication"
green LED flashes
"Module busy"
Terminal
Signal
301 +UB
302 OUT1
303 IN1
304 0V1
309 OUT3
310 IN3
311 0V3
315 OUT5
316 IN5
317 0V5
321 OUT7
322 IN7
323 0V7
327 OUT9
328 IN9
329 0V9
333 OUT11
334 IN11
335 0V11
339 OUT13
340 IN13
341 0V13
345 OUT15
346 IN15
347 0V15
305 +UB
306 OUT2
307 IN2
308 0V2
312 OUT4
313 IN4
314 0V4
318 OUT6
319 IN6
320 0V6
324 OUT8
325 IN8
326 0V8
330 OUT10
331 IN10
332 0V10
336 OUT12
337 IN12
338 0V12
342 OUT14
343 IN14
344 0V14
348 OUT16
349 IN16
350 0V16
e.g. Highside
active input
e.g. Lowside
active input
BARTEC
Typ 6932-101
Solenoid valve 24V
BNr. U8911496225
2-wire cable
L=3m
Additivation
Type Viper, 24VDC
(Interface: clock pulses)
shielded cable
min. 4x0.75mm²
Shield must be
connected onesided
to the shield bar
in System 3003!
Solenoid valve 24V
BNr. U8911496225
Terminal
box
In case of extension via terminal box
use a shielded cable
276268.dwg

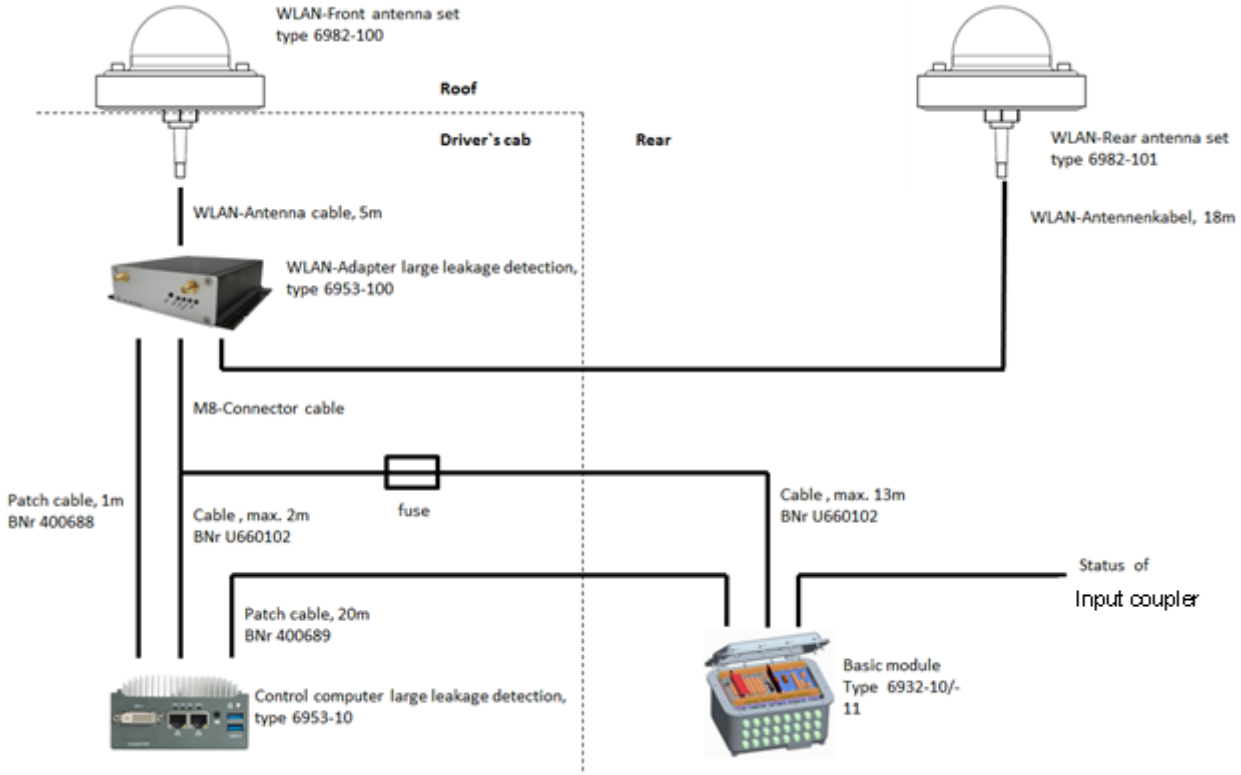
# 7.21 Dynamic large leakage detection

Dynamic large leakage detection is a special system used to detect leakages in an airport hydrant system. The connection of the refueling vehicles to the GLE system is realized via a WLAN network.

The data exchange between the refueling vehicles and the GLE system takes place via an OPC server (OPC DA version 2.0).

The procedure and data exchange on the vehicle side has been implemented in accordance with the manual "Dynamic large leakage detection GLE Version 2.0 - Vehicle interface" of 24.11.2015 (M + F Technologies GmbH).

## 7.21.1 Block diagram




## 7.21.2 WLAN-Adapter large leakage detection, type 6953-100

The WLAN adapter large leakage detection (GLE) allows the control computer GLE the wireless communication with the GLE-Server

### 7.21.2.1 Technical data

#### Specific Data

| | | |
|---|---|---|
| Voltage supply | 10-72VDC (galvanically isolated) | |
| Energy consumption | <=5W (3W typical) | |
| Wireless standards | 802.11 b/g WLAN (2.4GHz Band) | |
| Encoding | WEP (64,128bit) + TKIP/AES | |
| Security | 802.11i WPA(2) – PSK<br>802.1x EAP-PEAP, -TLS, -TTLS, -LEAP | |
| Channels | 802.11b/g ETSI 1-13, USA/Canada 1-11 | |
| Data rates | 802.11b | 1, 2, 5.5, 11Mbps |
| | 802.11g | 6, 9, 12, 18, 24, 36, 48, 54Mbps |
| Transmission power | 802.11b/g 17 dBm | |
| Ethernet | 4 x 10/100/1000 MBit Auto MDI/MDIX | |

#### Connections

| | |
|---|---|
| Voltage | M8 round connector, 3-pole |
| Ethernet | 4x RJ45-socket |
| Antenna | 2x RP-SMA-socket |
| USB | 1x USB 2.0 socket |

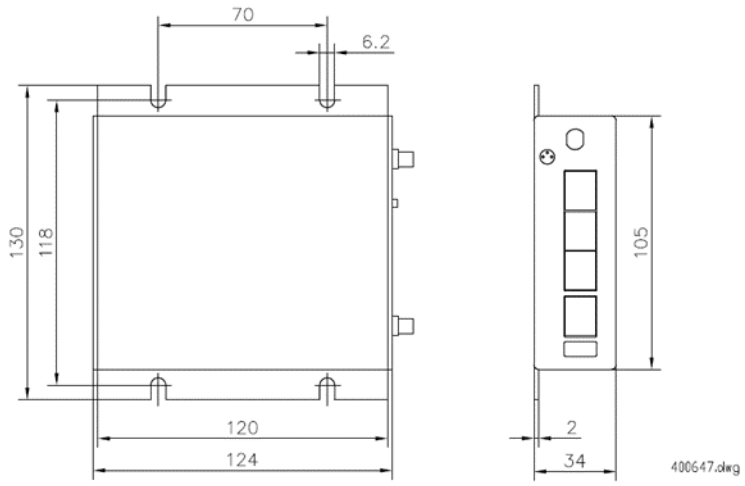
#### Ambient Conditions

| | |
|---|---|
| Operation temperature | 0 - 60°C |

#### Mechanical Data

| | |
|---|---|
| Mounting method | Mounting brackets |
| Weight | ca. 400g |

Dimensions




## Order details

| Designation | Order number |
|---|---|
| WLAN-Adapter large leakage detection,<br>type 6953-100, inclusive M8-connection cable, 2m | 401899 |
| Patch cable, 1m | 400688 |

### 7.21.2.2 Mounting

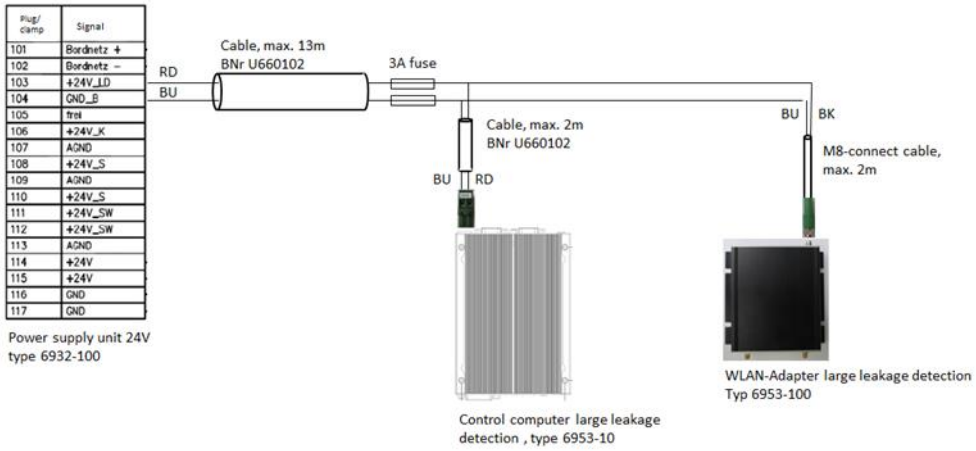
The WLAN adapter large leakage detection will be mounted to the back of the cab by using of the mounting lugs. It must be planned that the area before the WLAN-Adapter is free for the connections (minimum 60mm).

The WLAN-adapter may not be installed and operated in explosive areas.

### 7.21.2.3 Power supply

The WLAN adapter large leakage detection is supplied with the +24V_LD from the basic module. For this purpose, the cable (BNr U660102) from the basic module is placed in the drivers cab.

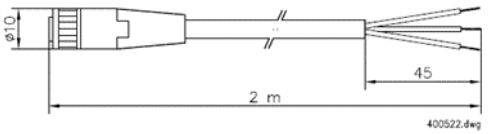
The supply and return lines must each be protected with an 3A fuse.



