

# ODU-MAC<sup>®</sup> BLACK-LINE

Operating and assembly instructions



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Some figures are for illustrative purposes only. Subject to change without notice. Errors and omissions excepted. We reserve the right to change our products and their technical specifications at any time in the interest of technical improvement.  
This publication supersedes all prior publications.

All the connectors shown here are connectors without breaking capacity (COC) according to IEC 61984:2008 (VDE 0627:2009-11)

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# 1. IMPORTANT INFORMATION

These assembly instructions contain important information on how to assemble and use this product safely and correctly. Read the assembly instructions carefully before assembling and using this product. Familiarize yourself with the safety information before assembling and using this product.

## 1.1 Application area

The products in the "ODU-MAC® Black-Line" family comprise a mass interconnect interface.

This is used in test and measurement engineering to test PCBs and electronically assembled units.

### Configuration and transmission options

- Electric signals
- Electric power
- High current
- High voltage
- HF signals (coax)
- Compressed air coupling
- Fluid coupling
- Shielded feedthrough / high-speed
- Vacuum
- Fiber optic
- Blank module
- PCB termination modules

## 1.2 Depiction of safety information

To make sure safe working conditions are maintained, important safety information is given in a standard format. Standard safety information is always positioned before the sequence of actions that is associated with a risk of injury or damage to equipment. Follow these measures to avoid such risks.

**Four different types of safety information are used in this document:**

 **DANGER** Type and source of the risk!  
Consequences.

► How to avoid this risk.

DANGER: Indicates a dangerous situation, which will result in death or serious injury if not avoided. This signal word is only used for extreme situations.

 **WARNING** Type and source of the risk!  
Consequences.

► How to avoid this risk.

WARNING: Indicates a dangerous situation, which may result in death or serious injury if not avoided.

 **CAUTION** Type and source of the risk!  
Consequences.

► How to avoid this risk.

CAUTION: Indicates a dangerous situation, which may result in minor to moderate injury if not avoided.

 **ATTENTION** Type and source of the risk!  
Consequences.

► How to avoid this risk.

ATTENTION: Indicates a dangerous situation, which will result in damage to property if not avoided.

 **NOTICE** Indicates additional information and recommendations.

## 2. INTENDED USE

The ODU-MAC® Black-Line contact system is solely intended for the use defined in these ODU assembly instructions and described in the associated technical documents.

The specific modules used in each case, and how they are combined, determine the technical limits of use. They can be taken from the specifications contained in these ODU assembly instructions and the relevant product catalog.

Compliance with all the specifications outlined in these ODU assembly instructions falls within the scope of intended use. The ODU-MAC® Black-Line contact system has been designed according to the state of the art and in line with the latest safety requirements.

### 2.1 Structure of ODU-MAC® Black-Line

The ODU-MAC® Black-Line contact system basically consists of a receiver and an interchangeable test adapter (ITA).

- The receiver is intended for installation in fixed systems such as test boards or machines.
- The adapter (ITA) is installed in a mobile component.

### 2.2 Foreseeable misuse

The following are classed as misuse and do not comply with intended use:

- Use of ODU-MAC® Black-Line for any purpose other than contacting connectors
- Overloading of ODU-MAC® Black-Line
- Incorrect or incomplete assembly
- Operation with modifications, e.g., extension of the operating lever
- Operation with covers, housing or safety devices removed
- Operation with components not intended for this purpose
- Use with an impermissible power supply
- Use with impermissible spare parts
- Incorrect cleaning
- Use in an unsuitable environment
- Operation by untrained individuals
- Lack of maintenance or cleaning

## 2.3 Personnel qualifications

### 2.3.1 Design and integration of ODU-MAC® Black-Line into the terminal device

ODU-MAC® Black-Line must be designed and integrated into the terminal device by qualified skilled personnel (electricians) who, based on their training and experience, are able to assess the specific risks associated with the application at hand and to introduce suitable measures to minimize said risks.

### 2.3.2 Service, maintenance, and commissioning

ODU-MAC® Black-Line must be commissioned, assembled, installed, serviced, and maintained by qualified skilled personnel (maintenance personnel or technicians) who, based on their training, experience, and instruction, as well as their knowledge of the applicable standards, specifications, accident prevention regulations, and operating conditions, are authorized to perform the necessary tasks and able to recognize and avoid the associated potential risks.

#### Tasks required during service, maintenance, and commissioning are:

- ▶ Selection, positioning, wiring, and assembly of connectors and selection, positioning, and assembly of slot covers
- ▶ Assembly and disassembly of the receiver/adapter (ITA) and accessories
- ▶ Opening of the receiver via emergency release
- ▶ Adapter (ITA) assembly
- ▶ Receiver assembly
- ▶ Troubleshooting, component repair
- ▶ Maintenance and cleaning

### 2.3.3 Operation

This device is intended for use by trained operators once it has been installed and fully assembled.

The operator must have read and understood these ODU assembly instructions in full or had the instructions explained to them.

#### Tasks required during operation are:

- ▶ Selection of the correct adapter (ITA)
- ▶ Placement of the adapter (ITA) in the locking position
- ▶ Start of the locking/unlocking procedure
- ▶ Adapter (ITA) removal

# 3. GENERAL SAFETY INFORMATION

The ODU-MAC® Black-Line contact system has been designed according to the state of the art and in line with the latest safety requirements. However, residual risks do remain, which mean personnel must act with caution.

Below is a list of these residual risks, along with the conduct and measures required to mitigate them.

## 3.1 Danger from electric current

**⚠ DANGER** Danger from electric current!

**Touching live parts in the event of a fault can lead to an electric shock.**

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Always operate the device with the protective conductor connected.
- ▶ Visually inspect the components for damage at regular intervals.
- ▶ De-energize the device before working on the contact system.
- ▶ Take additional safety precautions to prevent restarting throughout the whole system.
- ▶ Wear personal protective equipment.
- ▶ Use additional protective equipment as appropriate for the work at hand.
- ▶ Only remove and insert connectors when the device is de-energized.
- ▶ Only ever perform assembly, installation, repair, and maintenance work when the device is de-energized.
- ▶ Use the protective covers supplied to close off empty slots.

**⚠ DANGER** Danger from transmitting electric current and producing electric arcs!

**Touching live connectors can lead to an electric shock. If electric arcs are produced, they can result in injury caused by fire or by molten parts being ejected, and in an electric shock.**

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Only remove and insert connectors when the device is de-energized.
- ▶ Only use connectors according to specifications.
- ▶ Wear personal protective equipment.
- ▶ Use additional protective equipment as appropriate for the work at hand.

**⚠ DANGER** Danger from electric energy stored in components such as capacitors or inductors (e.g., relays, motors)!  
**Touching live components can lead to an electric shock.**

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Wear personal protective equipment.
- ▶ Use additional protective equipment as appropriate for the work at hand.
- ▶ Observe additional safety precautions throughout the whole system during automatic operation.
- ▶ Provide emergency-stop functions in the higher-level system.

## 3.2 Risk of accident

**⚠ WARNING** Risk of accident from damaged connectors!

**If you drop a connector, this could damage it.**

**Damaged connectors can cause accidents and represent a risk.**

- ▶ Never use damaged connectors (e.g., housing, insulators, contacts).

**⚠ WARNING** Risk of tipping from control cabinet having an incorrect center of gravity!

**If the control cabinet tips/falls over, this can cause injury, e.g., by crushing personnel.**

- ▶ When assembling the receiver in the control cabinet, make sure the control cabinet's center of gravity is stable.
- ▶ Take the additional weight of installed equipment such as the adapter (ITA), platform, slide mount, and attached cables into account.

### 3.3 Risk of explosion



#### WARNING

**Risk of explosion from an improperly treated capacitor!**

Explosions can damage hearing. Injuries may also be sustained from parts flying through the air and from the effects of personnel being startled (and subsequently collapsing, for example).

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Wear personal protective equipment.

### 3.4 Risk of burns



#### CAUTION

**Risk of burns from surfaces that become hot during operation!**

**Touching components that become hot during operation, e.g., connectors or the housing, without protection can cause burns.**

- ▶ Do not touch the hot connectors without protection.
- ▶ Wear personal protective equipment.
- ▶ Use additional protective equipment as appropriate for the work at hand.
- ▶ Select which ODU-MAC® Blue-Line contacts to install based on the available amperages. When powered in the nominal current range, temperatures of up to 85 °C can occur at the contacts themselves. The permissible nominal current can be modified accordingly to avoid these excessive temperatures.



#### WARNING

**Danger from conveying media such as liquids and gases!**

**Touching components that become hot during operation, e.g., connectors or the housing, without protection can cause burns.**

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Only remove and insert connectors according to their specifications.
- ▶ Only use connectors according to their specifications, particularly as regards permissible fluids and pressures.
- ▶ Do not use connectors close to open flames or in excessively hot environments or atmospheres with an oxygen content of over 25%; rather, only use them within the range stated in the specifications.
- ▶ Never use flammable or explosive gases or liquids.
- ▶ Only use strongly corrosive, caustic or alkaline liquids or gases after coordinating with the manufacturer regarding technical issues.
- ▶ Wear personal protective equipment (suitable safety goggles).
- ▶ Use additional protective equipment as appropriate for the work at hand.

### 3.5 Risk of injury



#### **WARNING**

**Danger from transmitting optical (laser) radiation via connectors!**

**Laser radiation can cause injury, particularly to the eyes.**

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Wear personal protective equipment (suitable safety goggles).
- ▶ Use additional protective equipment as appropriate for the work at hand.
- ▶ Only remove and insert connectors if they are not transmitting optical radiation.
- ▶ Only remove and insert connectors according to their specifications.
- ▶ Only use connectors according to specifications.



#### **WARNING**

**Danger from improper assembly or overloading of components!**

**Falling and/or breaking components can cause injury.**

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Take note of the assembly information contained in these instructions.
- ▶ Comply with the maximum load limits.
- ▶ Visually inspect the components at regular intervals.
- ▶ Maintain the components at regular intervals.
- ▶ Only use mounting materials according to the specifications in these instructions.
- ▶ Only use genuine spare parts.



#### **CAUTION**

**Risk of injury from sharp edges and corners!**

**Sharp edges and corners can cause abrasions and cuts.**

- ▶ Be careful when working near to sharp edges and corners.
- ▶ Wear personal protective equipment.



