

EN CE IP66

**Operating Manual**  
**Junction Box**

Junction box AAB-X22/X2  
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– Translation –

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## Abstract

The Advanced Discovery System (ADICOS®) is used for early detection of fires in industrial environments. It is comprised of various, separate detector units. By parameterizing and arranging the detectors appropriately, the system fulfills a predefined detection goal. The ADICOS system ensures reliable early detection of embers and smoldering fires even in adverse environments.

AAB-X22/X2 are Junction boxes and serve as wiring aids for ADICOS detectors within potentially explosive areas of ATEX zone 22 and 2. They are surface-mounted connection boxes with an internally connected printed circuit board and enable the electrical connection of ADICOS detectors of all models to the special fire alarm system in a very simple way. Thanks to their robust mechanical design, they are protected against the ingress of dust and moisture and can be installed and used in harsh industrial environments in the vicinity of the ADICOS detectors.

- Compact design
- Robust polyester enclosure
- Easy mounting
- High resistance to moisture and dust
- Suitable up to ATEX zone 22 and 2
- Low wiring effort due to push-in spring terminals
- Connection of supply voltage, M-Bus, external fire alarm LOOP as well as alarm and fault contact
- Up to five cable glands

# Contents

1	About this Manual .....	5
1.1	Objective .....	5
1.2	Explanation of Symbols .....	5
1.3	Abbreviations .....	6
1.4	Storing the Manual .....	6
2	Safety Instructions .....	6
2.1	Intended Use .....	7
2.2	Standards and Regulations .....	7
2.3	Personnel Qualification .....	8
2.4	Handling Electrical Voltage .....	8
2.5	Modifications .....	8
2.6	Accessories and Spare Parts .....	8
3	Scope of Delivery .....	9
4	Product Description .....	9
4.1	Overview .....	10
4.2	Connections .....	11
4.3	Cable Glands .....	13
5	Installation .....	14
5.1	Selecting the Mounting Location .....	14
5.2	Opening and Closing the Enclosure Cover .....	14
5.3	Mounting .....	15
5.4	Wiring .....	17
6	Commissioning .....	23
7	Operation .....	24
8	Failure .....	24
9	Maintenance .....	24
9.1	Replacement and Repair .....	25
10	Disposal .....	25
11	Technical Data .....	26
11.1	ID Plate .....	27

## 1 About this Manual

### 1.1 Objective

This manual describes the proper assembly, wiring, commissioning, and operation of ADICOS junction boxes AAB-X22/X2. Once the device has been successfully started up, this document serves as a reference in the event of malfunctions.

It is intended to be used only by properly qualified personnel (see Chap. 2 Safety Instructions)

#### Operational objectives

Operational objectives specify the result to be achieved by following the subsequent instructions. Operational objectives are shown in **bold print**.

#### Instructions

Instructions are the steps to be taken in order to achieve the previously stated operational objective.

Instructions appear like this

▶ Indicates a single instruction

- 1 First of a series of instructions
- 2 Second of a series of instructions
- 3 etc.

#### Intermediate states

When it is possible to describe intermediate states or events resulting from the instruction steps (e.g. screens, internal function steps, etc.), they are shown like this:

▷ Intermediate state

### 1.2 Explanation of Symbols

This manual follows a certain structure to make it easy to work with and understand. The following designations are used throughout.

#### Warnings

The following types of notes are used through this manual:

**DANGER!**

This combination of symbol and signal word indicates an immediately dangerous situation which could lead to death or severe injuries if it is not avoided.

**WARNING!**

This combination of symbol and signal word indicates a possibly dangerous situation which could lead to death or severe injuries if it is not avoided.

**Explosion protection**

This information type signals measures that must be implemented for maintaining the Explosion protection.

**Tips and recommendations**

This type of note provides information that is directly relevant for the further operation of the device.

### 1.3 Abbreviations

This manual uses the following abbreviations:

Abbreviation	Meaning
ADICOS	Advanced Discovery System
AAB	ADICOS Junction box
M-BM	ADICOS M-BUSMASTER
NT	ADICOS Power Supply NT V40-A3
FDnet	Field Device Network (fire alarm bus of SIEMENS fire alarm systems)
LSNi	Local Security Network (fire alarm bus of BOSCH fire alarm systems)
BMA	Fire Alarm Panel (Brandmeldeanlage)

### 1.4 Storing the Manual

Store this manual easily reachable and in direct vicinity of the system to enable use as needed.

## 2 Safety Instructions

When properly installed, started up, operated and serviced, ADICOS junction boxes AAB-X22/ X2 ensure operational safety at your facility. But it is imperative that the manual, including all safety notes, be read, understood and followed completely.

**WARNING!****Personal injury and property damage!**

Incorrect installation and operating errors can cause death, serious injury and damage to industrial equipment.

- **Read the entire manual and follow the instructions!**



### Explosion protection

When using ADICOS detectors in potentially explosive atmospheres, follow the specifications of the ATEX operating directive.