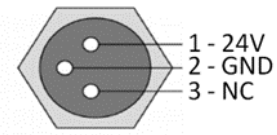

| Power supply unit 24V,<br>type 6932-100 | Cable,<br>BNr U660102 | M8-Connect cable |
|---|---|---|
| +24V_LD | Red (RD) | Black (BK) |
| GND_B | Blue (BU) | Blue(BU) |

**M8-Connection cable**

| Signal | Cable | Pin |
|---|---|---|
| +24V | Black | 1 |
| GND | Blue | 2 |
| NC | Brown | 3 |

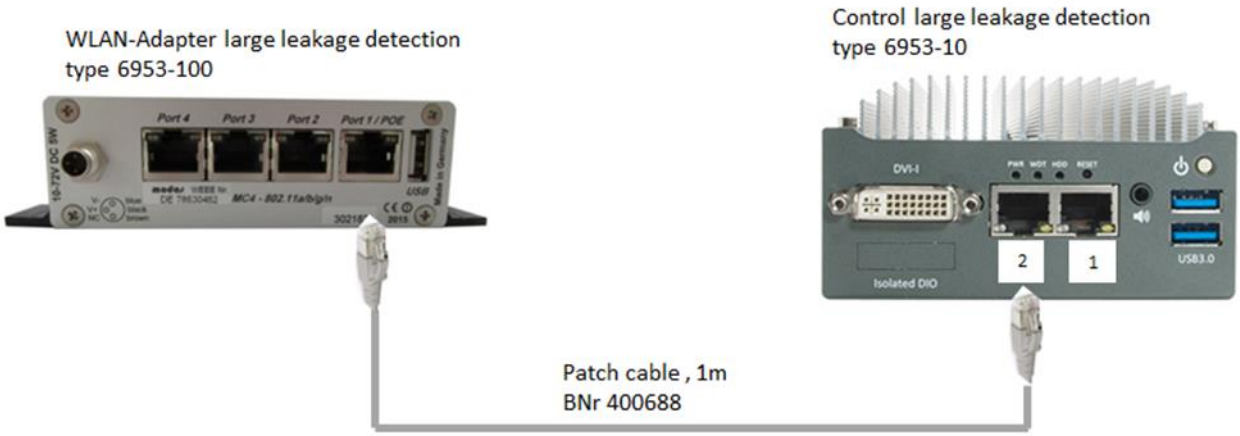



**M8-Connection cable pin assignment**



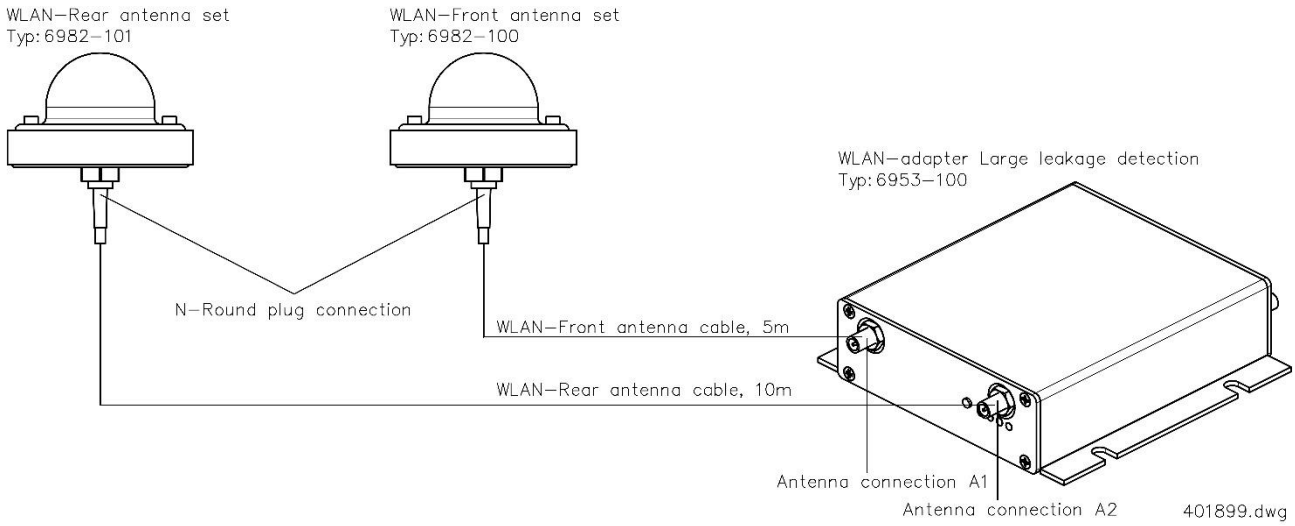
### 7.21.2.4 Connection type 6953-100, type 6982-100/101

The port 1 / POE of the WLAN adapter large leakage detection is connected by means of a patch cable to the LAN jack 2 of the control computer large leakage detection.




Do not connect other LAN-participant to the WLAN-Adapter

The front aerial is connected to the WLAN adapter at connection A1 and the rear aerial at connection A2.



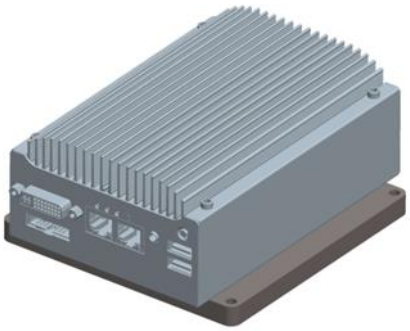

| WARNING! | |
|---|---|
| | The WLAN antenna cables must not be extended. |

### 7.21.2.5 LED-display


The 4 LEDs, WLAN, LAN, SER and ON on the front side indicate the operating status of the WLAN adapter. All four LEDs light up briefly after switching on or after a reset. When a firmware update or a new configuration is made, the WLAN + LAN + SER LEDs flashed up blue.

| LED | Status | Function |
|---|---|---|
| ON | Off | No or insufficient supply voltage |
| | Green | Supply voltage connected |
| | Green/yellow blinking | Normal mode |
| WLAN | OFF | WLAN option switched off |
| | Red blinking | WLAN-Adapter search for a matching access points or will be authenticated |
| | Green | WLAN-Connection OK<br>Short red light indicates activity (send or receive) on the interface |
| LAN | OFF | Control computer not connected |
| | Green | Control computer is available and switched on<br>Short red light indicates activity on the interface |

## 7.21.3 Control computer large leakage detection, type 6953-10



The control computer is the link between the GLE server and the measuring system FFB 3003. The control computer takes the needed data from the measuring system FFB 3003 over a TCP / IP connection counter and provides them to the GLE server.

As soon as the control computer GLE is supplied with voltage, it must be shut down properly with the system 3003.

The control computer GLE must be connected to the system 3003 and the large leakage detection must be activated in the system 3003.

For service purposes, a USB mouse, a USB keyboard and a monitor with DVI connection is required. Alternatively, a monitor with VGA connector and DVI-VGA adapter can be used.

### 7.21.3.1 Technical data

#### Specific Data

| | |
|---|---|
| Voltage supply | 8 - 35VDC |
| Power consumption | Typical: 7.68W (0,32A@24V)<br>Full load 13.44W (0,56A@24V) |
| Processor | Intel® Atom™ E3845 1.91 GHz quad-core |
| Random access memory | 4GB |
| Memory | 2.5“ SATA SSD 128GByte |
| Ethernet | 2x Gigabit Ethernet by Intel® I210 GbE controller |
| Serial | 2x RS-232/422/485 (COM1 & COM3)<br>2x RS-232 (COM2 & COM4) |
| USB | 3x USB 3.0<br>1x USB 2.0 |
| Video | Analog RGB und DVI/HDMI, Max. resolution 2560x1600 |
| Audio | 1x Loudspeaker output |
| DIO | 4x DI, 5V, TTL<br>4x DO, 5V, TTL |

#### Connections

| | |
|---|---|
| Voltage | Terminal strip, 2-pole, pluggable |
| Ethernet | 2x RJ45-socket |
| Serial | 4x D-Sub plug, 9-pole |
| Video | 1x DVI-I socket |
| USB | 4x USB-socket, type A |
| Audio | 1x Jack socket |
| DIO | 1x Tub connector, 16-pole |

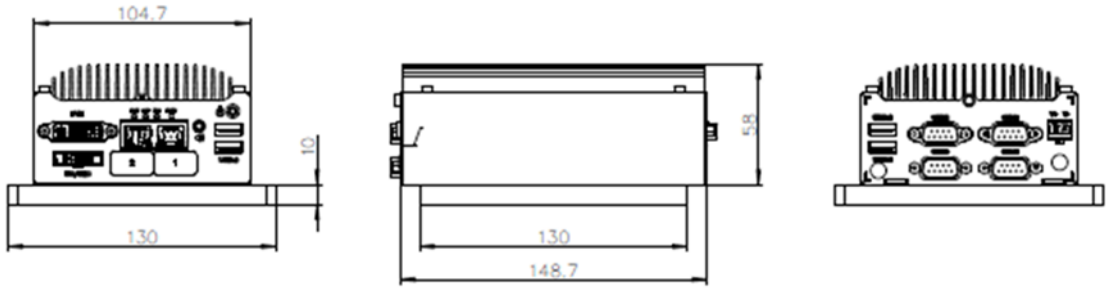
#### Ambient Conditions

| | |
|---|---|
| Operation temperature | -25°C … +70°C |
| Storage temperature | -40°C … +85°C |

#### Mechanical Data

| | |
|---|---|
| Mounting method | Wall mounting |
| Weight | 1.3kg |

Dimensions

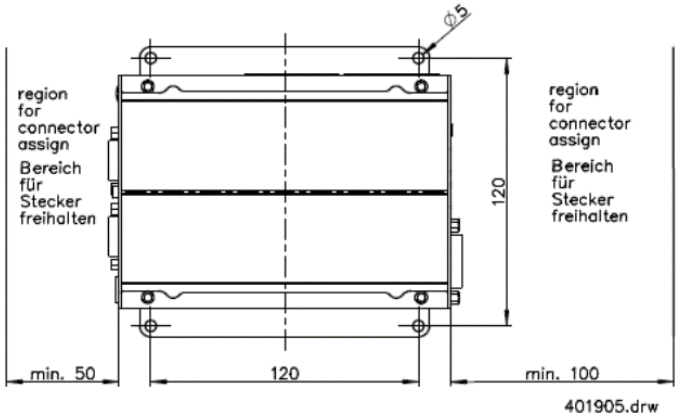



### Order details

| Designation | Order number |
|---|---|
| Control computer large leakage detection, type 6953-10 | 401905 |
| Patch cable, 20m | 400689 |
| Plug RJ45 | 400715 |
| Crimping tool | 401906 |
| Network cable tester | 401907 |
| Cable, voltage supply | U660102 |

### 7.21.3.2 Mounting

The control computer is mounted with in order to a mounting plate insulate the control computer from the chassis. The four corner bores on the mounting plate serve as mounting points.



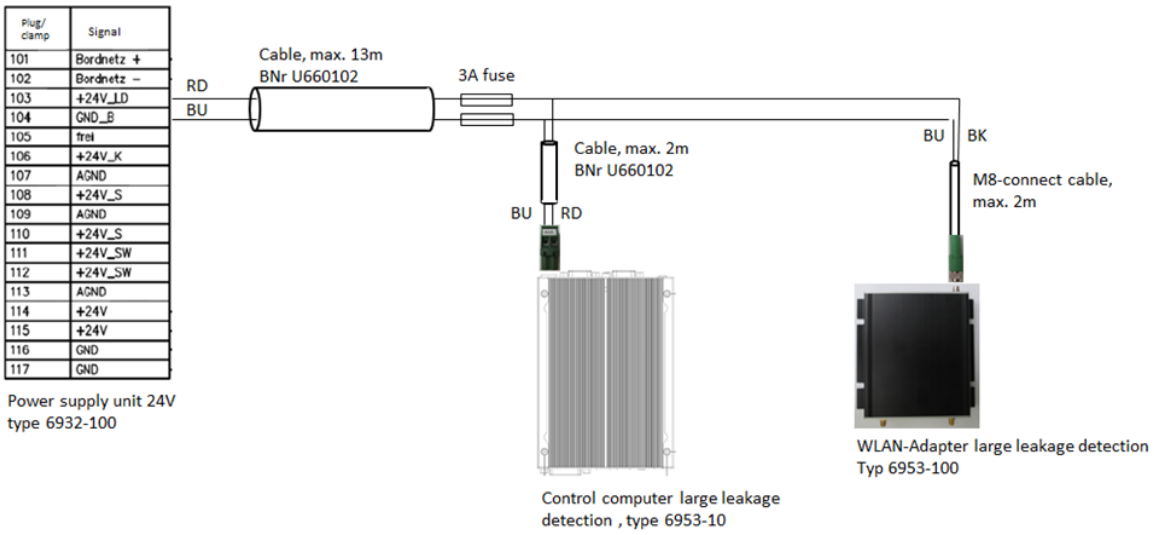

The mounting plate must not be removed.