#### **WARNING**

**Danger from working within the range of a spring under tension!**

- ▶ Wear personal protective equipment (suitable safety goggles).



#### **CAUTION**

**Risk of crushing from tightening mechanism!**

**Hands may become crushed between the receiver and adapter (ITA).**

- ▶ Make sure the travel path of the tightening mechanism is unobstructed before operating it.



#### **CAUTION**

**Weight of the adapter may be too heavy for the operator when using the device without a platform.**

- ▶ Observe occupational health and safety regulations.
- ▶ Use additional aids.

### 3.6 Safety label

**NOTICE** Do not remove the safety label!

The following safety symbols are attached to all receivers:



#### Warning of hand injuries

Risk of crushing injuries, particularly of the hands.



#### Follow assembly instructions

Read these assembly instructions before assembling, commissioning, maintaining, and using this device.

### 3.7 Rating plates

**NOTICE** Do not modify or remove the rating plate.

The figures show sample ODU-MAC® Black-Line rating plates.

#### 3.7.1 12-Flex FOUR A Receiver rating plate

 <b>ODU GmbH &amp; Co. KG</b> Pregelstraße 11, 84453 Mühldorf a. Inn	
ODU-MAC® Black-Line Kontaktierungssystem für Prüfsysteme 12-Flex FOUR A Receiver      Artikel-Nr. 24 V DC Baujahr:                              SN:	

#### 3.7.3 12-Flex FOUR A Adapter rating plate

 <b>ODU GmbH &amp; Co. KG</b> Pregelstraße 11, 84453 Mühldorf a. Inn	
ODU-MAC® Black-Line Kontaktierungssystem für Prüfsysteme Artikel-Nr.                              SN:	12-Flex FOUR A Adapter Baujahr:

#### 3.7.2 12-Flex TWO M Receiver rating plate

 <b>ODU GmbH &amp; Co. KG</b> Pregelstraße 11, 84453 Mühldorf a. Inn	
ODU-MAC® Black-Line Kontaktierungssystem für Prüfsysteme 12-Flex TWO M Receiver Artikel-Nr. Baujahr: SN:	

#### 3.7.4 12-Flex TWO M Adapter rating plate

 <b>ODU GmbH &amp; Co. KG</b> Pregelstraße 11, 84453 Mühldorf a. Inn	
ODU-MAC® Black-Line Kontaktierungssystem für Prüfsysteme Artikel-Nr.                              SN:	12-Flex TWO M Adapter Baujahr:

### 3.8 Position of the safety label and rating plate

#### 3.8.1 Position on the 12-Flex FOUR A Receiver

Fig. 1

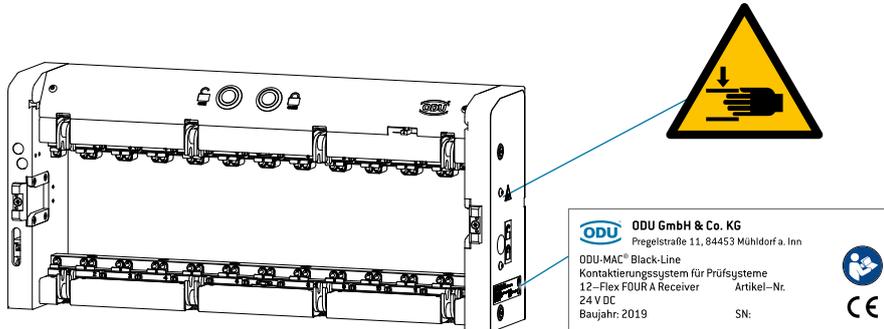
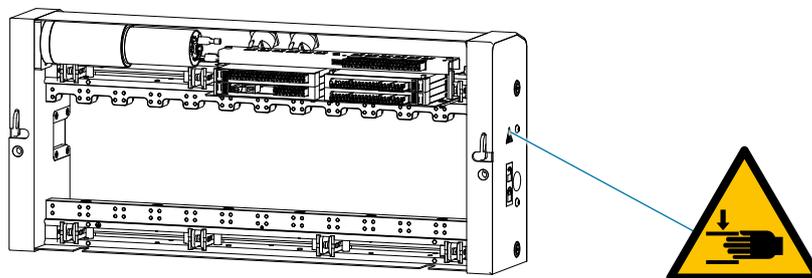


Fig. 2



#### 3.8.2 Position on the 12-Flex TWO M Receiver

Fig. 3

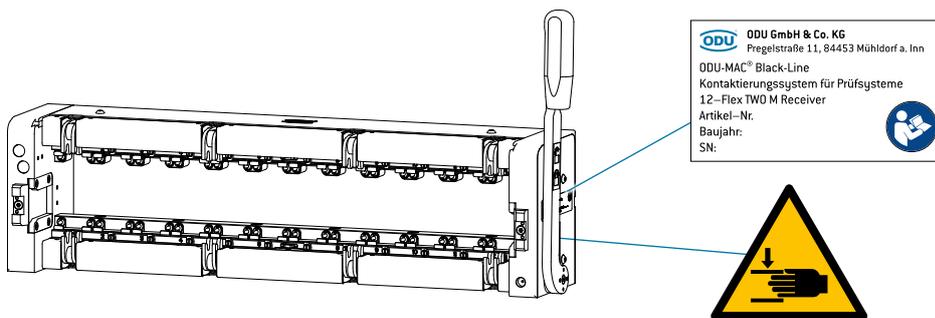
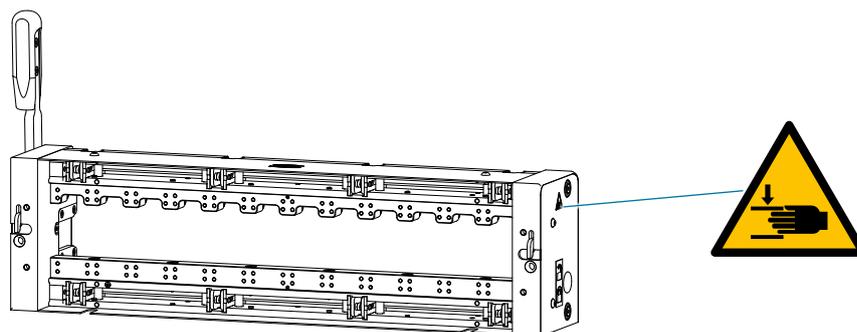
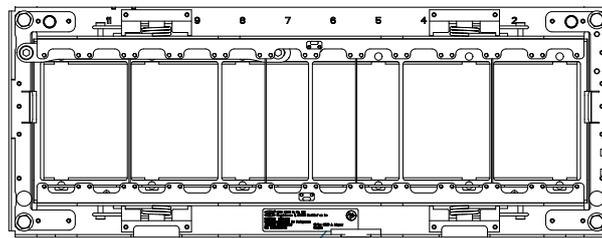


Fig. 4



### 3.8.3 Position on the 12-Flex FOUR A Adapter

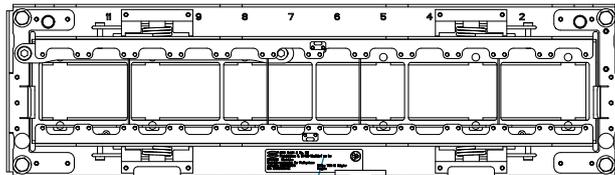
Fig. 5



**ODU** ODU GmbH & Co. KG  
Pregelstraße 11, 84453 Mühldorf a. Inn  
ODU-MAC® Black-Line  
Kontaktierungssystem für Prüfsysteme Artikel-Nr. 12-Flex FOUR A Adapter Baujahr:  
SN: 

### 3.8.4 Position on the 12-Flex TWO M Adapter

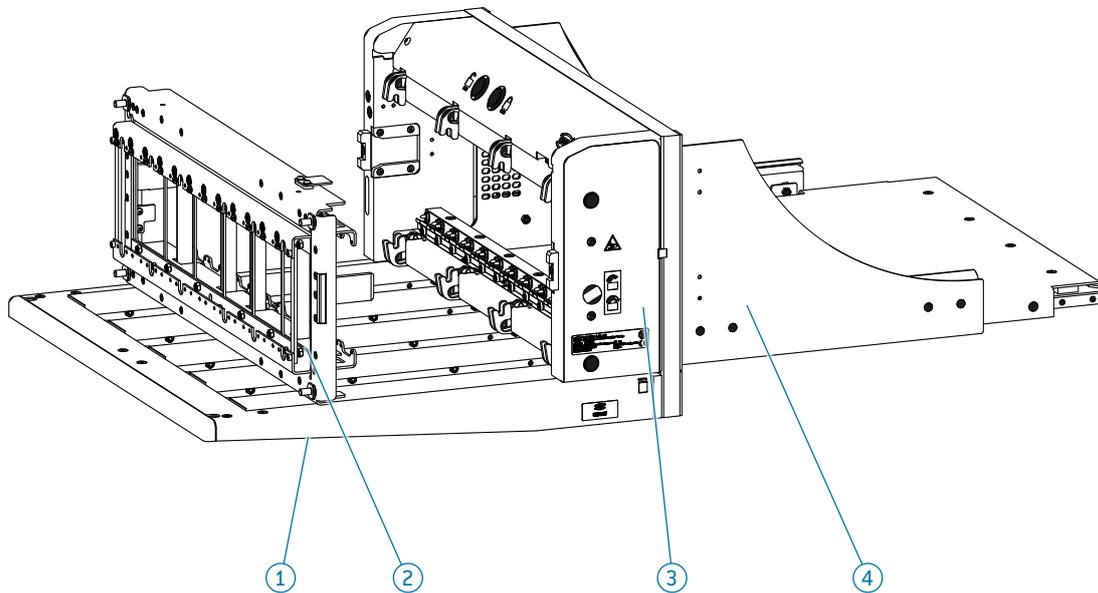
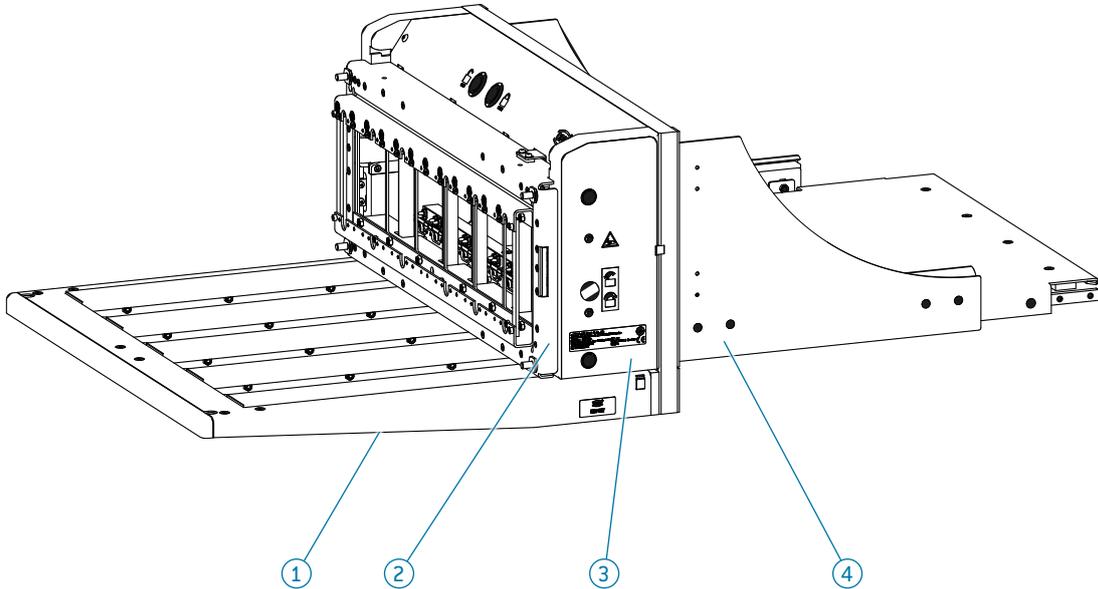
Fig. 6