## 2.1 Intended Use

ADICOS AAB-X22/-X2 are junction boxes for the electrical connection of ADICOS detectors with the fire alarm cable of ADICOS systems in potentially explosive areas of ATEX zone 22 and 2.

They additionally enable feeding-in an external voltage supply using the ADICOS power supply NT V40-A3. In this context, the operating parameters described in Chap. 11, »Technical data« must be met. Any use deviating from this in potentially explosive atmospheres is not permitted. Compliance with this manual as well as all applicable country-specific provisions is also part of the intended use.

## 2.2 Standards and Regulations

The current safety and accident prevention regulations relevant to the specific application must be complied with when installing, starting up, servicing and inspecting the detector.

The following standards and directives are of particular importance when handling fire alarm systems in potentially explosive areas.

Standards and Regulations	Description
EN IEC 60079-0:2018/AC:2020-02	Explosive atmospheres - Part 0: Equipment - General requirements
EN 60079-7:2015	Explosive atmospheres - Part 7: Equipment protection by increased safety ,e'
EN 60079-15:2010	Explosive atmospheres - Part 15: Equipment protection by type of protection „n“
EN 60079-31:2014	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure „t“
2014/34/EU	Harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
2014/34/EU	ATEX product directive (about equipment and protective systems intended for use in potentially explosive atmospheres)
1999/92/EG	ATEX operating directive (on safety and health protection of workers potentially at risk from explosive atmospheres)
Directive 89/686/EWG	Personal protective equipment

### 2.3 Personnel Qualification

Any work on ADICOS AAB-X22/X2 may only be performed by qualified personnel. Persons, who can perform work on electrical systems and recognize possible dangers based on their professional education, knowledge, and experience as well as knowledge of the applicable provisions, are considered qualified personnel.



**WARNING!**

**Personal injury and property damage!**

Improperly performed work on and with the device can lead to malfunctions.

- **Installation, startup, parameterization and maintenance may be performed only by authorized and properly trained personnel.**

### 2.4 Handling Electrical Voltage



**DANGER!**

**Risk of explosion by electrical voltage in potentially explosive atmospheres!**

The electronics of ADICOS HOTSPOT-X22/X2 detectors requires an electrical voltage that can trigger an explosion in potentially explosive atmospheres.

- **Do not open enclosure!**
- **De-energize the entire detector system and secure against unintentionally reactivation for all wiring work!**

### 2.5 Modifications



**WARNING!**

**Property damage or detector failure by any form of unauthorized modification!**

Any form of unauthorized modification or extension can lead to a failure of the detector system. The warranty claim expires.

- **Never make unauthorized modifications on your own authority.**

### 2.6 Accessories and Spare Parts



**WARNING!**

**Property damage due to short circuit or failure of the detector system**

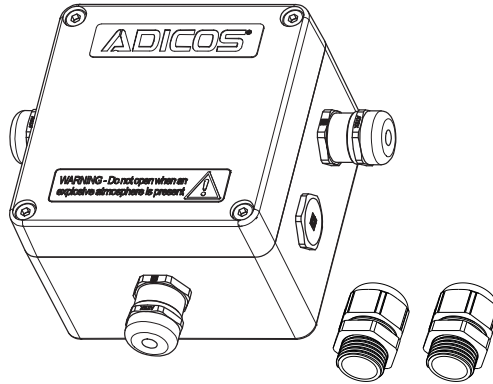
The use of parts other than the manufacturer's original spare parts and original accessories may result in property damage due to short circuits.

- **Only use original spare parts and original accessories!**
- **Original spare parts and accessories may only be installed by trained specialist personnel.**
- **Qualified personnel are persons as described in Chap. 2.3.**



### 3 Scope of Delivery

The following components are included in the scope of delivery of the AAB-X22/-X2:



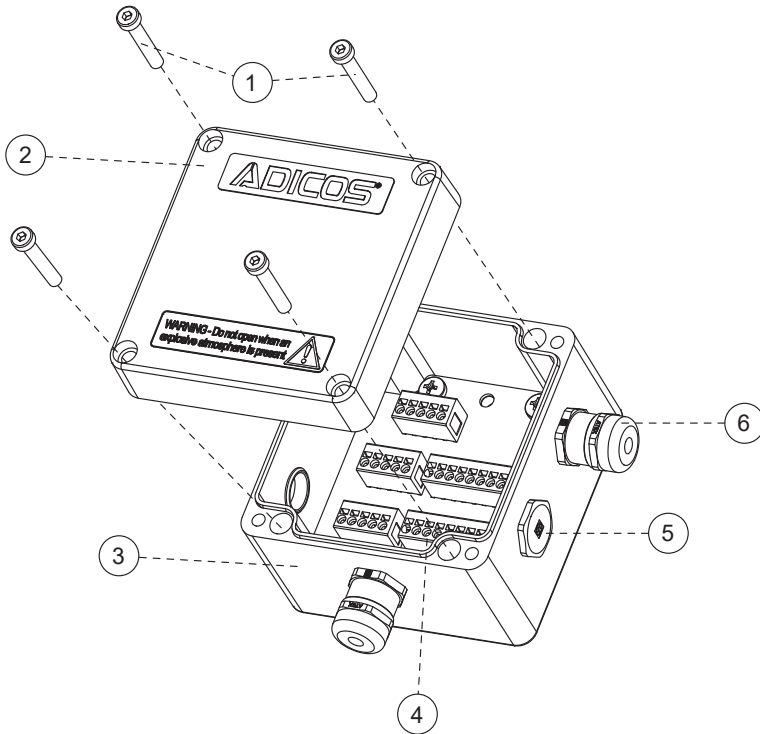
Quantity	Description
1	AAB-X22/X2 with 3 cable glands and 2 dummy cable glands
2	M20 cable glands*