Insert a free area for the connectors in front of the connections of the control computer.

The control computer may not be installed and operated in explosive areas.

### 7.21.3.3 Power supply

The control computer large leakage detection is supplied with the +24V_LD from the basic module. For this purpose, the cable (BNr U660102) from the basic module is placed in the driver's cab. The supply and return lines must each be protected with an 3A fuse.



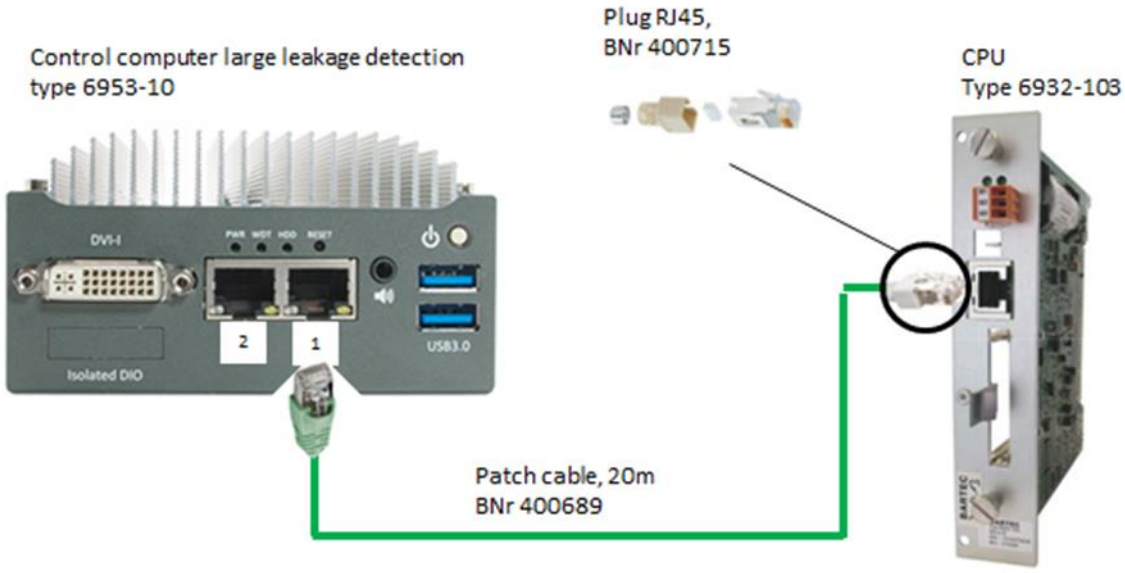

| Power supply unit 24V, type 6932-100 | Cable, BNr U660102 | Control computer large leakage detection, type 6953-10 |
|---|---|---|
| +24V_LD | Red (RD) | V+ |
| GND_B | Blue (BU) | V- |

As soon as the control computer GLE is supplied with voltage, it must be shut down properly with the system 3003.

The control computer GLE must be connected to the system 3003 and the large leakage detection must be activated in the system 3003.

### 7.21.3.4 Connections

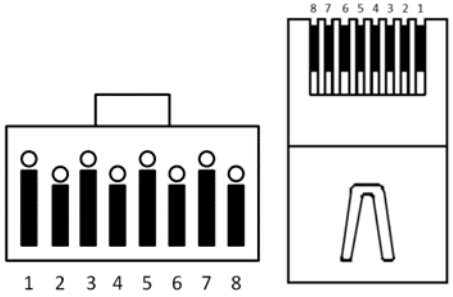
Use a patch cable to connect the control computer large leakage detection with the CPU type 6932-103. For this purpose, the prefabricated RJ45 plug of the patch cable is removed on the CPU side, so that the patch cable can be inserted into the basic module via the cable gland. The RJ45 connector is crimped (crossover) to the open end of the patch cable and connected to the RJ45 socket of the CPU type 6932-103. The prefabricated RJ45 plug is connected to the RJ45 socket on the control computer side.




The patch cables must not be extended.

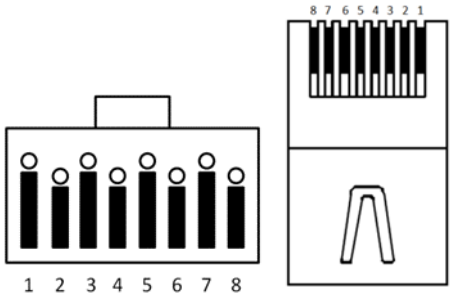
Insert the patch cable into the cable gland before assembling.

**Pin assignment plug RJ45 (BNr 400715) (Cross Over)**




| PIN | Colour |
|---|---|
| 1 | white, green |
| 2 | green |
| 3 | white, orange |
| 4 | white, brown |
| 5 | brown |
| 6 | orange |
| 7 | blue |
| 8 | white, blue |

**Pin assignment preassembled plug on patch cable (BNr. 400689)**




| PIN | Colour |
|---|---|
| 1 | white, orange |
| 2 | orange |
| 3 | white, green |
| 4 | blue |
| 5 | white, blue |
| 6 | green |
| 7 | white, brown |
| 8 | brown |

**Pin assignment for patch cables**

| preassembled plug<br>(BNr 400689) | Plug RJ45<br>(BNr 400715) |
|---|---|
| 1 | 3 |
| 2 | 6 |
| 3 | 1 |
| 4 | 7 |
| 5 | 8 |
| 6 | 2 |
| 7 | 4 |
| 8 | 5 |

With the network cable tester (BNr 401907) the above pin assignment can be checked.

**LEDdisplay**


| LED | State | Description |
|---|---|---|
| PWR | OFF | System is off, no power supply connected. |
| | Green | System is on. |
| HDD | OFF | Hard drive is not active yet. |
| | Red flashing | Hard drive is active. |

## 7.21.4 Input „Input coupler / AmPIT”

The GLE system requires the information "vehicle at the hydrant" or "at the PIT". This information is obtained from the position of the input coupler.

If the position signal of the input coupler is available as a Namur signal, it is applied to a free input of the i-Box Namur, type 6912-11.

See chapter "i-Box Namur Type 6912-11".

If the position signal is generated by a switch or relay, it is possible to apply this potential-free to a free digital input on the I / O 16 Ex e inter-face of the FFB 3003 measuring system.

See chapter "I/O-16 Ex e Interface Type 6932-101".

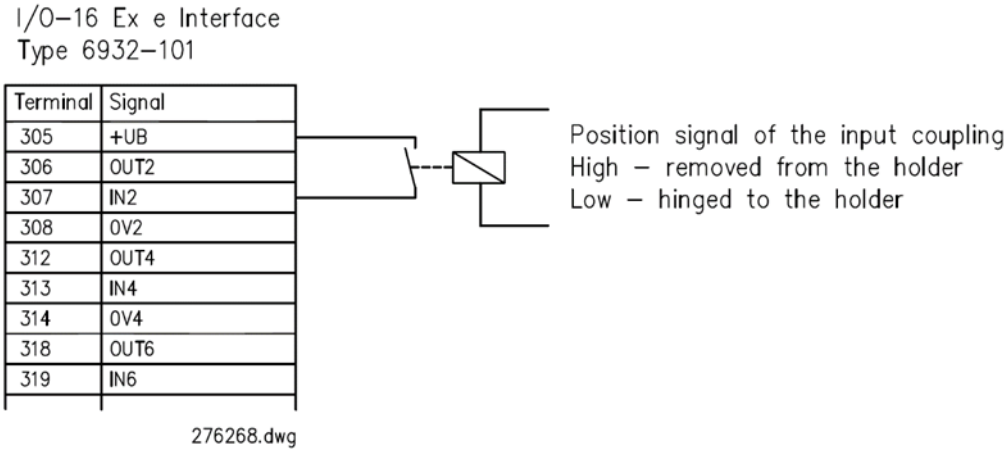
The components to be connected and their interconnection must be suit-able for use in the respective hazardous area and zone.

If the position of the input coupler is only used for the GLE status infor-mation, the physically used input must be configured in the software with the logical number 2.

If the position of the input coupler is also used as an interlock function, the physically used input must be configured in the software with the log-ical number 42.

| Status of GLE-System | Status of input coupler | Input signal INx |
|---|---|---|
| Vehicle not on PIT | Input coupler is in the vehicle holder | Low |
| Vehicle on PIT | Input coupler is not in the vehicle holder | High |

The following is a connection example for the input „input cou-pler/AmPIT”




Observe the safety instructions of the I/O 16 Ex e Interface.

Configure the physical input in the configuration menu of the FFB 3003 measuring system with the corresponding logical number (2/42).

# 7.22 WLAN-Roof/Rear antenna set, type 6982-100/101

The on the vehicle roof and rear mounted omnidirectional antenna is used to ensure the wireless connection.

## 7.22.1 Technical data

### Specific Data

| | |
|---|---|
| Frequency | 2400-4900MHz<br>4900-6000MHz |
| VSWR<br>2400-4900MHz<br>4900-6000MHz | <br>1.7<br>1.7 |
| Gain<br>2400-4900MHz<br>4900-6000MHz | <br>4dB<br>6.5dBi |
| Dispersion angle | 360° |
| Polarisation | vertical |
| DC grounding | no |
| Power max. | 10W @ 25°C (ambient temperature) |

### Connections

| | |
|---|---|
| Antenna | N, jack (female) |

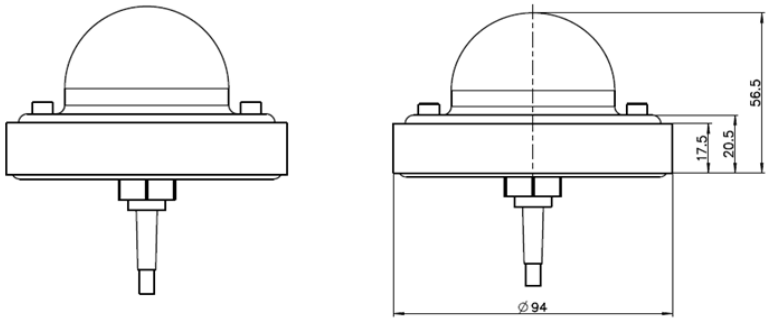
### Ambient Conditions

| | |
|---|---|
| Operation temperature | -40 … 80°C |
| Storage temperature | -40 … 80°C |