**ODU** ODU GmbH & Co. KG  
Pregelstraße 11, 84453 Mühldorf a. Inn  
ODU-MAC® Black-Line  
Kontaktierungssystem für Prüfsysteme Artikel-Nr. 12-Flex TWO M Adapter Baujahr:  
SN: 

# 4. DESCRIPTION AND FUNCTION

## 4.1 Device layout: 12-Flex FOUR A Receiver with slide mount and platform



① 12-Flex TWO/FOUR 15" Platform

② 12-Flex FOUR A Adapter

③ 12-Flex FOUR A Receiver

④ 12-Flex FOUR A Receiver slide mount with platform flange

## 4.2 Device layout: 12-Flex TWO M Receiver with slide mount, without platform flange

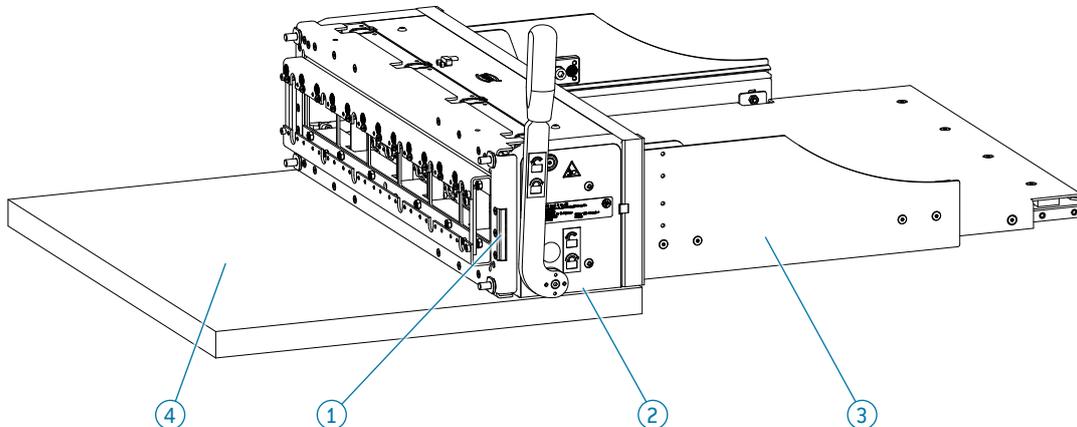


Fig. 9

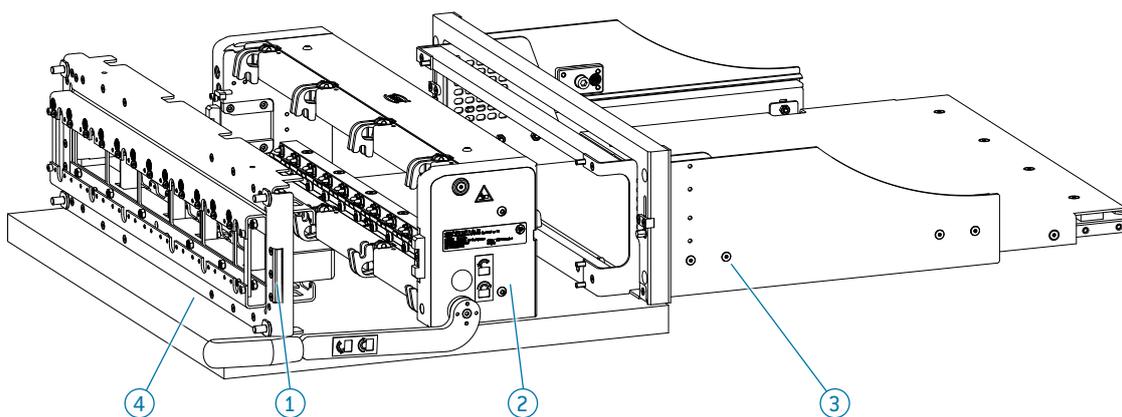


Fig. 10

- ① 12-Flex TWO M Adapter
- ② 12-Flex TWO M Receiver
- ③ 12-Flex TWO M Receiver slide mount without platform flange
- ④ Customer platform solution (mandatory if no ODU platform solution used!)