\* Are located inside the enclosure at the time of delivery

### 4 Product Description

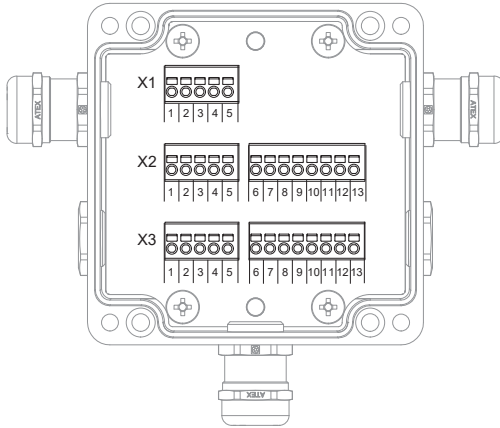
AAB-X22/X2 are connection and branch boxes and serve as wiring aids for ADICOS detectors within potentially explosive areas of ATEX zone 22 and 2. They are surface-mounted connection boxes with an internally connected printed circuit board and enable the electrical connection of ADICOS detectors of all models to the special fire alarm system in a very simple way. Thanks to their robust mechanical design, they are protected against the ingress of dust and moisture and can be installed and used in harsh industrial environments in the vicinity of the ADICOS detectors.

### 4.1 Overview



No.	Description
①	Enclosure screws (4x)
②	Enclosure cover
③	Enclosure base
④	AAB-X22/X2 circuit board with connection terminals
⑤	Blind cable glands (2x)
⑥	Cable glands (3x)

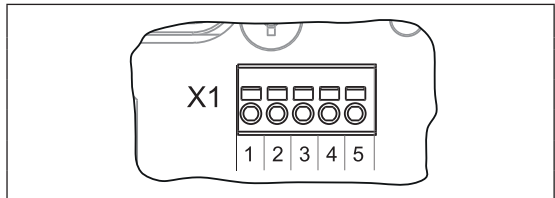
## 4.2 Connections



### 4.2.1 Connection Terminals

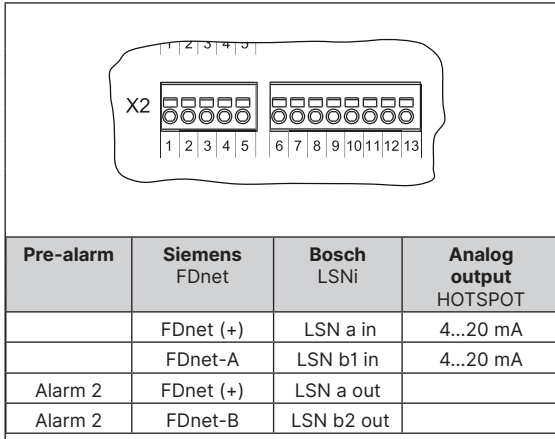
#### Connection terminal X1: Power supply/M-Bus input

X1	Signal
1	Shield
2	40 V (V+)
3	0 V (V-)
4	M-Bus A
5	M-Bus B



**Connection terminal X2: Output terminal/Fire alarm loop**

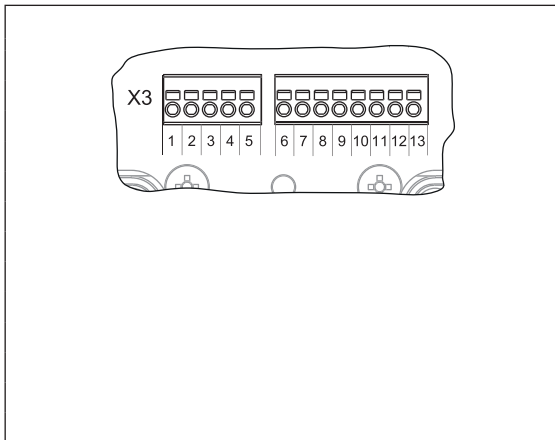
X2	Signal
1	Shield
2	40 V (V+)
3	0 V (V-)
4	Alarm
5	Alarm
6	Fault
7	Fault
8	M-Bus A
9	M-Bus B
10	Option
11	Option
12	Option
13	Option



The X2 terminal is used for wiring between the AAB-X22/X2 connection distributors. The assignment of the terminal option depends on the detector variant. For example, the Siemens or Bosch fire alarm loop can be wired via terminals 10 to 13. Alternatively, the 2nd alarm relay of the ADICOS detectors or the analog output signal of the ADICOS HOTSPOT detectors can be tapped at these terminals.