### Mechanical Data

| | |
|---|---|
| Weight | 300g |

Dimensions

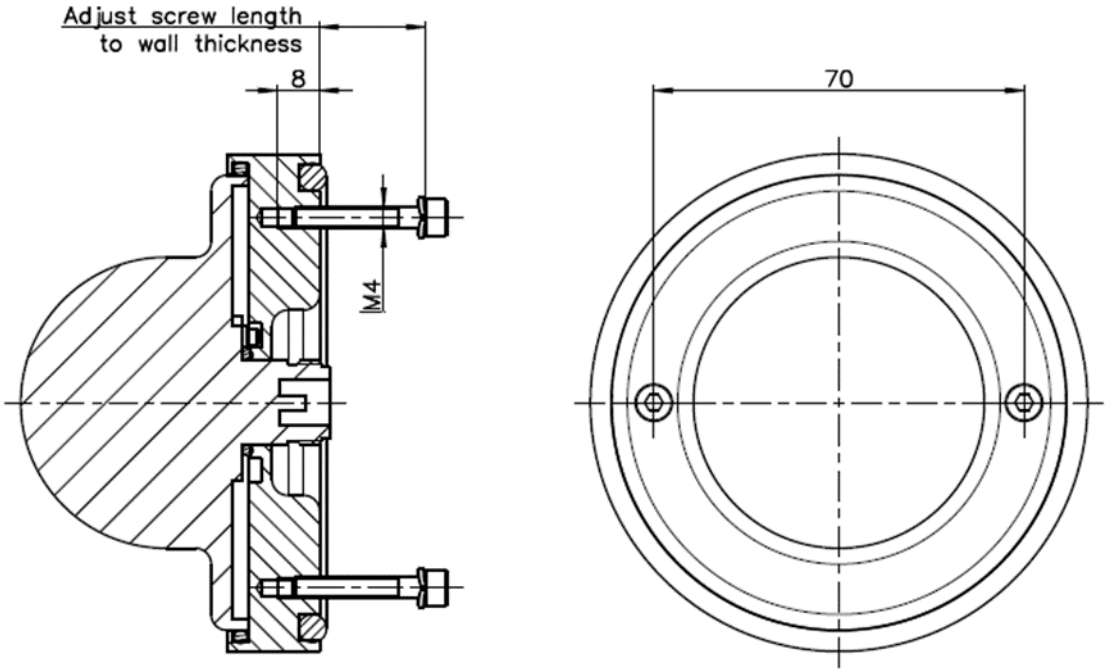



### Order details

| Designation | Order number |
|---|---|
| WLAN-Roof antenna set, type 6982-100,<br>incl. 5m antenna connection cable | 400522 |
| WLAN-Rear antenna set, type 6982-101,<br>incl. 18m antenna connection cable | 400523 |

## 7.22.2 Mounting

The WLAN antennas are attached to the roof of the driver's cab or to the rear of the vehicle using M4 mounting screws. If a rear position is not possible, the rear aerial can be positioned at a distance of 5m diagonally to the front aerial. When positioning the WLAN antennas, it is essential to ensure a free field of view without shielding. It must be used a stable and flat mounting surface for the wireless antennas.



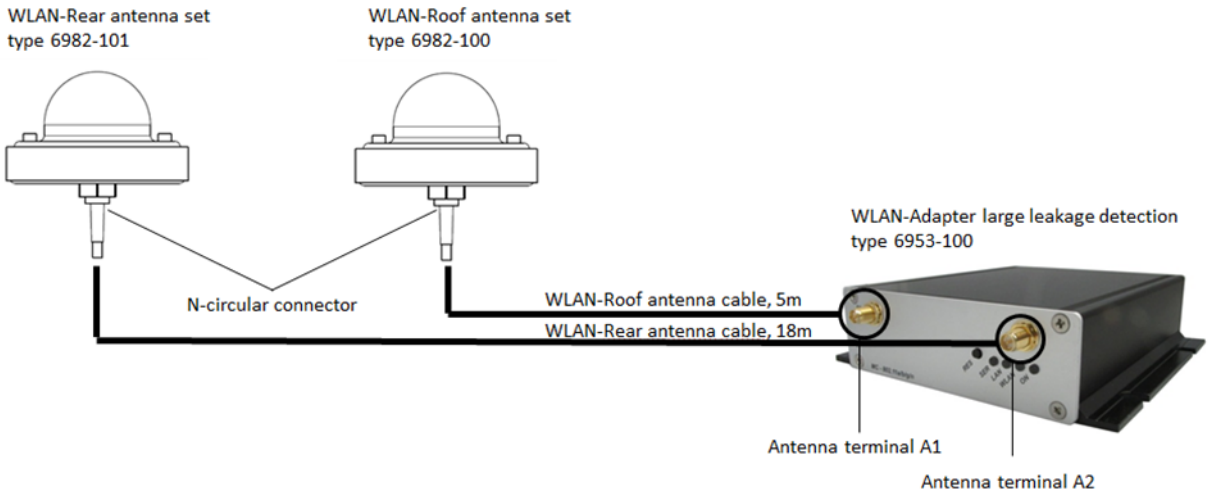

Use a stable and level mounting base. If necessary, seal leaks with silicone.

Mounting screws not included.

The WLAN antennas may not be installed and operated in explosive areas.

## 7.22.3 Connection

The front antenna is connected to the WLAN adapter at port A1 and the rear antenna at port A2.

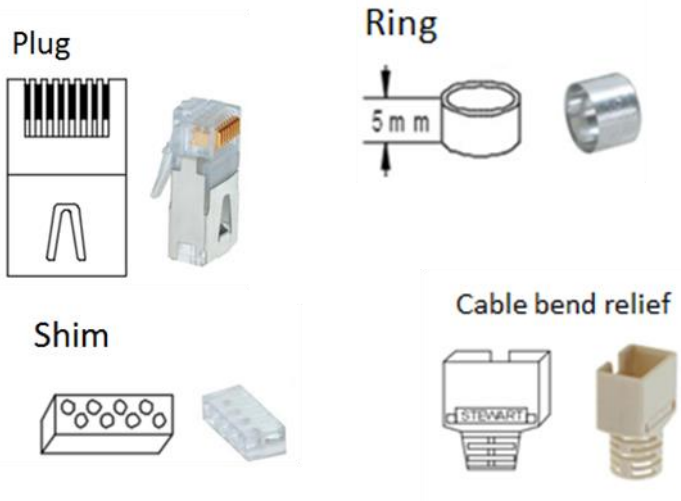



The WLAN cables must not be extended..

# 7.23 Assembly RJ45 Plug

(order number: 400715)

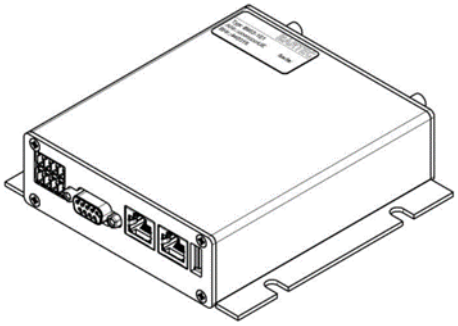
## 7.23.1 Components




## 7.23.2 Crimp instruction

- Slide the cable bend relief onto the patch cable.
- Strip the insulation of the patch cable for 25mm.
- Lay the shield backwards over the sheath and shorten it by 5mm (as long, as the ring is high).
- Slide the ring over the shield/ sheath, so that the narrowed side directly abuts the sheath.
- Insert the wires according to the pin assignment (see pin assignment plug RJ45 (BNr 400715)) into the management bar. Wires should be as smooth as possible next to each other.
- Press the ring with a crimping tool (BNr 401906).
- Shorten the wires so that they touch the connector casing when the ring has completely disappeared into the plug. (Wires length ca. 15mm)
- Slide the management bar to the beginning of the wire.
- Overlay the plug so far that the wires slide into the provided notch of the plug.
- Check that all wires are in their intended position and then press the plugs with the crimping tool (BNr 401906).
- Overlay the bend relief. The recess of the bend relief, have to be on the same side where the clip of the plug is. The sheet metal of the plug must not move when the cable blend relief pushed on. Blend relief click into place.

## 7.24 WLAN adapter, type 6953-101



- The WLAN adapter, type 6953-101, enables the System 3003 to establish a connection to a WLAN network/access point.
- The WLAN adapter must not be in-stalled and operated in potentially explosive atmospheres.

### 7.24.1 Technical data

#### Specific Data

| | | |
|---|---|---|
| Wireless standards | 802.11 a/b/g/n WLAN 2.4 + 5GHz Band | |
| Encoding | WPA/WPA2 (TKIP/AES) | |
| Security | 802.11i WPA(2) – PSK | |
| Channels | 802.11b/g/n ETSI 1-13, USA/Canada 1-11<br>802.11a/n ETSI 19, USA/Canada 25 (U-NII-1 + UNII-2A + U-NII-2C+U-NII-3) | |
| Data rate | 802.11b | 1, 2, 5.5, 11Mbps |
| | 802.11g/a | 6, 9, 12, 18, 24, 36, 48, 54Mbps |
| | 802.11n (20MHz) | 1Nss: max. 72.2Mbps<br>2Nss: max. 144.4Mbps |
| | 802.11n (40MHz) | 1Nss: max. 150Mbps<br>2Nss: max. 300Mbps |
| Transmission power | 802.11b/g | 17 dBm |
| | 802.11gn | 16 dBm |
| | 802.11a | 15 dbm |
| | 802.11an | 15 dbm |

#### Electrical data

| | |
|---|---|
| Operating voltage | 10 – 60VDC (galvanically isolated) |
| Power supply | <=5W (3W typical) |
| Ethernet | 2 x 10/100/1000 MBit Auto MDI/MDIX |
| Serial | 1 x RS232, 300-460,8 KBit/s, RTS, CTS, DSR, DTR |
| USB | 1 x USB 2.0 |

#### Connections

| | |
|---|---|
| Voltage | 2x female connector, Push-IN, 4-pin<br>- Stripping length: 9mm<br>- Clamping range: 0.14mm2 - 1.5mm2 |
| Ethernet | 2x RJ45 socket |
| Antenna | 2x RP-SMA socket |
| USB | 1x USB socket type A |

#### Ambient conditions

| | |
|---|---|
| Operation temperature | -10°C … +60°C |
| Storage temperature | -10°C … +60°C |
| Protection class | IP00 |

### Mechanical Data

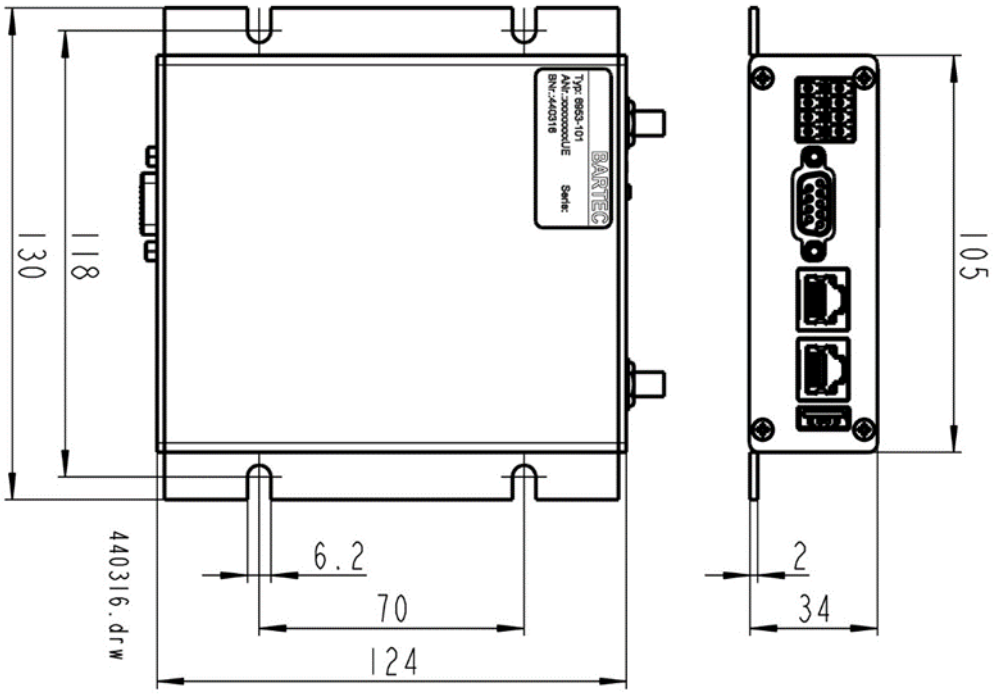
| | |
|---|---|
| Dimensions | See drawing |
| Mounting | Mounting brackets |
| Weight | Approx. 400g |
| Material | Aluminium (anodised) |