### 4.3 Device layout: 12-Flex TWO M Tabletopcover and platform

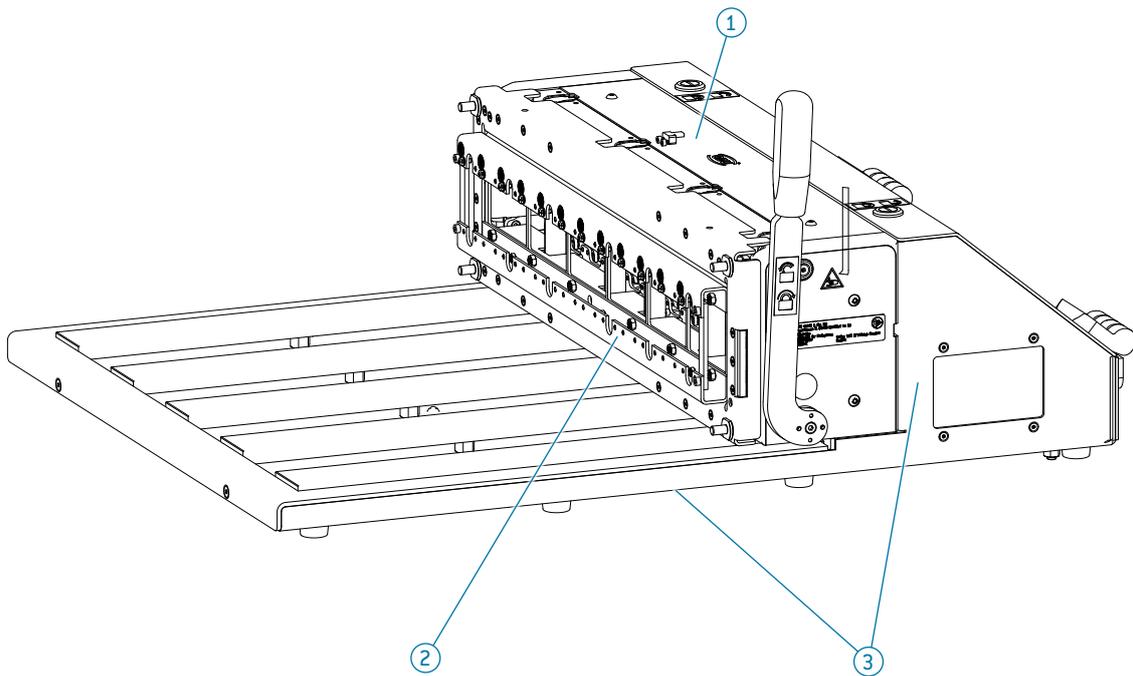


Fig. 11

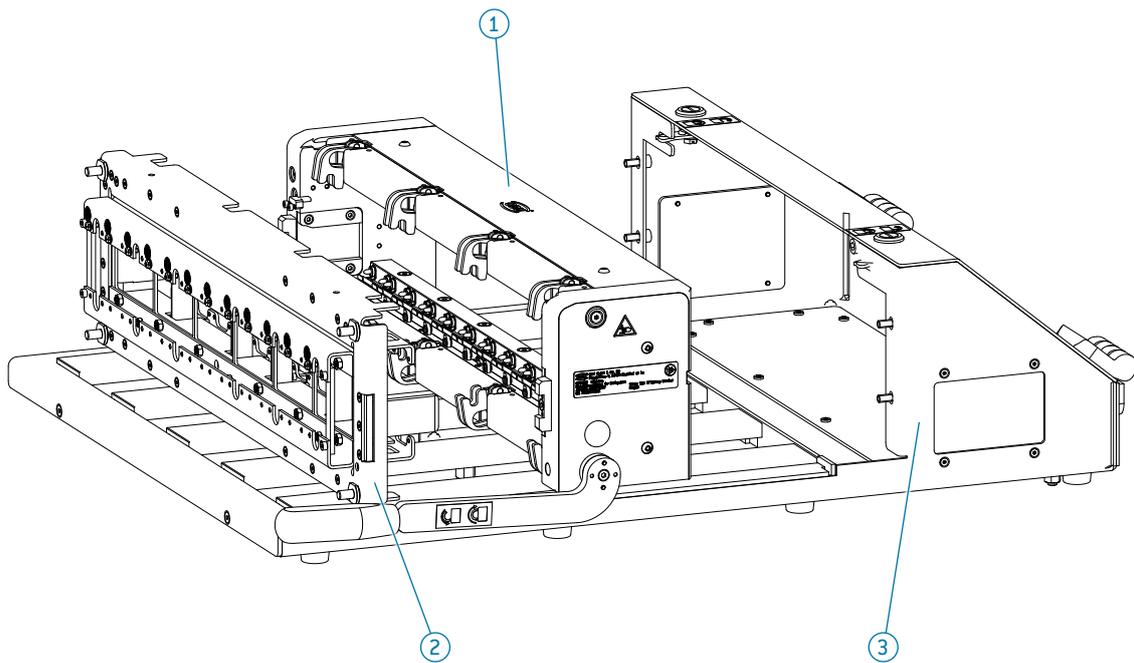


Fig. 12

① 12-Flex TWO M Tabletop receiver

③ 12-Flex TWO M Tabletopcover and platform

② 12-Flex TWO M Adapter

#### 4.4 12-Flex FOUR A Receiver front view

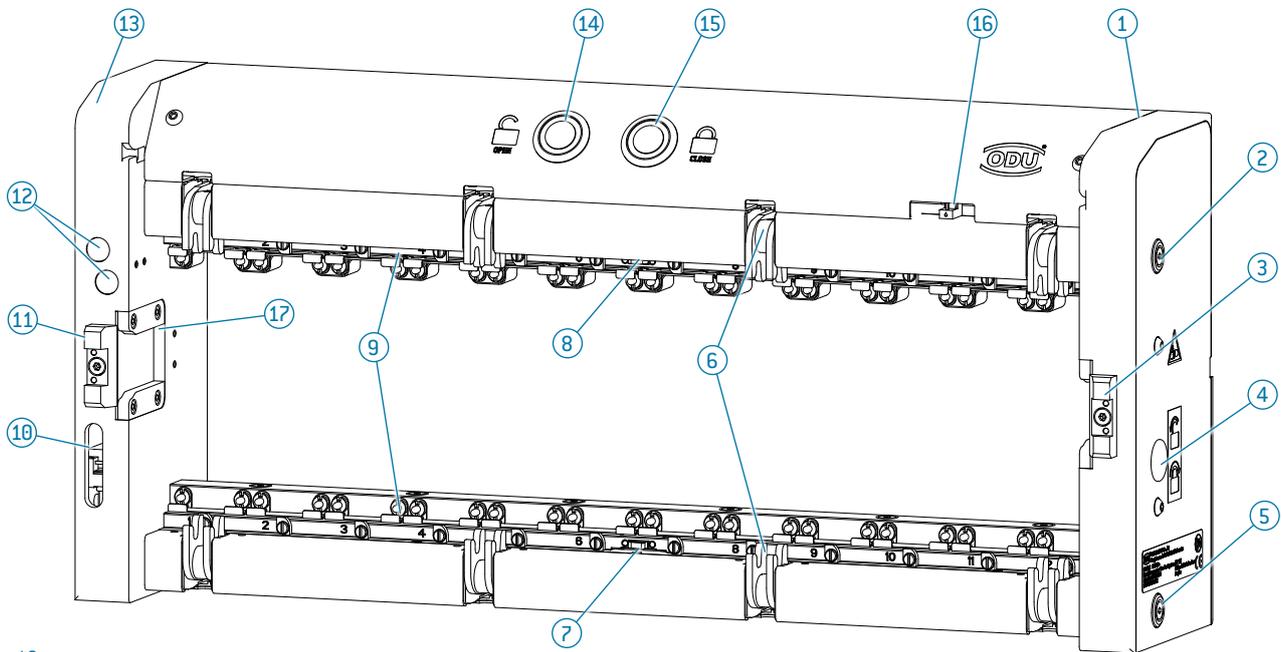


Fig. 13

- |  |                                |
|--|--------------------------------|
| ① Right side panel                                     | ⑩ Fork light barrier 2 (Side)  |
| ② Top right emergency release                          | ⑪ Left pre-centering piece     |
| ③ Right pre-centering piece                            | ⑫ Resistance coding (Optional) |
| ④ Service access (Lock)                                | ⑬ Left side panel              |
| ⑤ Bottom right emergency release                       | ⑭ Unlock (Open) button         |
| ⑥ Locking hook   | ⑮ Lock (Close) button          |
| ⑦ Bottom condition-monitoring microswitch 1 (Optional) | ⑯ Fork light barrier 1 (Top)   |
| ⑧ Top condition-monitoring microswitch 2 (Optional)    | ⑰ Centering blade holder       |
| ⑨ Slot 1 – 12 including frame fixture                  |                                |

## 4.5 12-Flex FOUR A Receiver rear view

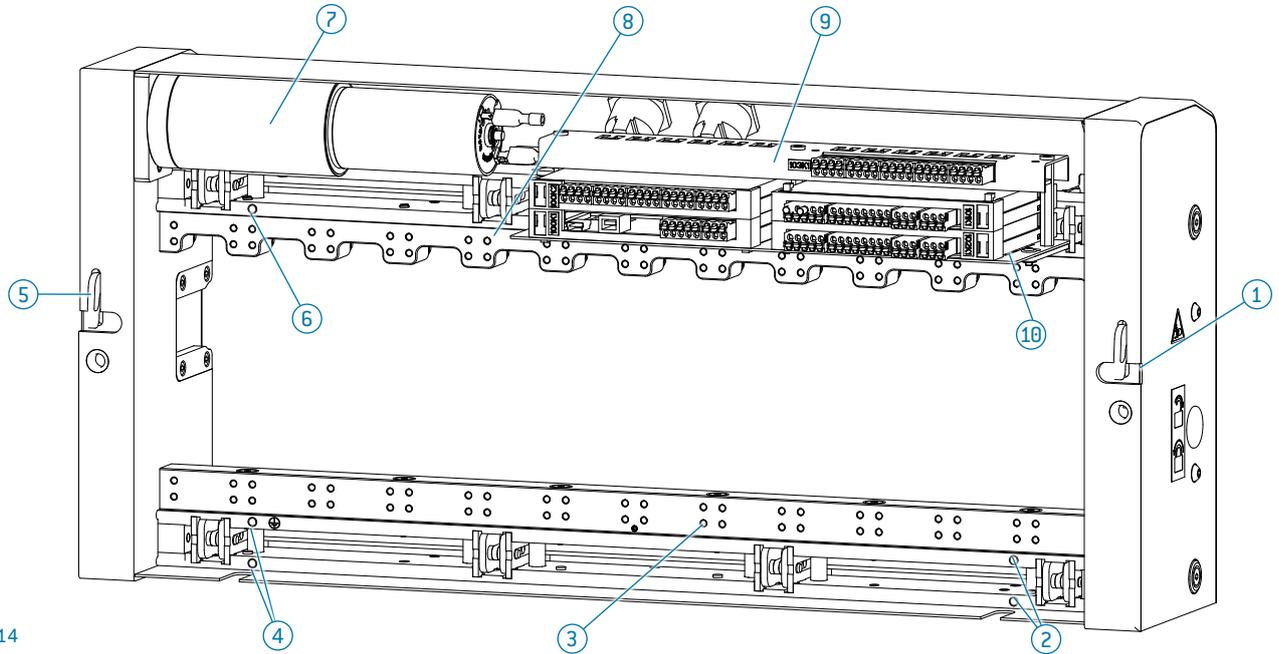


Fig. 14

- |  |   |
|--|---|
| ① Left locking hook for service access     | ⑥ Top right receiver fixing point         |
| ② Bottom left receiver fixing points       | ⑦ Drive unit (motor)                      |
| ③ Bottom strain-relief plate fixing points | ⑧ Top strain-relief plate fixing points   |
| ④ Bottom right receiver fixing points      | ⑨ Controller                              |
| ⑤ Right locking hook for service access    | ⑩ Top left receiver fixing point (hidden) |

## 4.6 12-Flex TWO M Receiver front view

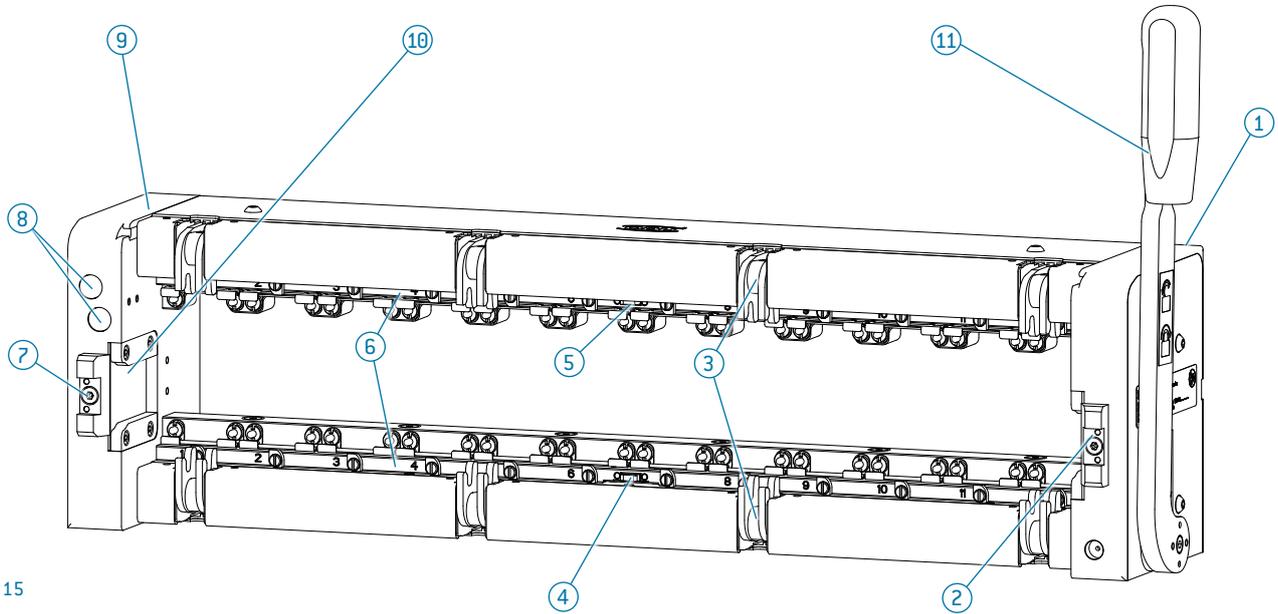


Fig. 15

- |  |                                |
|--|--------------------------------|
| ① Right side panel                                   | ⑦ Left pre-centering piece     |
| ② Right pre-centering piece                          | ⑧ Resistance coding (optional) |
| ③ Locking hook                                       | ⑨ Left side panel              |
| ④ Bottom condition-monitoring microswitch (optional) | ⑩ Left centering blade holder  |
| ⑤ Top condition-monitoring microswitch (optional)    | ⑪ Hand lever                   |
| ⑥ Slot 1 – 12 including frame fixture                |                                |