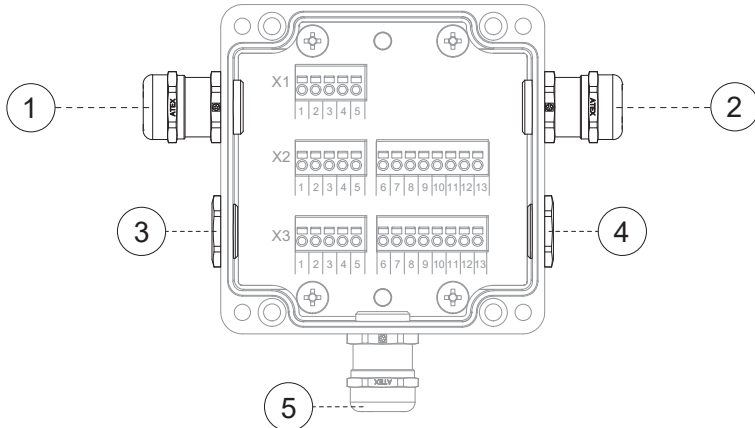
**Connection terminal X3: Detector connection**

X3	Signal
1	Shield
2	40 V (V+)
3	0 V (V-)
4	Alarm
5	Alarm
6	Fault
7	Fault
8	M-Bus A
9	M-Bus B
10	Option*
11	Option*
12	Option*
13	Option*



\* The assignment of the terminal option depends on the detector variant (see above).

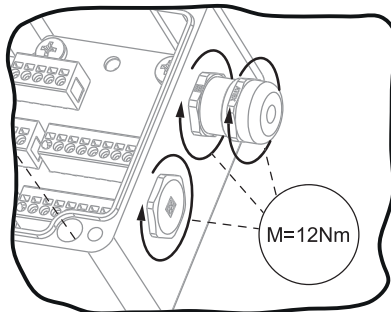
### 4.3 Cable Glands



The following assignment is exemplary and varies depending on the system configuration.

No.	Description
①	ADICOS primary line (ADICOS M-Bus / power supply / threshold value fire detector line)
②	ADICOS primary line (ADICOS M-Bus / power supply / threshold value fire detector line)
③	BMA-Loop (External fire alarm LOOP) (optional)
④	BMA-Loop (External fire alarm LOOP) (optional)
⑤	ADICOS connection cable for ADICOS detector

#### Torque cable glands and blind cable glands



## 5 Installation



### **DANGER!** **Explosion!**

Installation work may only be performed, if the potentially explosive area is released for work via a risk assessment.

- **De-energize the entire detector system and secure against unintentional reactivation!**
- **Installation work may only be performed by specialist personnel! (→ Chap. 2.3, Personnel qualification)**



### **Explosionsschutz**

When using ADICOS AAB-X22/X2 in potentially explosive atmospheres, follow the specifications of the ATEX Operational Directive.

### 5.1 Selecting the Mounting Location

The following aspects must be considered when selecting the installation location:

- the installation floor must be sufficiently firm and as vibration-free as possible.
- the installation environment must meet the climate conditions specified in the technical data.
- install the AAB-X22/X2 near to the connected detector and well accessibly.