### Order details

| Designation | Order number |
|---|---|
| WLAN adapter, type 6953-101 | 440316 |
| WLAN front antenna set, type 6982-100, including 5m antenna connection cable | 400522 |

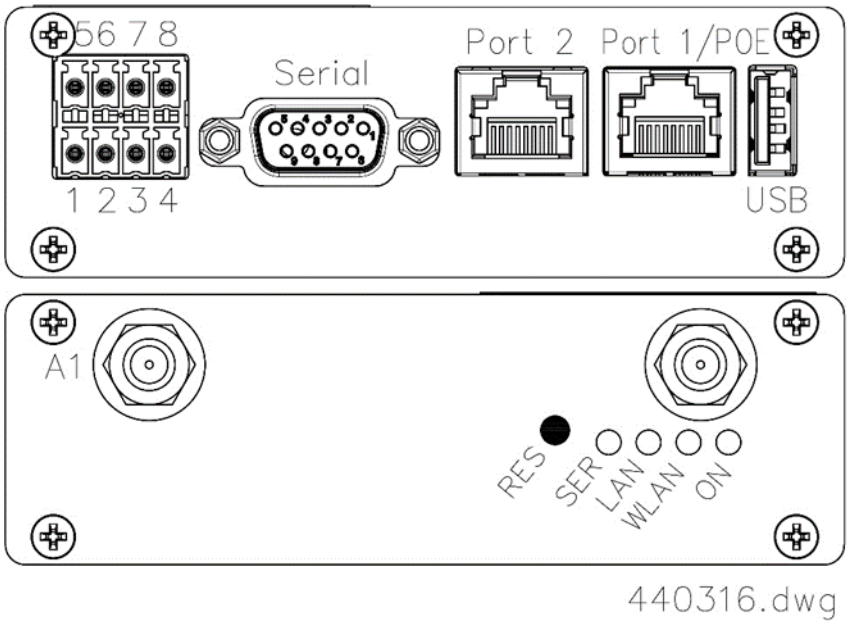
## 7.24.2 Dimensions and mounting

- The WLAN adapter is mounted using the mounting brackets. A free area for the connectors should be planned in front of the WLAN adapter connections.
- The WLAN adapter 6953-101 may not be installed and operated in potentially explosive atmospheres.




The WLAN-adapter 6953-101 may not be installed and operated in explosive areas.

## 7.24.3 Connections



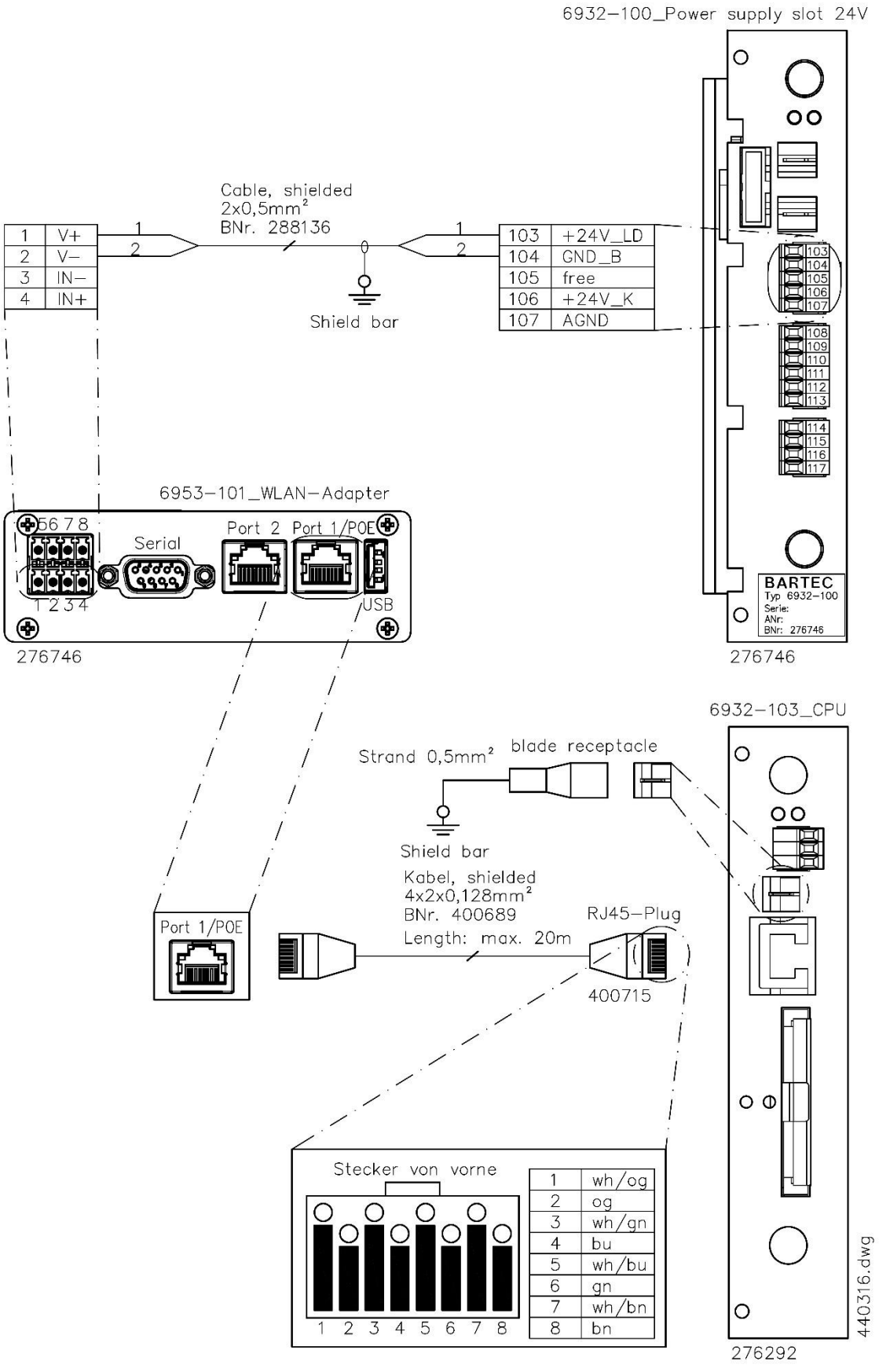

| | |
|---|---|
| 1 | V+ |
| 2 | V– |
| 3 | IN– |
| 4 | IN+ |
| 5 | frei |
| 6 | NC |
| 7 | C |
| 8 | NO |

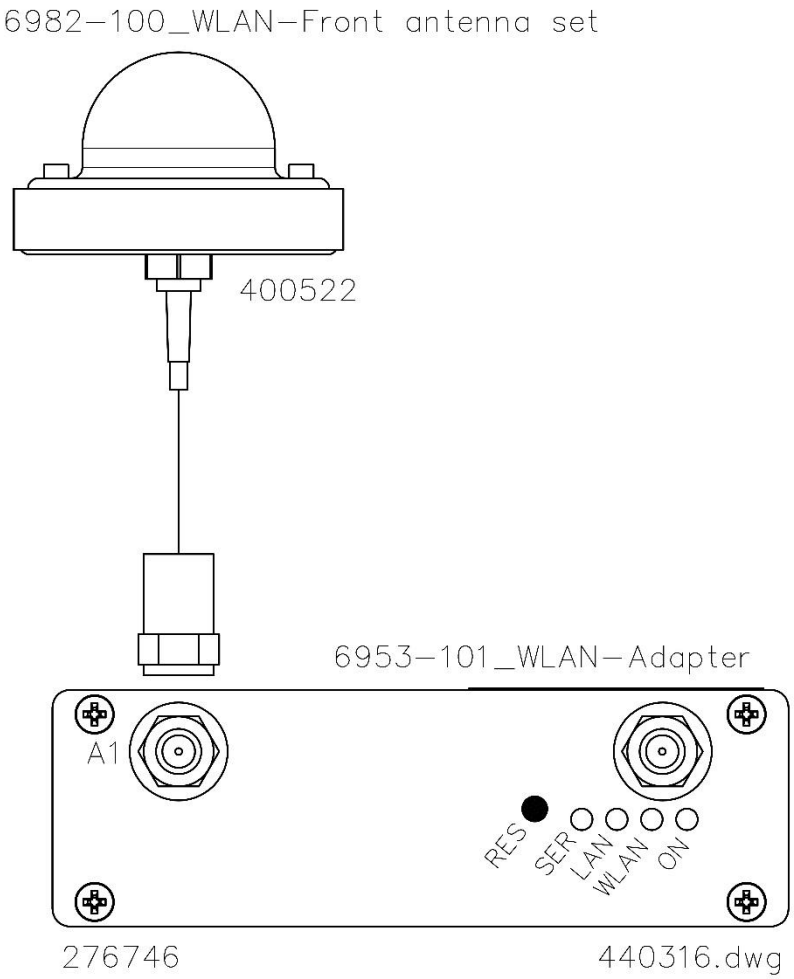
## 7.24.4 LED-display

The 4 LEDs, WLAN, LAN, SER and ON on the front panel indicate the operating status of the WLAN adapter. All 4 LEDs light up briefly in white after switching on or after a reset. During a firmware update or reconfiguration, the WLAN + LAN + SER LEDs flash blue.

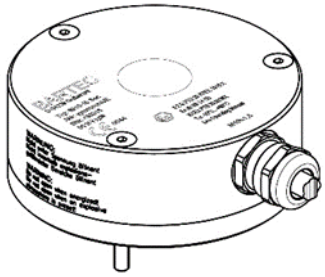
| LED | Status | Function |
|---|---|---|
| ON | Off | No or insufficient supply voltage |
| | Green | Supply voltage connected |
| | Green/yellow blinking | Normal mode |
| WLAN | OFF | WLAN option switched off |
| | Red blinking | WLAN-Adapter search for a matching access points or will be authenticated |
| | Green | WLAN-Connection OK<br>Short red light indicates activity (send or receive) on the interface |
| LAN | OFF | Control computer not connected |
| | Green | Control computer is available and switched on<br>Short red light indicates activity on the interface |

## 7.24.5 Wiring


6932–100_Power supply slot 24V
Cable, shielded
2x0,5mm²
BNr. 288136
1 V+
2 V–
3 IN–
4 IN+
103 +24V_LD
104 GND_B
105 free
106 +24V_K
107 AGND
Shield bar
6953–101_WLAN–Adapter
5 6 7 8
1 2 3 4
Serial
Port 2
Port 1/POE
USB
276746
BARTEC
Typ 6932–100
Serie:
ANr:
BNr: 276746
276746
6932–103_CPU
Strand 0,5mm²
blade receptacle
Shield bar
Kabel, shielded
4x2x0,128mm²
BNr. 400689
Length: max. 20m
RJ45–Plug
400715
Port 1/POE
Stecker von vorne
1 wh/og
2 og
3 wh/gn
4 bu
5 wh/bu
6 gn
7 wh/bn
8 bn
1 2 3 4 5 6 7 8
276292
440316.dwg


6982–100_WLAN–Front antenna set
400522
6953–101_WLAN–Adapter
A1
RES
SER
LAN
WLAN
ON
276746
440316.dwg

# 7.25 TAG-Reader Ex, Type 6910-16



- The TAG-Reader Ex, type 6910-16 is used in combination with the RFID-TAG Mobile Ex, type 6952-52, for a quick and fast driver identification.