## 4.7 12-Flex TWO M Receiver rear view

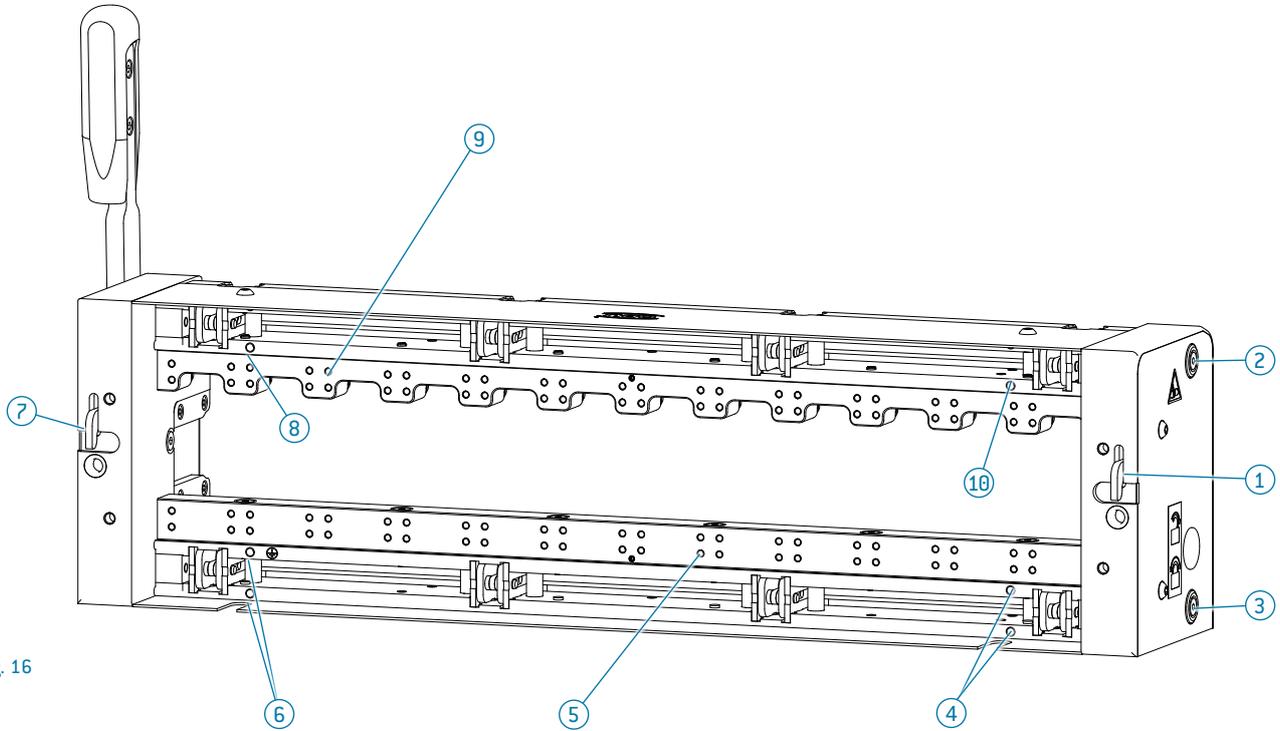


Fig. 16

- |  |   |
|--|---|
| ① Left locking hook for service access     | ⑥ Bottom right receiver fixing points   |
| ② Top left emergency release               | ⑦ Right locking hook for service access |
| ③ Left service access                      | ⑧ Top right receiver fixing point       |
| ④ Bottom left receiver fixing points       | ⑨ Top strain-relief plate fixing points |
| ⑤ Bottom strain-relief plate fixing points | ⑩ Top left receiver fixing point        |

## 4.8 12-Flex TWO M Tabletop receiver front view

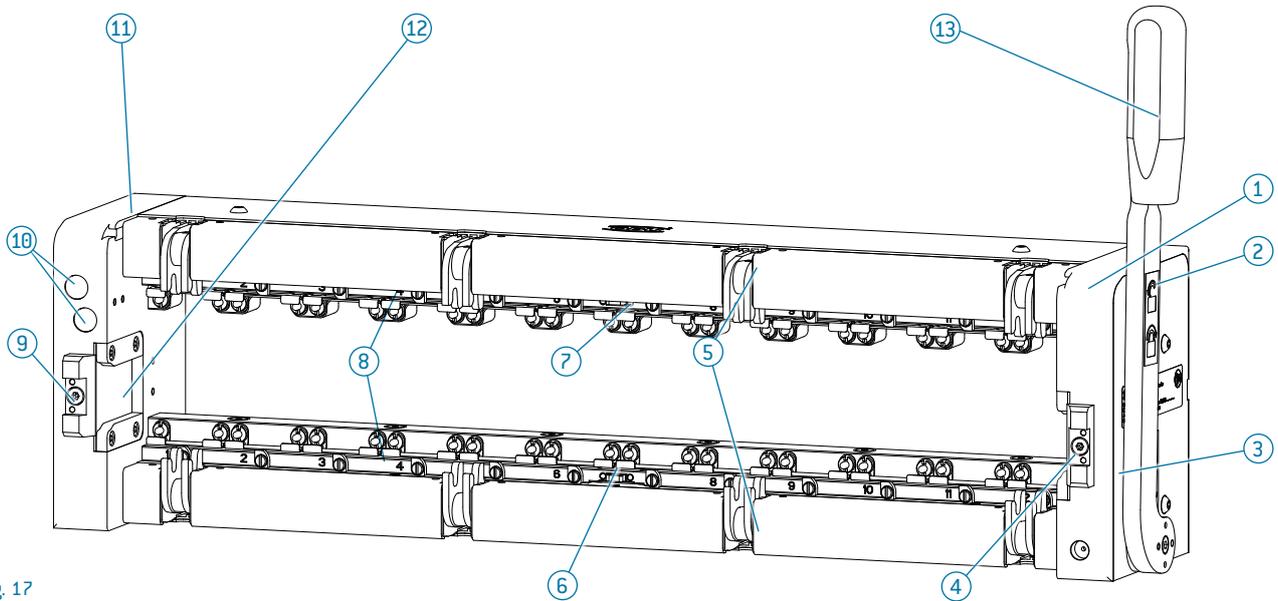


Fig. 17

- |  |                                       |
|--|---------------------------------------|
| ① Right side panel                                   | ⑧ Slot 1 – 12 including frame fixture |
| ② Top right emergency-release screw (hidden)         | ⑨ Left pre-centering piece            |
| ③ Service access                                     | ⑩ Resistance coding (optional)        |
| ④ Right pre-centering piece                          | ⑪ Left side panel                     |
| ⑤ Locking hook                                       | ⑫ Left centering blade holder         |
| ⑥ Bottom condition-monitoring microswitch (optional) | ⑬ Hand lever                          |
| ⑦ Top condition-monitoring microswitch (optional)    |                                       |

## 4.9 12-Flex TWO M Tabletop receiver rear view

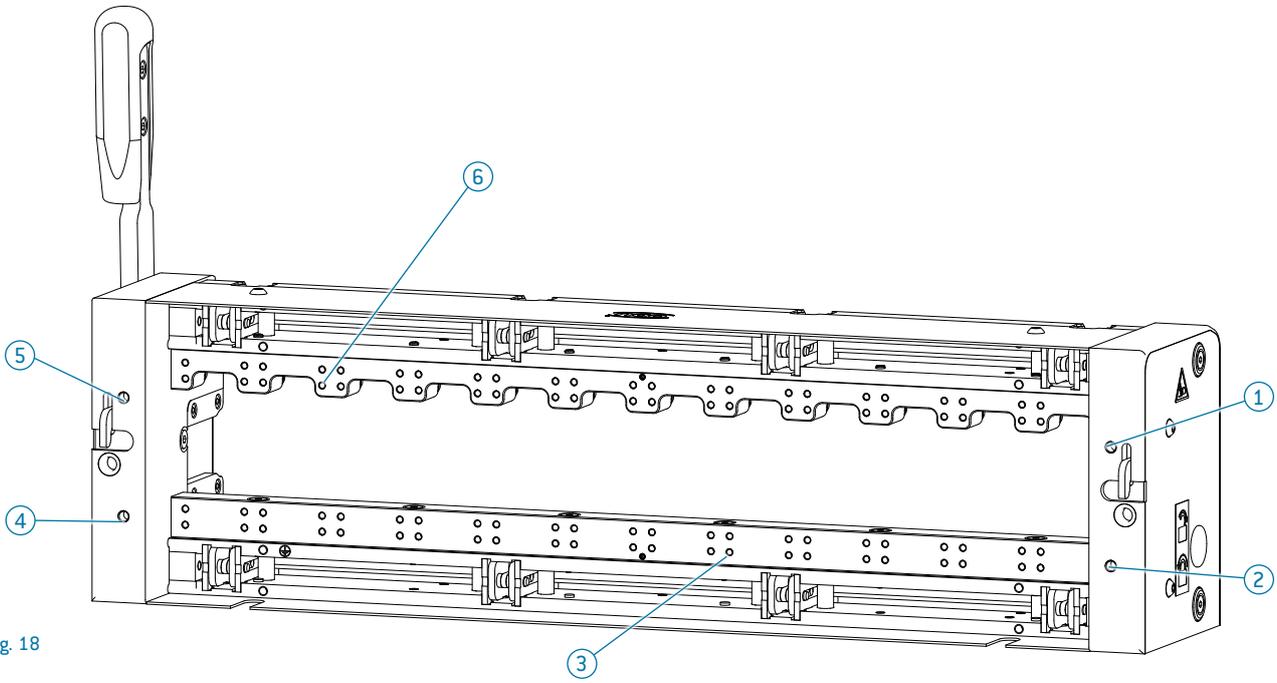


Fig. 18

- ① Top left fixing point for tabletop housing
- ② Bottom left fixing point for tabletop housing
- ③ Bottom strain-relief plate fixing points
- ④ Bottom right fixing point for tabletop housing
- ⑤ Top right fixing point for tabletop housing
- ⑥ Top strain-relief plate fixing points