### 5.2 Opening and Closing the Enclosure Cover

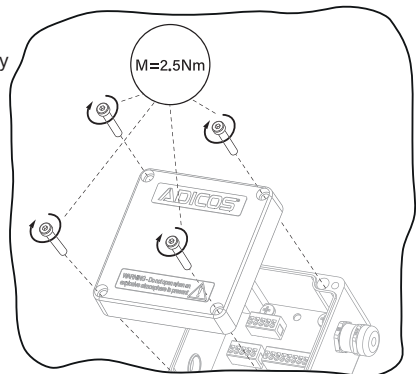


### **WARNING!** **Explosion!**

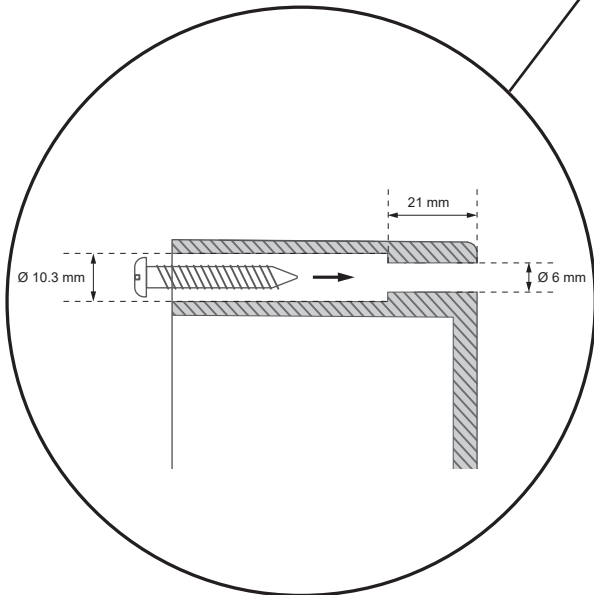
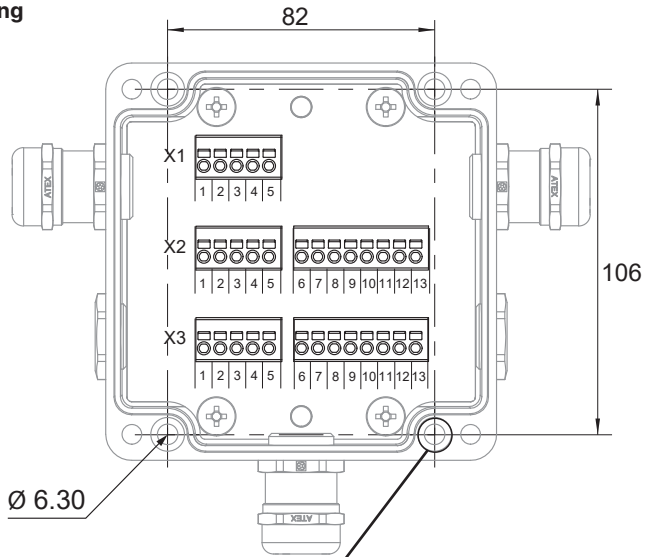
The degree of protection of ADICOS AAB-X22/X2 specified in the technical data is only granted if all cables are routed through the cable glands into the enclosure and if the glands then are securely tightened.

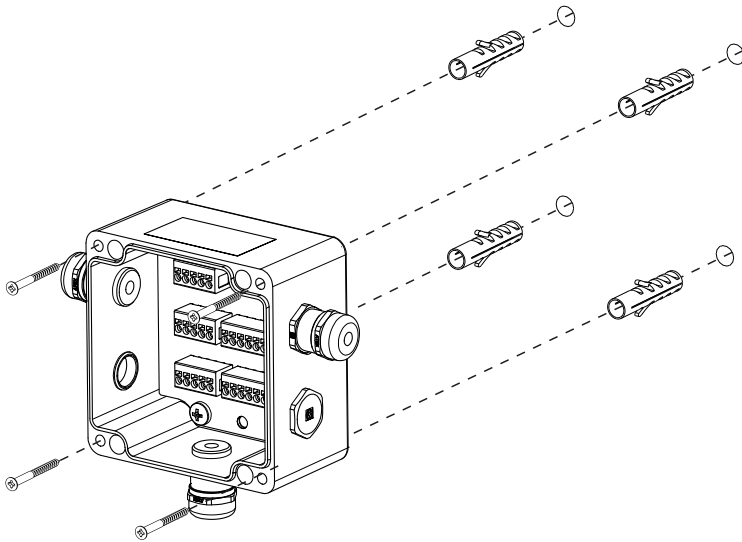
- **Close enclosure cover and cable glands prior to installation!**

- 1 Loosen the enclosure screws using a sufficiently large hexagon socket screwdriver (4x)
  - 2 Lift off the enclosure cover
- ▷ The enclosure is open, work can be performed
- 3 Put the cover on the housing
  - 4 Tighten the cover screws (4x), torque: 2.5 Nm.



**5.3 Mounting**





### Mounting the AAB-X22/X2

- 1 Depending on the underground, drill mounting holes for sufficiently dimensioned screws and/or wall plugs (4x) (see drilling plan)
- 2 Press in wall plugs
- 3 Open enclosure cover
- 4 Insert sufficiently dimensioned mounting screws through the tightening channels of the enclosure screws in the enclosure base so that the screws protrude from the rear side of the enclosure (4x)
- 5 Place the enclosure base with the screws onto the mounting holes with wall plugs
- 6 Tighten the screws (4x)
- 7 If wiring is not completed immediately, close the enclosure cover.

### Disassembly

- ▶ Carry out disassembly in reverse order



## 5.4 Wiring



### **DANGER!**

#### **Explosion!**

The electronics of ADICOS AAB-X22/X2 works with an electrical voltage that can trigger an explosion in potentially explosive atmospheres.