## 7.25.1 Technical data

### Device-specific data

| | |
|---|---|
| Protocol | ISO 15693 |
| Frequency | 13.56MHz |
| Read-/write-distance | Direct coupling |

### Electrical data

| | | |
|---|---|---|
| Operating voltage | DC 24V +- 5% | |
| Current consumption | 21mA … 25mA | |
| Power consumption | 0.5W … 0.6W | |
| Interface | RS485 (9600bit/s) | |
| Connection type | Open cable / 3x2x0,56mm2 / length 5m / cladding diameter 7,9mm +-3% | |
| Assignment | Color | Signal |
| | rd | +24V |
| | bu | GND |
| | gn | A |
| | ye | B |

### Ambient conditions

| | |
|---|---|
| Operating temperature | -10°C … +50°C |
| Storage temperature | -20°C … +70°C |
| Equipment group / category / type of protection | II 2 G Ex db IIB T4 Gb |
| Certificates | PTB 20 ATEX 1015 X<br>IECEx PTB 20.0036X |
| Protection class | IP66 |

### Mechanical Data

| | |
|---|---|
| Dimensions | See drawings |
| Mounting | 3x screws M5 |
| Material | POM |
| Weight | ca. 0,5kg (without cable 5m) |

### Order details

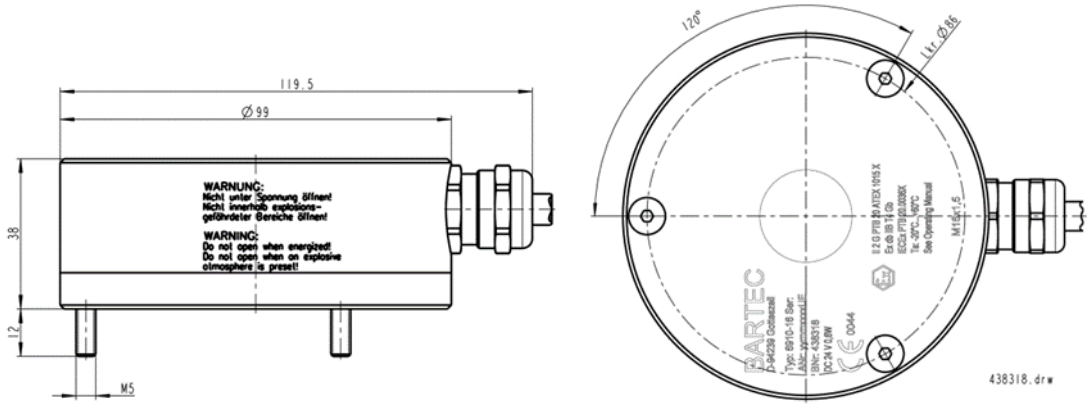
| Designation | Order number |
|---|---|
| TAG-Reader Ex, type 6910-16 | 438318 |
| RFID-TAG Mobile Ex, type 6952-52 | 447506 |

## 7.25.2 Safety instructions

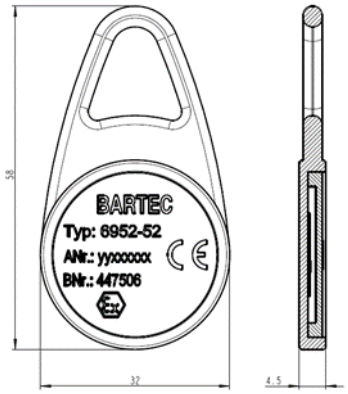
- The device must be mounted on an earthed metal mounting plate using three M5 countersunk metal screws.
- The connection cable must be laid securely and in such a way that it is adequately protected against damage.
- The connection cable must be connected in an enclosure that meets the requirements of a recognised type of protection in accordance with EN 60079-0, section 1, if the connection is made in a potentially explosive atmosphere.
- The cable glands of the HSK-M-Ex-d, HSK-INOX-Ex-d, HSK-M-PVDF-Ex-d and HSK-INOX-PVDF-Ex-d series have been tested with a reduced tensile force (25 %) in accordance with section A.3.1 of EN 60079-0 and may only be used for fixed installation of Group II equipment. The operator must ensure that the cable is appropriately clamped.
- The TAG-Reader Ex may only be used in conjunction with the RFID-TAG Mobile Ex, type 6952-52 when used in potentially explosive atmospheres.
- The device must not be opened.

## 7.25.3 Dimensions and mounting

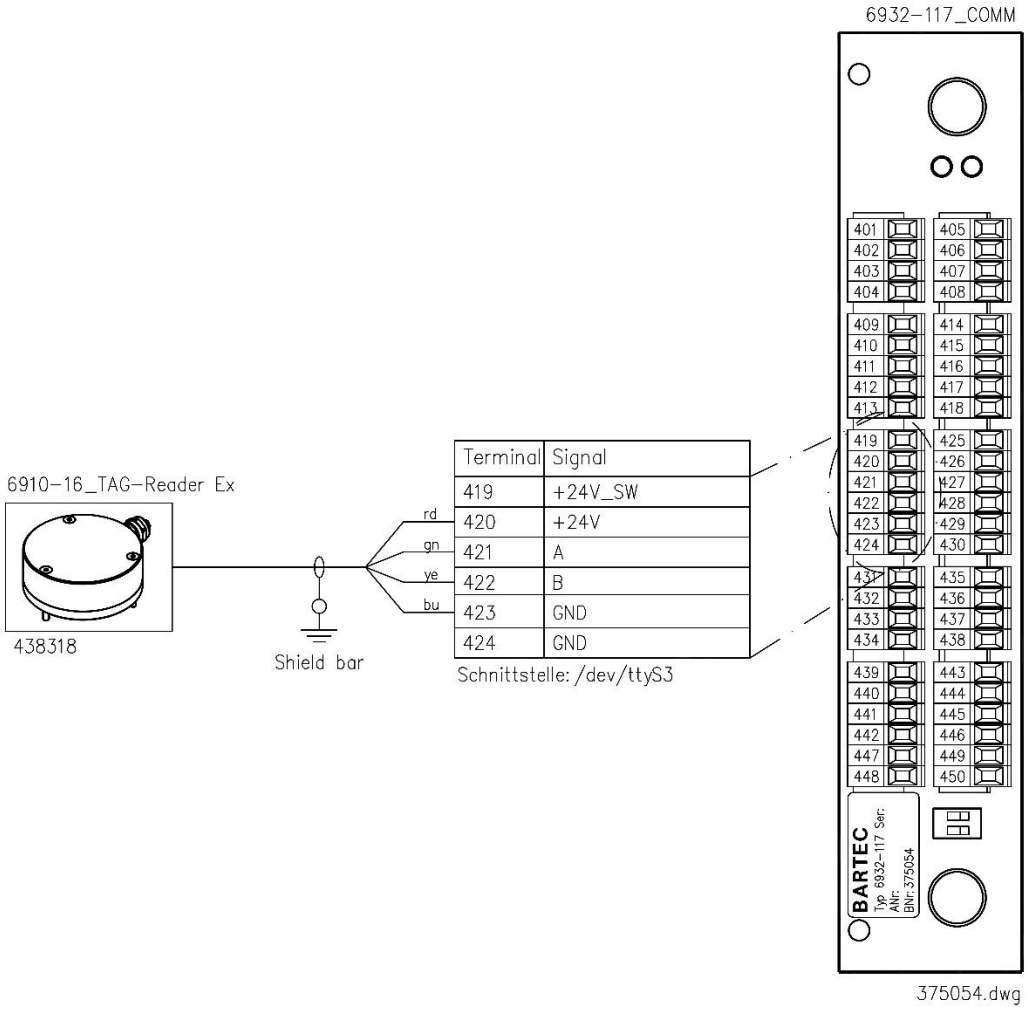
- The TAG-Reader Ex must be mounted on an earthed metal mounting plate using three M5 countersunk metal screws.
- The TAG-Reader Ex can be installed next to the display and control unit, for example.




- Dimensions RFID-TAG Monbile EX, type 6952-52:



## 7.25.4 Wiring




| Colour | Signal | 6932-117 COMM |
|---|---|---|
| rd | +24V | 420 |
| gn | A | 421 |
| ye | B | 422 |
| bl | GND | 423 |

## 7.25.5 Functional description

With the TAG-Reader Ex and the RFID-TAG Mobile Ex, it is possible to realise fast and secure driver registration on the System 3003. The driver is verified via an installed driver database. If the registration is successful, a refuelling order can be accepted and executed. Each refuelling order must be preceded by a registration.

A successful driver registration also corresponds to a tour start. The driver name is transferred to the tour journal. The tour is ended when you switch to the window start screen/basic menu. If a driver change is detected during a tour, the current tour is ended and a new one is started. The system can also be switched off via the Special functions window without leaving the tour, e.g. for breaks.

A text file is required to create a driver database. The file name must begin with RC and the extension is SDC, e.g. RC_Driverdata.SDC. A line entry consists of a primary key, the RFID TAG number, the driver name and the language. The SDC file can be transferred to the system via the FTL-FTP office interface or packed in a b3i file via the service tool.

| Example: | |
|---|---|
| | 1,E00402D00045EB0C,Pattern,de |
| Field 1: | Driver number (numeric, 6 digits, primary key) |
| Field 2: | Tag-ID (alphanumeric, 16 characters) |
| Field 3: | Driver name (alphanumeric, 30 characters) |
| Field 4: | Language (alphanumeric, 5 characters) |

# 7.26 GPS receiver, type 6722-18

## 7.26.1 Technical data

### Electrical data

| | |
|---|---|
| Auxiliary energy | DC 6 ... 40 V |
| Power consumption, typical | 50 mA at DC 24 V |
| Receiver antenna | installed |
| Interfaces | RS 232 |
| Electrical connection | 5 m cable length, open lead ends |

### Ambient conditions

| | |
|---|---|
| Operating temperature | -30 ... +80 °C |
| Protection type | IP 67 (1 meter immersion depth for 30 minutes) |

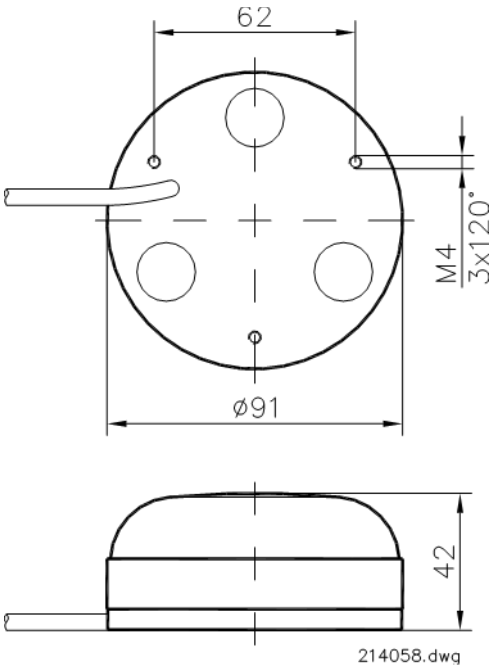
### Mechanical Data

| | |
|---|---|
| Dimensions | See drawing |
| Mounting screws | 3 x M4, do not excess the maximum depth of thread of about 8,0 mm (risk of breakage) |
| Weight | 330 g including 5 m cable |