## 4.10 12-Flex TWO M Tabletop housing front view

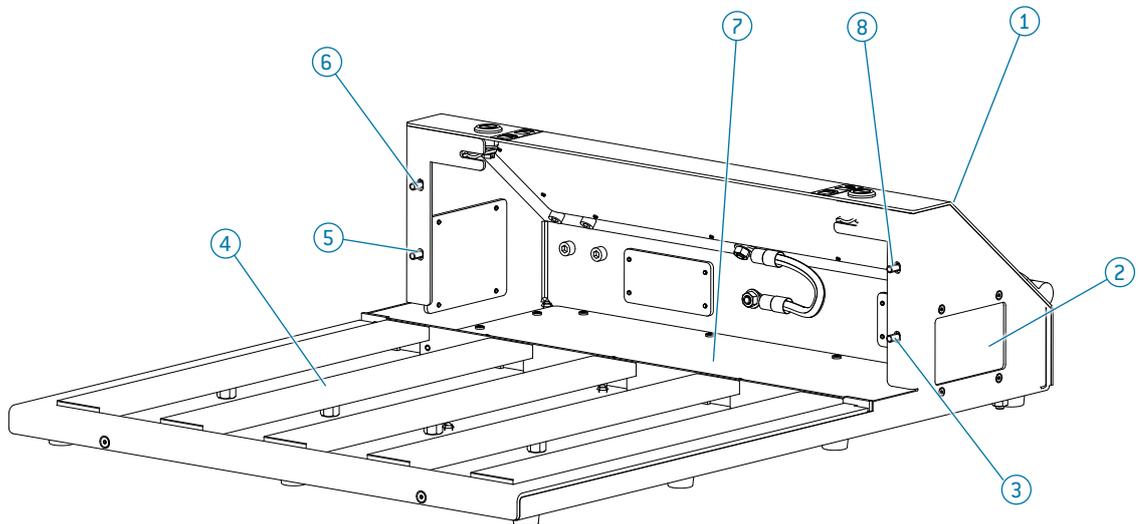


Fig. 19

- ① Tabletop housing
- ② Right side cable outlet
- ③ Bottom right receiver fixing point
- ④ Guiding rails
- ⑤ Bottom left receiver fixing point
- ⑥ Top left receiver fixing point
- ⑦ Bottom cable outlet
- ⑧ Top right receiver fixing point

## 4.11 12-Flex TWO M Tabletop housing rear view

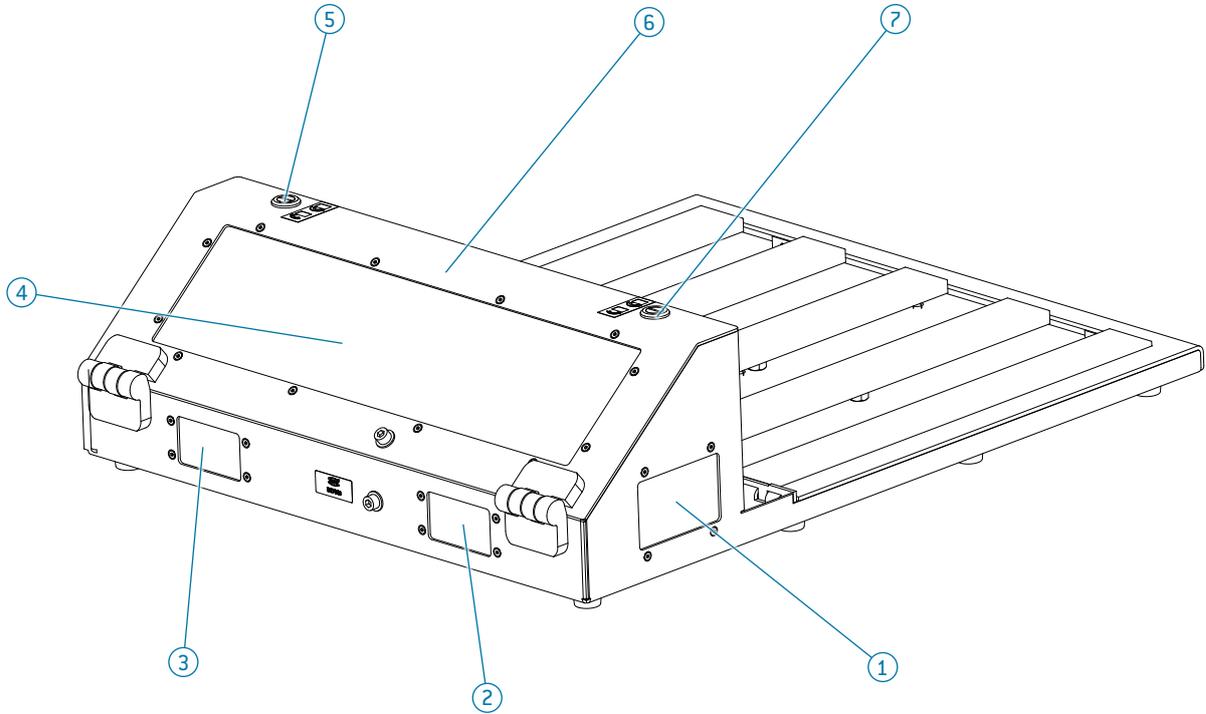


Fig. 20

- |                           |                           |
|---------------------------|---------------------------|
| ① Left side cable outlet  | ⑤ Right service flap lock |
| ② Rear left cable outlet  | ⑥ Service flap            |
| ③ Rear right cable outlet | ⑦ Left service flap lock  |
| ④ Central cable outlet    |                           |

## 4.12 12-Flex Four A Adapter front view

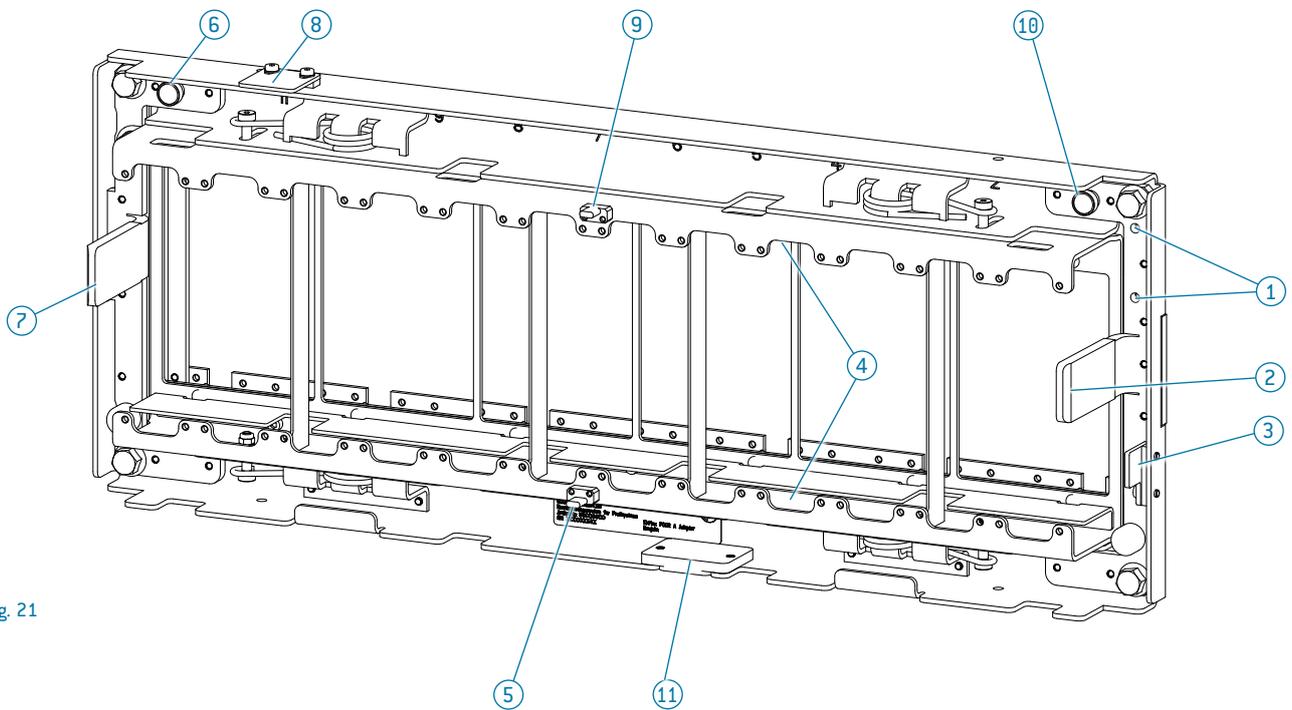


Fig. 21

- |   |   |
|---|---|
| ① Installation holes for Resistor coding (optional) | ⑦ Left centering blade                    |
| ② Right centering blade                             | ⑧ Actuator lug                            |
| ③ Actuator lug                                      | ⑨ Top condition-monitoring actuator pin   |
| ④ Slot 1 – 12                                       | ⑩ Magnet for protective cover right       |
| ⑤ Bottom condition-monitoring actuator pin          | ⑪ Mounting position for optional RFID TAG |
| ⑥ Magnet for protective cover left                  |   |