- **Route all cables through the cable glands into the enclosure and tighten the glands!**
- **When the wiring is done, tightly screw the enclosure cover!**
- **Do not bend the connection cables! Adhere to the minimum bending radius of the cables used!**

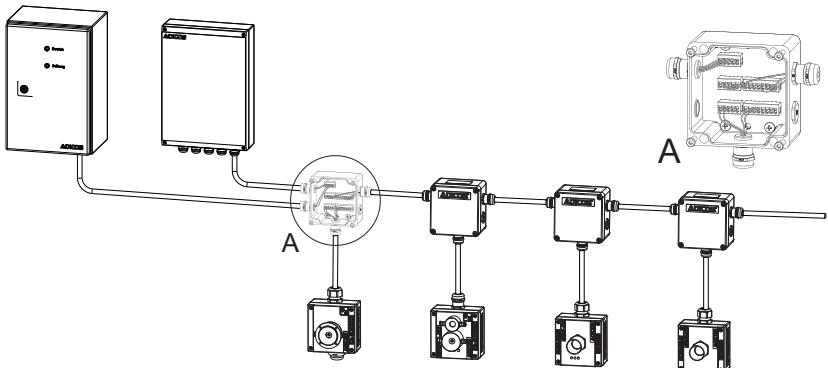


### **WARNING!**

#### **Explosion!**

The degree of protection of ADICOS AAB-X22/X2 specified in the technical data is only granted if all cables are routed through the cable glands into the enclosure and if the glands then are securely tightened.

- **Close enclosure cover and cable glands prior to installation!**



The wiring plan of the AAB-X22/X2 varies depending on system configuration and topology. The following procedure applies for all wiring variants.

### **Wiring ADICOS AAB-X22/X2**

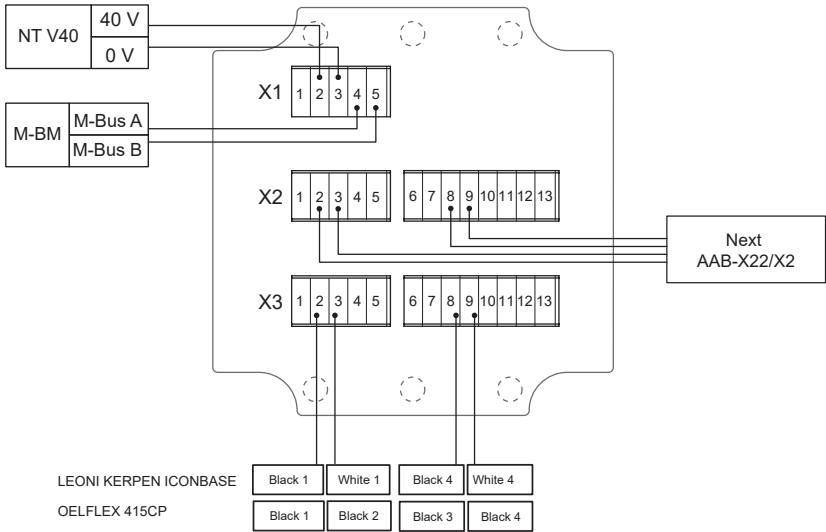
- 1 Open enclosure cover
- 2 Open cable glands
- 3 Route cables through the cable glands into the enclosure according to Chap. 4.4
- 4 Connect the wires to the connection terminals according to the wiring diagram
- 5 Close cable glands
- 6 Close enclosure cover

**In the case of wiring variants with more than three cables:**

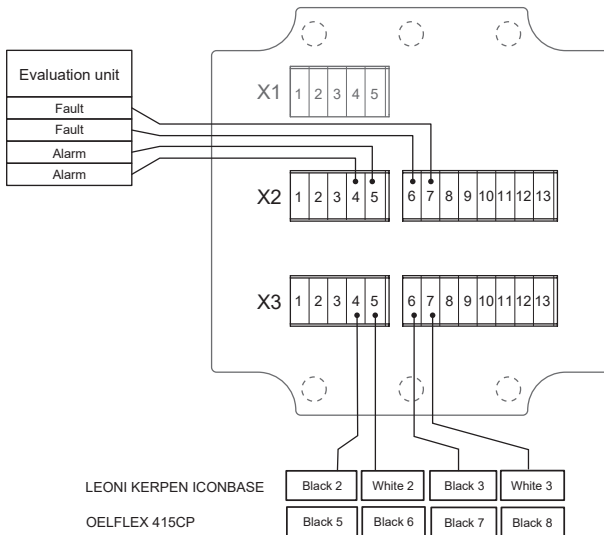
### **Installing additional cable glands**

- 1 Open enclosure cover
- 2 Take the loose additional cable glands from the enclosure
- 3 Unscrew the blind cable glands ③ and ④ (→ Chap. 4.3) using the 25 mm open-end wrench
- 4 Screw the additional glands into the M20 threads and tighten watertight with a 25 mm open-end wrench; torque:12 Nm (→ Chap. 4.3)