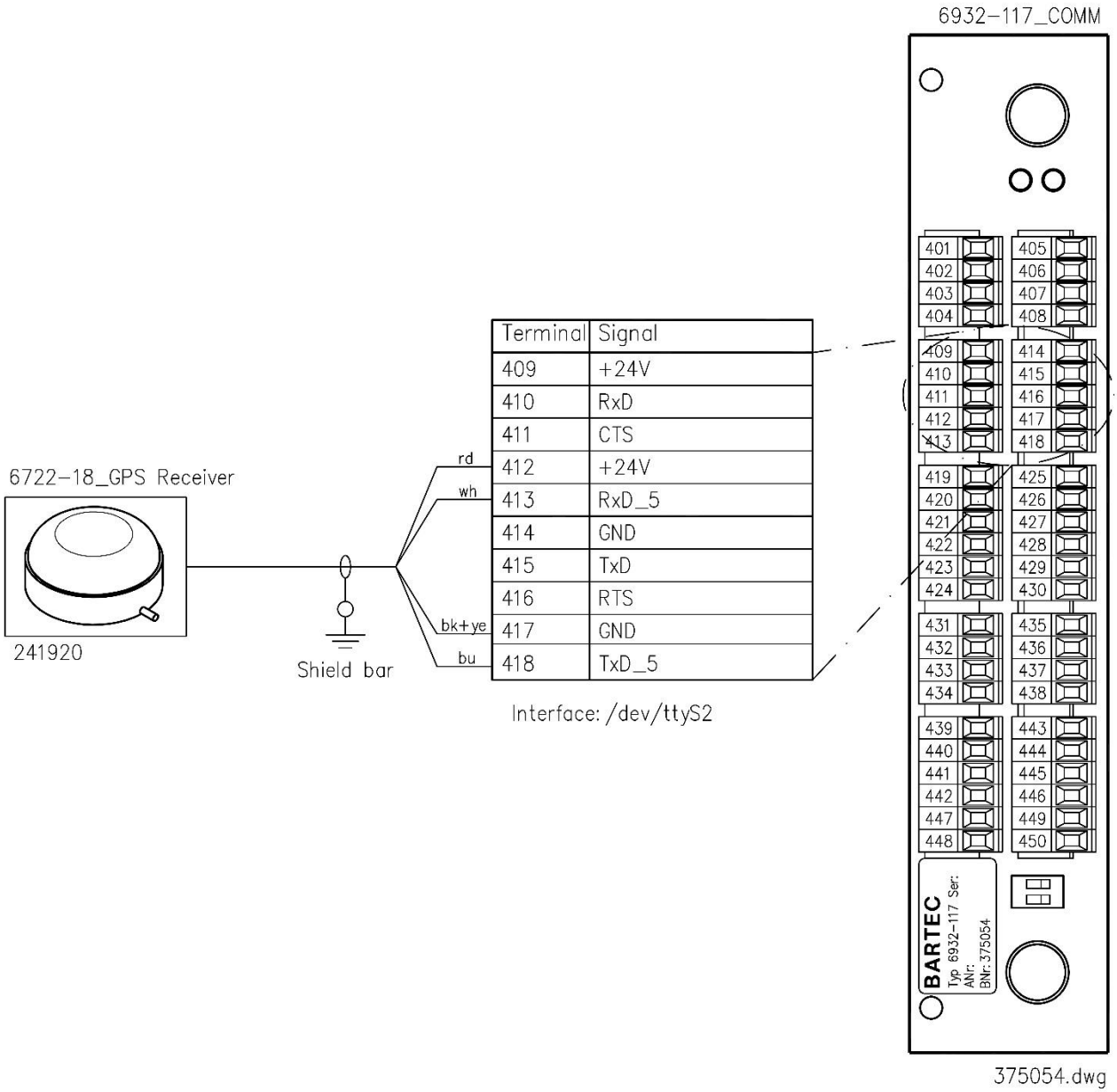
### Order details

| Designation | Order number |
|---|---|
| GPS receiver, type 6722-18 | 241920 |

## 7.26.2 Dimensions and mounting

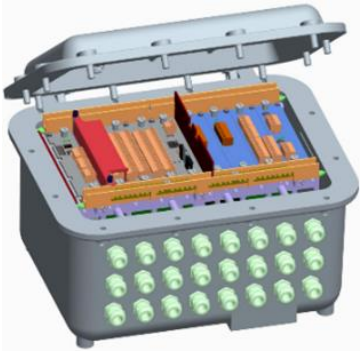


## 7.26.3 Wiring




The interface can be used either for the large display or for the GPS receiver.

# 7.27 Basic module (slave)

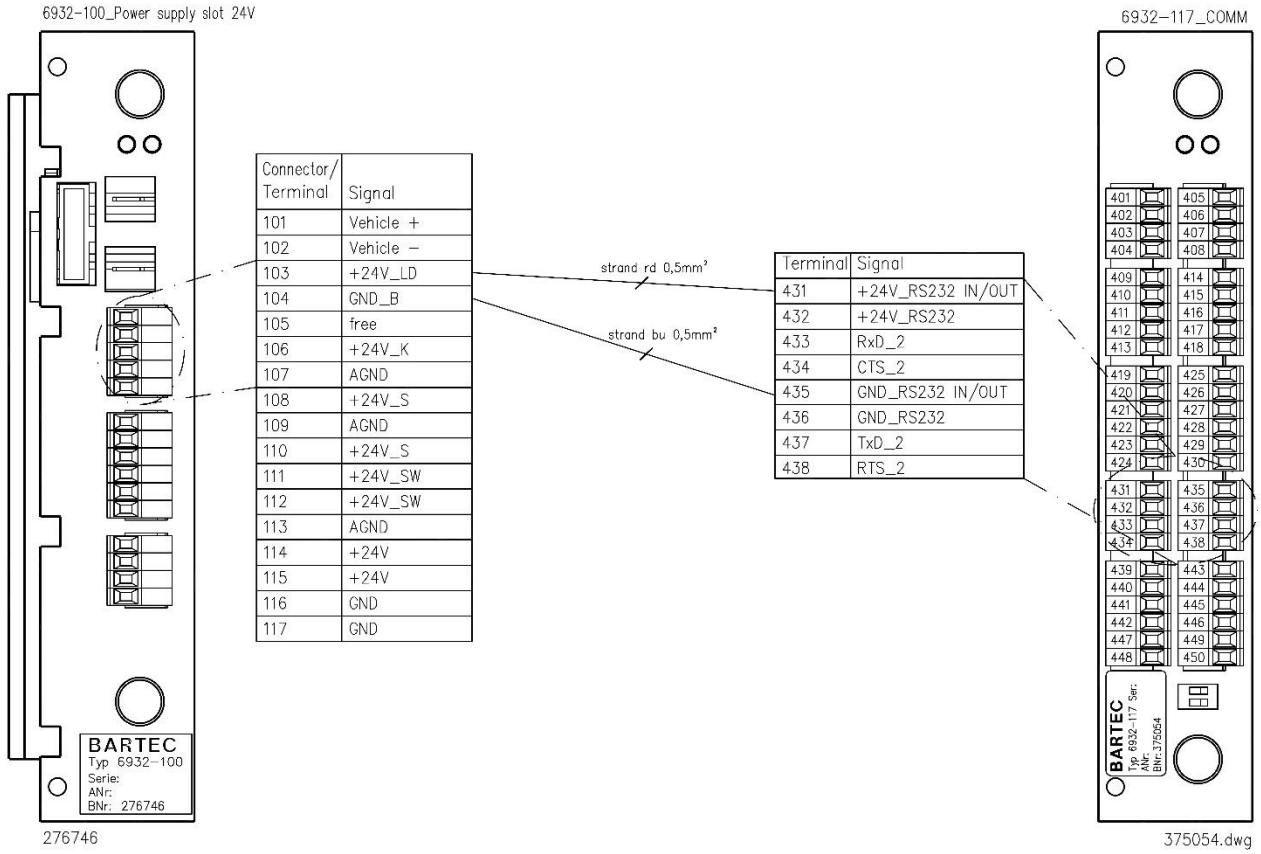


► A second base module (slave) can be used to implement parallel refuelling.

This chapter only contains information on using a second base module as a slave for parallel refuelling. A detailed description of the base module and its components can be found in the previous chapters.

## 7.27.1 Wiring

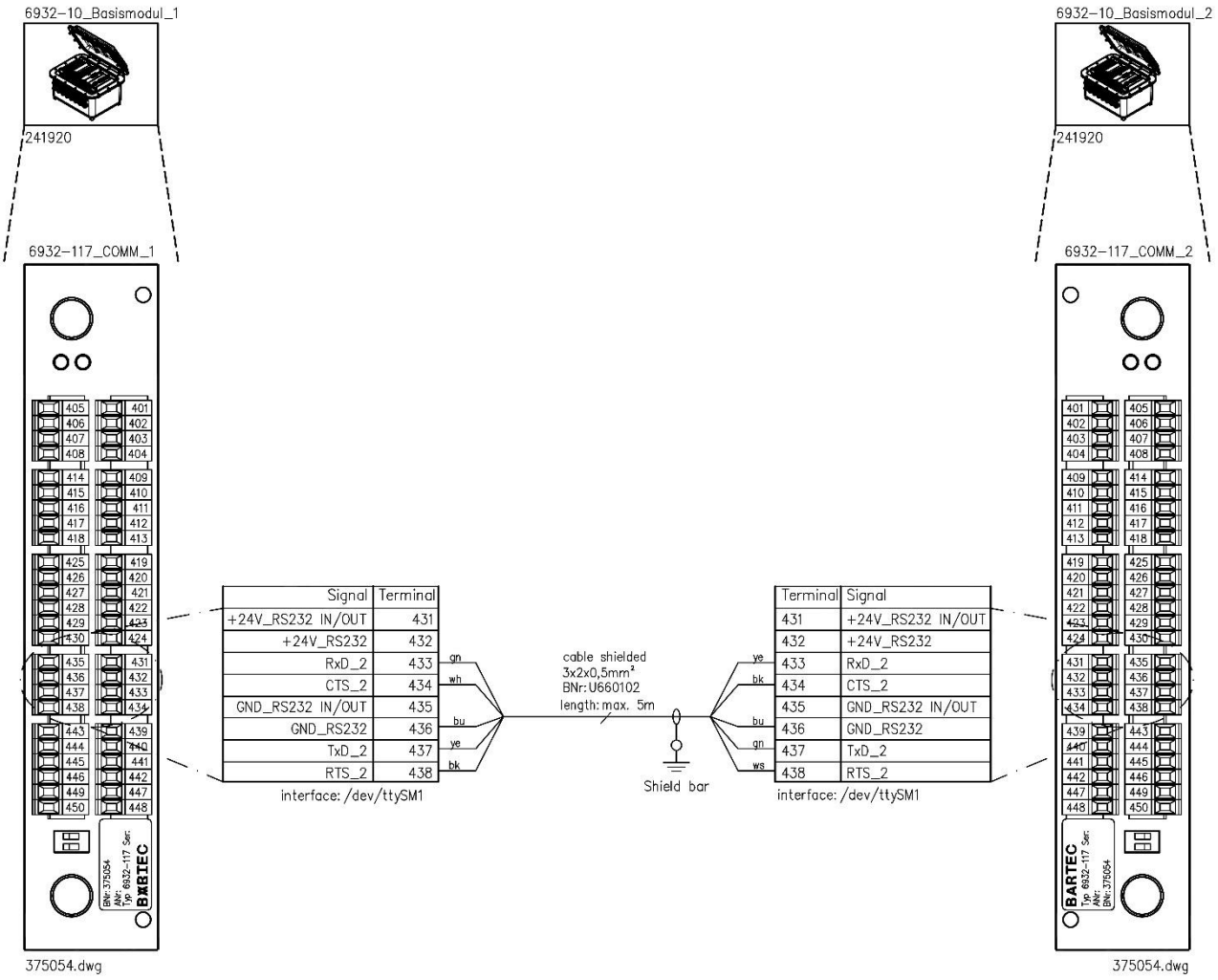
Power supply for the RS232 interface.




| Connector/ Terminal | Signal |
|---|---|
| 101 | Vehicle + |
| 102 | Vehicle − |
| 103 | +24V_LD |
| 104 | GND_B |
| 105 | free |
| 106 | +24V_K |
| 107 | AGND |
| 108 | +24V_S |
| 109 | AGND |
| 110 | +24V_S |
| 111 | +24V_SW |
| 112 | +24V_SW |
| 113 | AGND |
| 114 | +24V |
| 115 | +24V |
| 116 | GND |
| 117 | GND |

| Terminal | Signal |
|---|---|
| 431 | +24V_RS232 IN/OUT |
| 432 | +24V_RS232 |
| 433 | RxD_2 |
| 434 | CTS_2 |
| 435 | GND_RS232 IN/OUT |
| 436 | GND_RS232 |
| 437 | TxD_2 |
| 438 | RTS_2 |

The RS-232 interface must be supplied with power at both base modules.