## 4.13 12-Flex Four A Adapter rear view

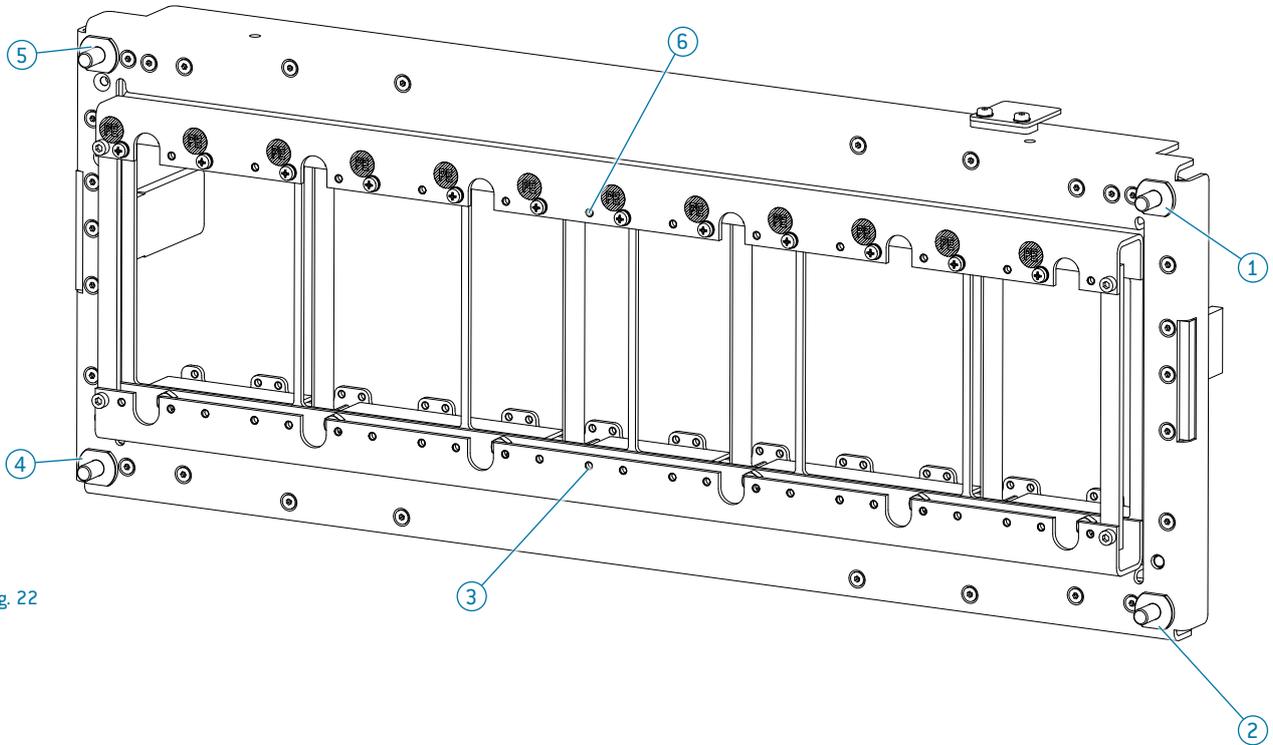


Fig. 22

- ① Top left adapter (ITA) fixing point
- ② Bottom left adapter (ITA) fixing point
- ③ Bottom strain-relief plate fixing points
- ④ Bottom right adapter (ITA) fixing point
- ⑤ Top right adapter (ITA) fixing point
- ⑥ Top strain-relief plate fixing points

#### 4.14 12-Flex FOUR Enclosure 9" front view

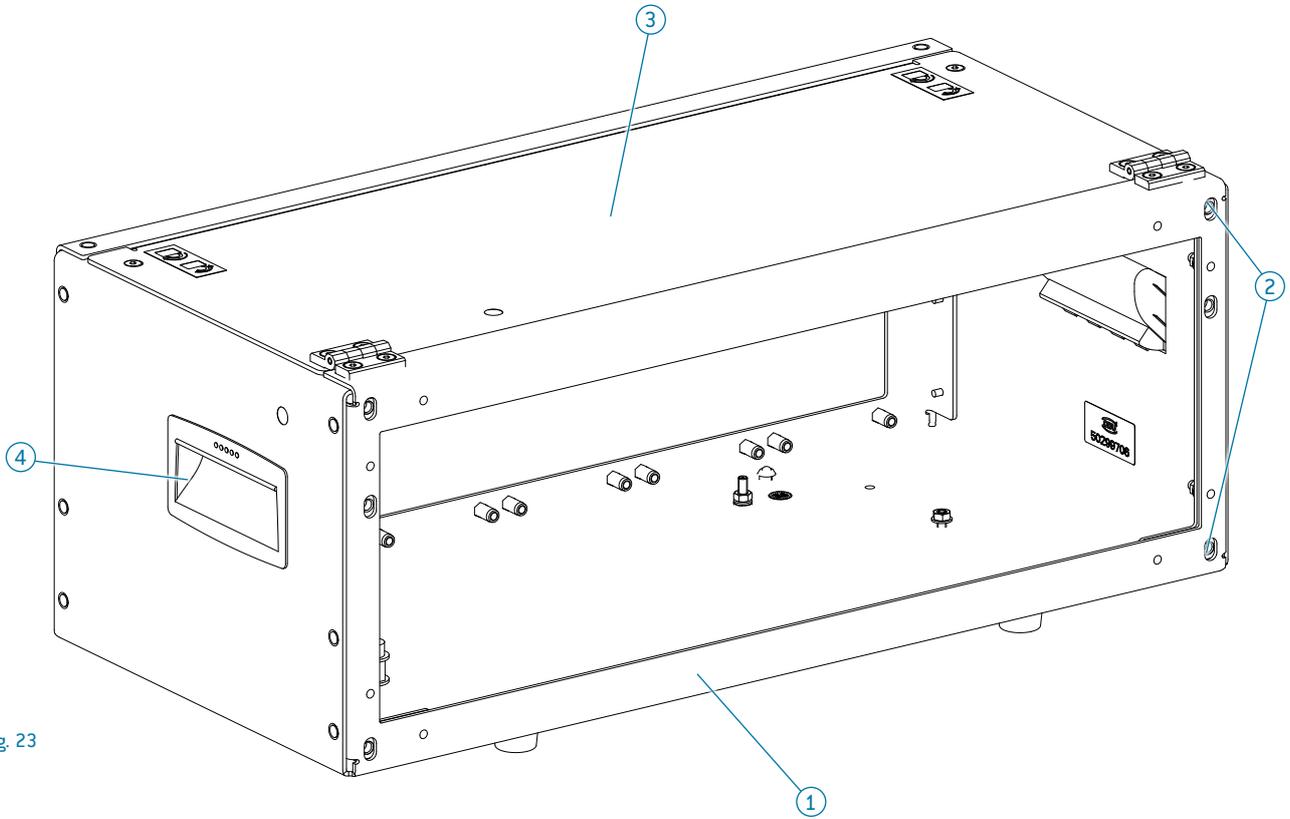


Fig. 23

- ① Adapter mounting surface
- ② Thread M6
- ③ Service flap
- ④ Recessed grip

#### 4.15 12-Flex FOUR Enclosure 9" rear view

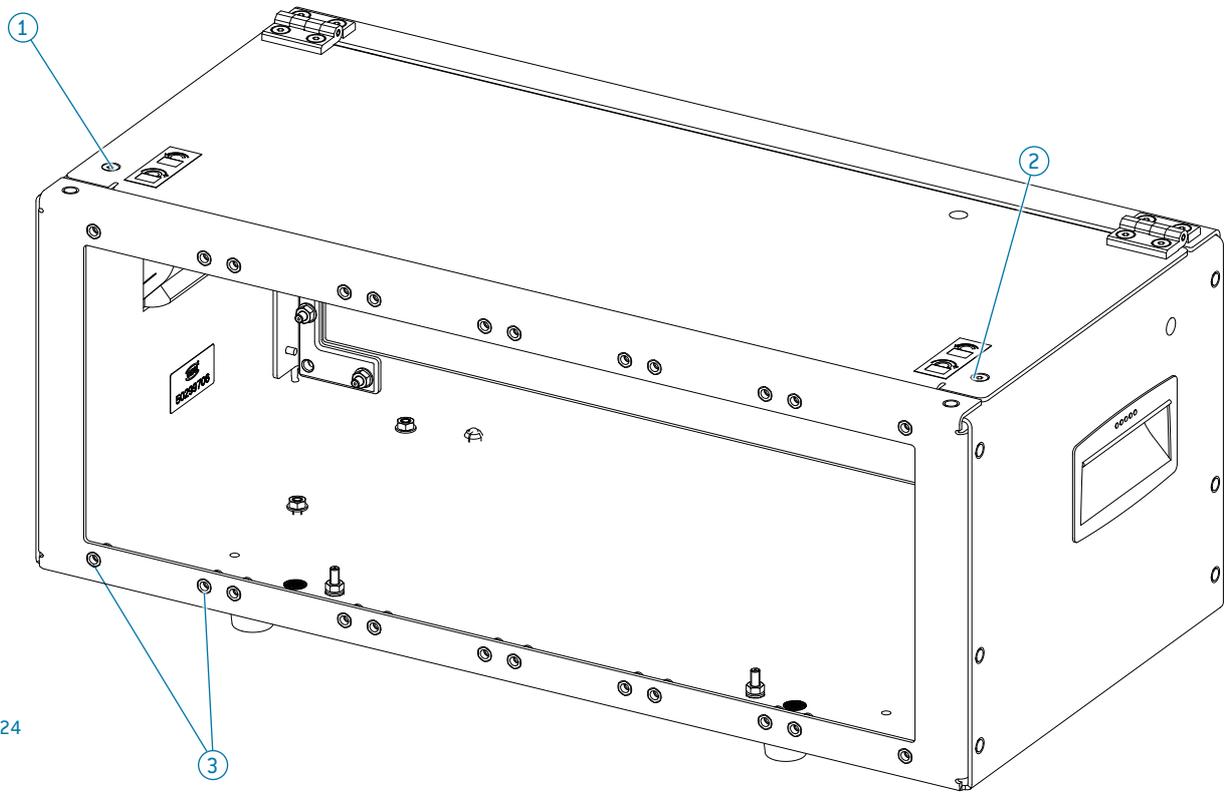


Fig. 24

- ① Left service flap lock
- ② Right service flap lock
- ③ Mounting thread for flange plates

# 5. TECHNICAL DATA

## 5.1 Receiver technical data

**NOTICE** If the maximum operating temperature is exceeded, the customer must incorporate additional cooling into the control cabinet.

**NOTICE** The rear of the receiver must be protected against ingress in line with IP20 (protection against solid objects >12.5 mm, for use in dry areas).

### 5.1.1 12-Flex FOUR A Receiver (electric receiver)

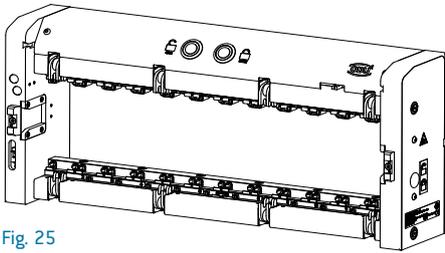


Fig. 25

Variants / Part number	637.011.412.000.001	637.011.412.001.001	637.011.412.003.001	637.011.412.002.001
Condition monitoring	-	•	•	-
Resistance coding	-	-	•	•

Dimensions	482 x 222 x 98 mm
Weight	7,400 g
Supply voltage	24 V DC power supply safe against return feed with a minimum capacity (within the power supply or external) of 6600 µF (Class 2 for UL)
Current/power consumption	Max. 2 A (without inrush peak)
Power supply requirement (provided by customer)	Power cable no longer than 3 m
Connectors to use	ODU-MAC® Blue-Line/Black-Line size 4
Number of connectors	Max. 12 ODU-MAC® Blue-Line/Black-Line size 4 connectors
Storage temperature	-20...+85 °C
Operating temperature	0...+55 °C
Protection class	IP20 in mated condition
Service life, mating cycles	Mechanism/drive: 20,000 operation cycles (1 cycle = 1x open + 1x close)
Permissible pollution degree	3
Air humidity	0 to 80 % r. h., non-condensing
Maximum weight of adapter (ITA) to use	30 kg
Safety	An emergency-stop function must be provided in the higher-level system.