**M-Bus and power supply NT V40-A3**



**Fault and alarm „direct“**

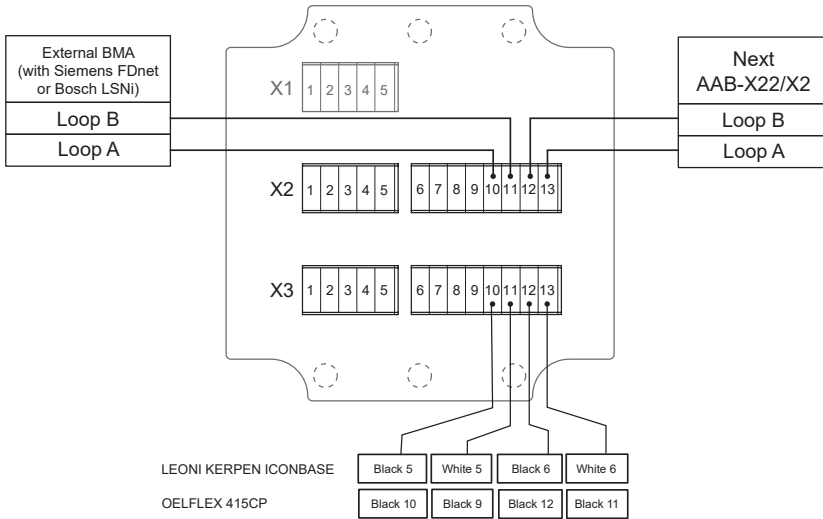


**Fire alarm LOOP with FDnet/LSNi (internal coupling module)**



**Tips and recommendations**

For integration in BOSCH or SIEMENS fire alarm systems, ADICOS detectors must be equipped with a coupling module by the manufacturer!

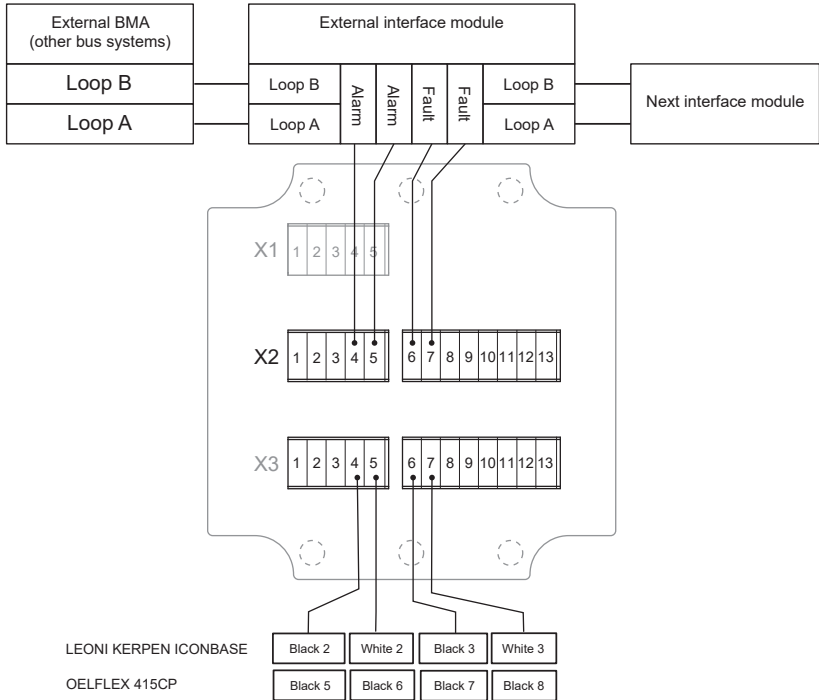


**Other fire detector bus systems (external interface module)**

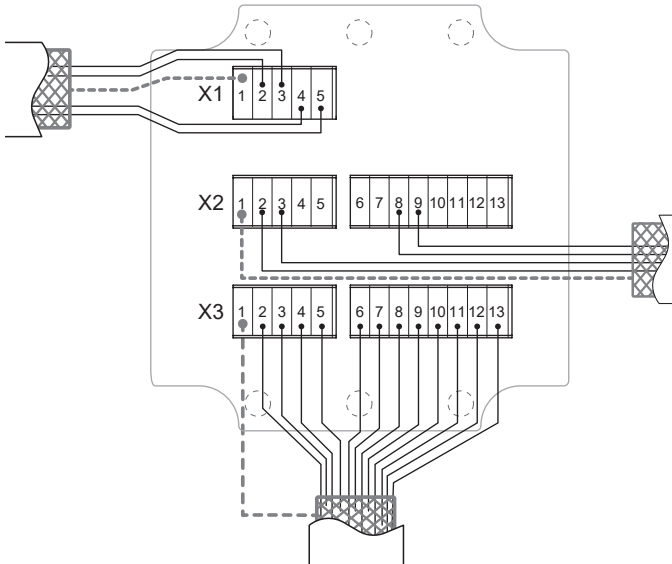


**Tips and recommendations**

For integration in other Non-ADICOS fire alarm systems suitable external interface modules are required.



**Primary cable shield**



## 6 Commissioning

- ▶ Before switching on the voltage, check that all cables are properly mounted and wired and that all bushings are closed.



### **DANGER!**

#### **Risk of explosion in hazardous areas due to electrical voltage.**

The electronics of the ADICOS AAB-X22/X2 requires an electrical voltage that can trigger an explosion in potentially explosive atmospheres.

- **De-energize the entire detector system and secure against unintentionally reactivation for all wiring work!**
- **In the case of wiring within potentially explosive atmospheres, only use explosion-proof junction boxes with respective approval!**
- **Do not bend connection cable! Observe minimum bending radius!**  
(→ Chap. 11, Technical Data)



### **WARNING!**

#### **Equipment damage!**

ADICOS systems work with electrical current, which can cause equipment damage if not installed properly.