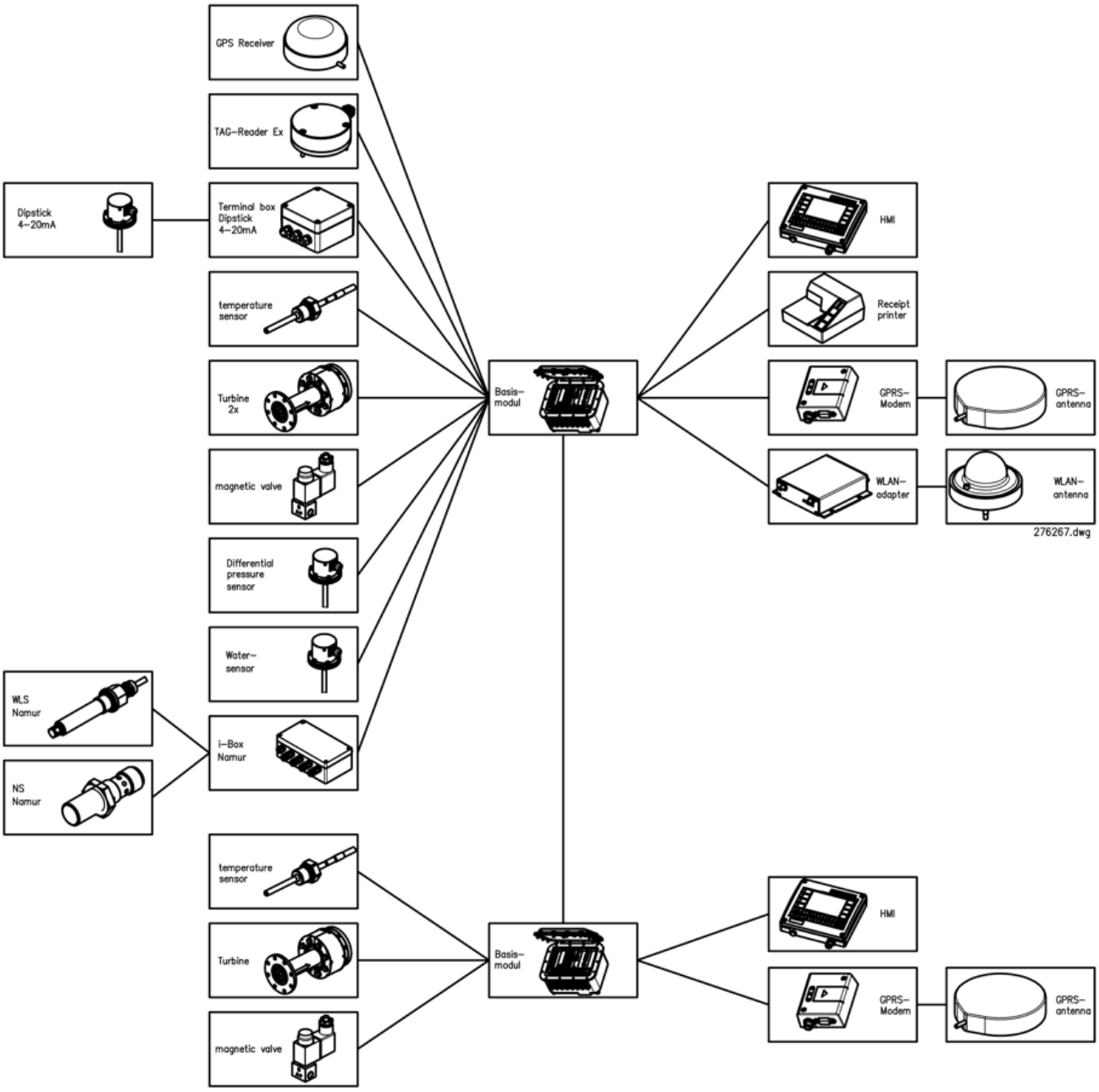



## 7.27.2 Functional description

The use of a second base module (slave) enables the realisation of parallel dispensing, i.e. two refuelling operations can be carried out simultaneously. For this purpose, the second base module is connected to the first base module (master) via an RS-232 interface. The master and slave base modules transmit all data relevant to the refuelling operations to each other, e.g. quantity, flow rate, differential pressure, water value, ....

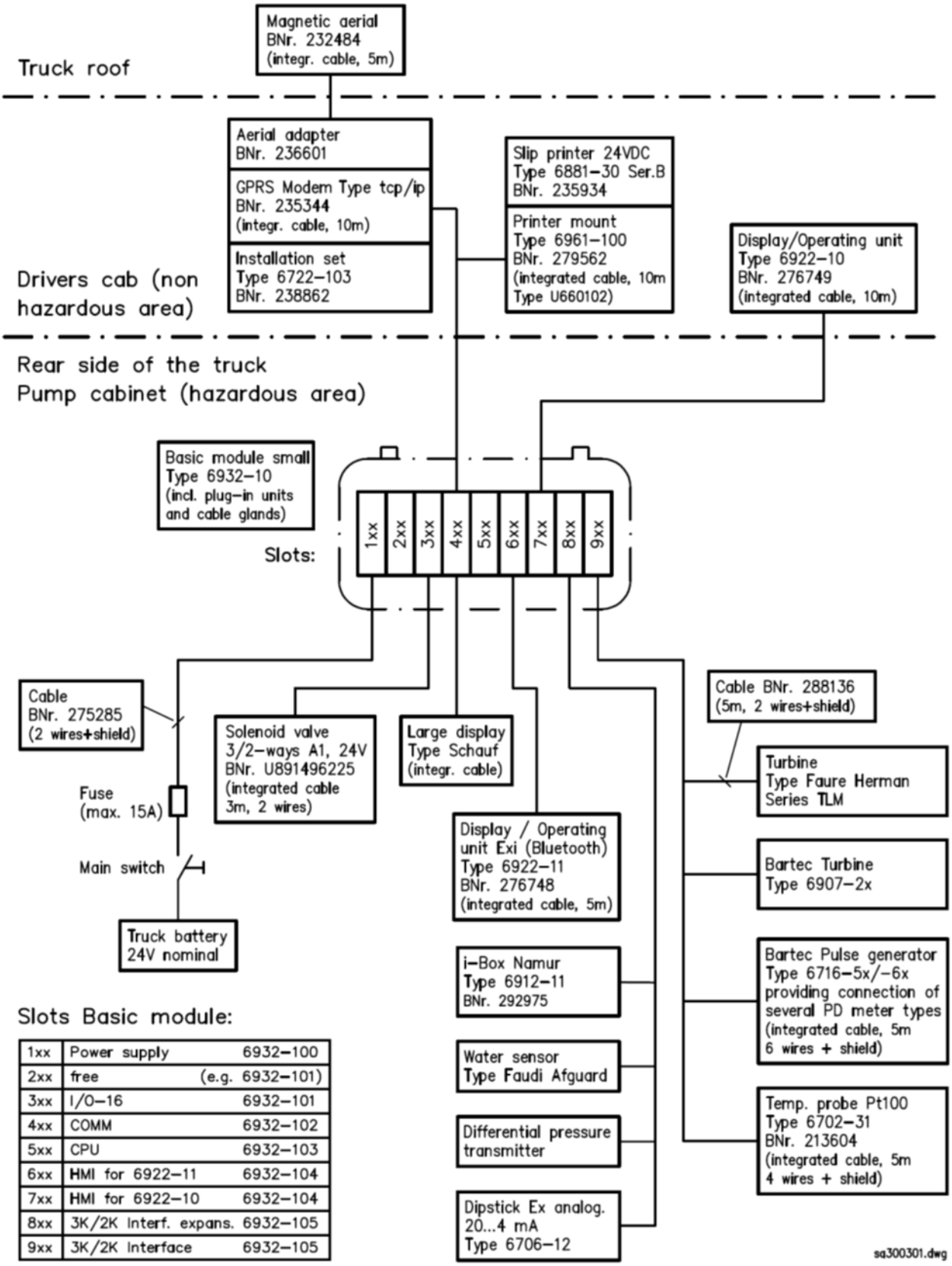
The master base module controls the outputs required for water and differential pressure evaluation. Refuelling can be started at each base module. If the slave base module detects a connection interruption during refuelling, it cancels the refuelling release. It is no longer possible to continue refuelling on the slave base module. Refuelling on the master base module is not affected by an interruption in the connection to the slave base module.

## 7.27.3 Block diagram



# 8 Attachement

## 8.1 Block diagram




Slots Basic module:

| | | |
|---|---|---|
| 1xx | Power supply | 6932-100 |
| 2xx | free (e.g. | 6932-101) |
| 3xx | I/O-16 | 6932-101 |
| 4xx | COMM | 6932-102 |
| 5xx | CPU | 6932-103 |
| 6xx | HMI for 6922-11 | 6932-104 |
| 7xx | HMI for 6922-10 | 6932-104 |
| 8xx | 3K/2K Interf. expans. | 6932-105 |
| 9xx | 3K/2K Interface | 6932-105 |

# 9 Servicing and care

Before starting work, familiarise yourself with the general safety instructions (see ‘Safety’ chapter).

Servicing and care should be carried out only by trained and qualified personnel.

## 9.1 Maintenance work

### 9.1.1 Servicing

Regular servicing is recommended if the unit is operated properly and in accordance with the instructions and ambient conditions.

Servicing and care

- ► For maintenance, servicing and testing of the equipment, the currently valid regulations and the national regulations must be complied with.
- ► Operating and maintenance work may be carried out only by trained and qualified personnel. Statutory regulations and other binding guidelines on occupational safety, accident prevention, and environmental protection must be observed.

### 9.1.2 Visual inspection

Carry out a visual inspection every month:

- ► Check the product, cable entries and cables for damage.
- ► Check screw connections for tightness.
- ► Check the fault recorder for contents.

### 9.1.3 Cleaning

Do not use solvents to clean the product as they can damage seals.

### 9.1.4 Repairs

Repairs to the product and accessories may be carried out only by trained and qualified specialist or service companies.

### 9.1.5 Faults and error messages

**A change in operating behaviour may be an indication of existing damage.**

- ► Do not put the product back into operation until the cause of the fault has been eliminated.

# 10 Notes

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