- **Before switching on the system, verify that all components are properly mounted and wired.**
- **Commissioning may be performed only by properly trained personnel.**



### **Tips and recommendations**

The ADICOS AAB-X22/X2 is a passive component. Separate commissioning is not required.

- ▶ ADICOS system commissioning is to be performed according to the instructions of the M-Bus interface (M-Busmaster) used.

## 7 Operation

**DANGER!****Risk of explosion due to electrical voltage in hazardous areas.**

The electronics of ADICOS AAB-X22/X2 junction box works with an electrical voltage that can trigger an explosion in potentially explosive atmospheres.

- **Never open the enclosure or loosen the cable gland or blind gland during operation!**

**Tips and recommendations**

The ADICOS AAB-X22/X2 is a passive component. Its operating status depends on the higher-level M-Bus interface.

## 8 Failure

**DANGER!****Risk of explosion due to electrical voltage in hazardous areas.**

Troubleshooting measures may only be carried out if the potentially explosive atmosphere has been approved for work by a risk assessment.

- **For all troubleshooting measures, disconnect the entire detector system from the power supply and secure it against unintentionally reactivation!**

## 9 Maintenance

The AAB-X22/X2 normally does not require any special maintenance.

**DANGER!****Explosion!**

The plastic enclosure of the AAB-X22/X2 can statically charge in the case of friction and trigger an explosion.

- **Avoid friction on plastic surfaces!**
- **Use damp cloth for cleaning!**

**WARNING!****Explosion!**

Maintenance work may only be performed, if the explosive area is released-for work via a risk assessment.

- **De-energize the entire detector system and secure against**
- **unintentionally reactivation for all maintenance work!**



## 9.1 Replacement and Repair



- The AAB-X22/X2 may only be replaced as a whole.
- The AAB-X22/X2 must not be repaired.
- For any work on the AAB, it must be disconnected from the power supply and secured against accidental reconnection.

## 10 Disposal

Return the product to the manufacturer after the end of the useful life. The manufacturer ensures environmental-friendly disposal of all components.






## 11 Technical Data


<b>General</b>		
Model		AAB-X22/X2
Article No.		430-2002-101
Dimensions (W x H x D)	mm	177.5 x 151 x 91
Weight	kg	0.95
Degree of protection		IP66
Enclosure		Polyester
Mounting		Surface mounting
<b>Electrical properties</b>		
Rated voltage	V	DC max. 60
Max. current	A	4.9
Max. cable cross-section	mm <sup>2</sup>	4
<b>Environmental conditions</b>		
Permissible environment temperature	°C	-30 ... +65
Relative humidity	%	≤ 95 (non-condensing)
Installation environment		vibration-free
<b>Cable gland and dummy gland</b>		
Thread		5 x M20 x 1.5 - 6H (Sealing by O-ring)
Clamping range	mm	7 ... 13 (without reinforcement or spinning)
Torque	Nm	12
<b>Terminals</b>		
Rigid cores	mm <sup>2</sup>	0.5 ... 4,0
Flexible cores	mm <sup>2</sup>	0.5 ... 2.5
Stripped length	mm	10
Current load cores	mm <sup>2</sup>	from 0.5 mm <sup>2</sup> , 4.9 A
<b>Information on explosion protection</b>		
Explosion protection		 Ex II 3G Ex ec nA IIC T4 Gc  Ex II 3D Ex tc IIIC T85°C Dc
Max. surface temperature:	°C	Group II: T4 Group III: T85°C
Torque cover screws	Nm	2,5

11.1 ID Plate

**ADICOS** Advanced Discovery System

MODEL	AAB-X22/X2	SERIAL	5XXXXXX	YR	20XX
ART-NR	430-2002-101	TEMP	-30 °C ≤ Ta ≤ +65 °C	IP	66
COM-NR	-	V <sub>DC</sub> / VA	60V /-	I <sub>s</sub> ≤	4,9A


 Ex II 3G      Ex ec nA IIC T4 Gc  
 Ex II 3D      Ex tc IIIC T85°C Dc

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**connection cables**

cross section  
 rigid: 0,5 - 4,0 mm<sup>2</sup>  
 flexible: 0,5 - 4,0 mm<sup>2</sup>

strip length: 10mm

Model	Device model	SERIAL	Serial number (variable)	YR	Year of production (variable)	Connection cables
ART-Nr	Article number (variable)	TEMP	Ambient temperature	IP:	Degree of protection	Cross section rigid: 0.5 ... 4.0 mm <sup>2</sup>
COM-Nr.	Communication number (variable)	V <sub>DC</sub> /VA	Voltage range / maximum power consumption	I <sub>s</sub>	Internal fusing (Short-circuit current)	flexible: 0.5 ... 4.0 mm <sup>2</sup> Strip length: 10 mm
CE marking		Information on explosion protection				