### 5.1.2 12-Flex TWO M Receiver (manual receiver)

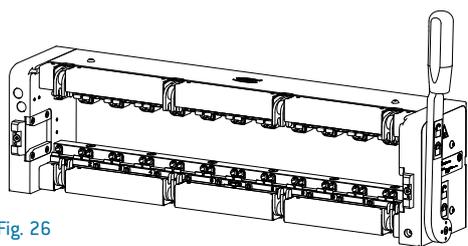


Fig. 26

Variants / Part number	637.012.212.000.001	637.012.212.001.001	637.012.212.003.001	637.012.212.002.001
Condition monitoring	–	•	•	–
Resistance coding	–	–	•	•

Dimensions	482 x 133 x 98 mm
Weight	4,860 g
Connectors to use	ODU-MAC® Blue-Line/Black-Line size 2
Number of connectors	Max. 12 ODU-MAC® Blue-Line/Black-Line size 2 connectors
Storage temperature	–20...+85 °C
Operating temperature	0...+55 °C
Protection class	IP20 in mated condition
Service life, mating cycles	Mechanism/drive: 20,000 operation cycles (1 cycle = 1x open + 1x close)
Permissible pollution degree	3
Air humidity	0 to 80 % r. h., non-condensing
Maximum weight of adapter (ITA) to use	30 kg

### 5.1.3 12-Flex TWO M Tabletop receiver (manual receiver)

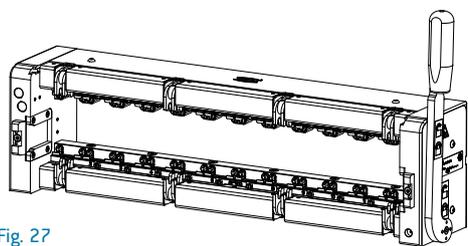


Fig. 27

Variants / Part number	637.032.212.000.001	637.032.212.001.001	637.032.212.003.001	637.032.212.002.001
Condition monitoring	–	•	•	–
Resistance coding	–	–	•	•

Dimensions	482 x 133 x 98 mm
Weight	4,770 g
Connectors to use	ODU-MAC® Blue-Line/Black-Line size 2
Number of connectors	Max. 12 ODU-MAC® Blue-Line/Black-Line size 2 connectors
Storage temperature	–20...+85 °C
Operating temperature	0...+55 °C
Protection class	IP20 in mated condition
Service life, mating cycles	Mechanism/drive: 20,000 operation cycles (1 cycle = 1x open + 1x close)
Permissible pollution degree	3
Air humidity	0 to 80 % r. h., non-condensing
Maximum weight of adapter (ITA) to use	30 kg

## 5.2 12-Flex TWO M Tabletopcover and platform technical data

**NOTICE** The cable outlets in the tabletop housing must be protected against ingress in line with IP20 (protection against solid objects >12.5 mm, for use in dry areas).

### 5.2.1 12-Flex TWO M Tabletopcover and platform

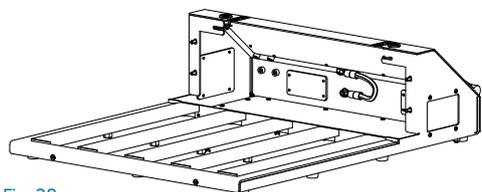


Fig. 28

Part number	637.040.212.000.004
-------------	---------------------

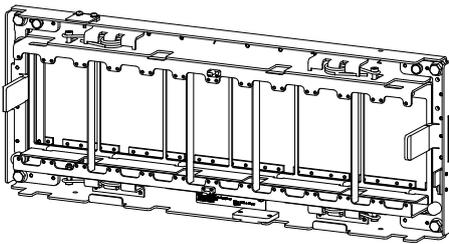
Dimensions	482 x 627 x 173 mm
Weight	8,410 g
Receiver to use	12-Flex TWO M tabletop receiver (manual receiver)
Number of connectors	Max. 12 ODU-MAC® Blue-Line/Black-Line size 2 connectors
Storage temperature	-20...+85 °C
Operating temperature	0...+55 °C
Protection class	IP20 in mated condition
Service life, mating cycles	Mechanism/drive: 20,000 operation cycles (1 cycle = 1x open + 1x close)
Permissible pollution degree	3
Air humidity	0 to 80 % r. h., non-condensing
Maximum weight of adapter (ITA) to use	30 kg

## 5.3 Adapter (ITA) technical data

**NOTICE** If the maximum operating temperature is exceeded, the customer must incorporate additional cooling.

**NOTICE** The rear of the adapter (ITA) must be protected against ingress at the cable outlet in line with IP20 (protection against solid objects >12.5 mm, for use in dry areas).

### 5.3.1 12-Flex FOUR A Adapter



<b>Part number</b>	638.021.412.100.001
--------------------	---------------------

Fig. 29

Dimensions	474 x 184 x 80 mm
Weight	3,570 g
Connectors to use	ODU-MAC® Blue-Line/Black-Line size 4
Number of connectors	Max. 12 ODU-MAC® Blue-Line/Black-Line size 4 connectors
Storage temperature	-20...+85 °C
Operating temperature	0...+55 °C
Protection class	IP20 in mated condition
Service life, mating cycles	Mechanism/drive: 20,000 operation cycles (1 cycle = 1x open + 1x close)
Permissible pollution degree	3
Air humidity	0 to 80 % r. h., non-condensing
Maximum weight of adapter (ITA)	30 kg

### 5.3.2 12-Flex TWO M Adapter

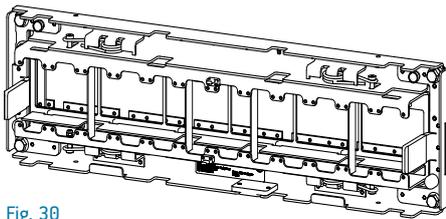


Fig. 30

Variants/Part number	638.022.212.100.001
----------------------	---------------------

Dimensions	474 x 135 x 80 mm
Weight	3,430 g
Connectors to use	ODU-MAC® Blue-Line/Black-Line size 2
Number of connectors	Max. 12 ODU-MAC® Blue-Line/Black-Line size 2 connectors
Storage temperature	-20...+85 °C
Operating temperature	0...+55 °C
Protection class	IP20 in mated condition
Service life, mating cycles	Mechanism/drive: 20,000 operation cycles (1 cycle = 1x open + 1x close)
Permissible pollution degree	3
Air humidity	0 to 80 % r. h., non-condensing
Maximum weight of adapter (ITA)	30 kg

## 5.4 Slide mount technical data

**⚠ WARNING** Risk of the control cabinet tipping or becoming damaged by having a heavy weight attached!

If the control cabinet tips/falls over, this can cause injury, e.g., by crushing personnel.

- ▶ Do not pull out the slide mount assembled in the receiver when the adapter is attached.

### 5.4.1 12-Flex FOUR Receiver slide mount with platform flange

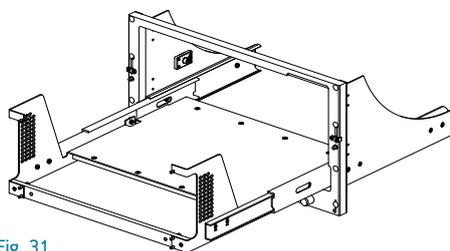


Fig. 31

Part number	637.040.412.000.001
-------------	---------------------

Dimensions (pushed in)	482 x 480 x 265 mm
Weight	8,160 g
Maximum extension length	Approx. 340 mm
Maximum loading capacity	Receiver including equipment
Maximum loading capacity bearing surface	15 kg
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.4.2 12-Flex FOUR Receiver slide mount without platform flange

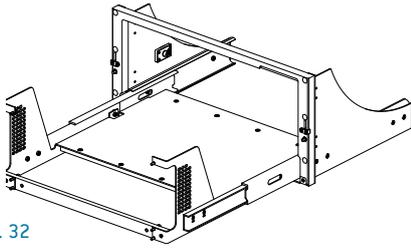


Fig. 32

<b>Part number</b>	637.040.412.000.002
--------------------	---------------------

Dimensions (pushed in)	482 x 480 x 222 mm
Weight	7,230 g
Maximum extension length	Approx. 340 mm
Maximum loading capacity	Receiver including equipment
Maximum loading capacity bearing surface	15 kg
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.4.3 12-Flex TWO M Receiver slide mount with platform flange

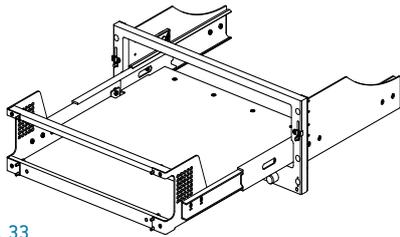
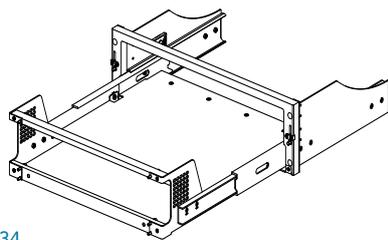


Fig. 33

<b>Part number</b>	637.040.212.000.001
--------------------	---------------------

Dimensions (pushed in)	482 x 482 x 178 mm
Weight	7,870 g
Maximum extension length	Approx. 340 mm
Maximum loading capacity	Receiver including equipment
Maximum loading capacity bearing surface	15 kg
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

#### 5.4.4 12-Flex TWO M Receiver slide mount without platform flange



<b>Part number</b>	<b>637.040.212.000.002</b>
--------------------	----------------------------

Fig. 34

Dimensions (pushed in)	482 x 482 x 133 mm
Weight	6,870 g
Maximum extension length	Approx. 340 mm
Maximum loading capacity	Receiver including equipment
Maximum loading capacity bearing surface	15 kg
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

## 5.5 Accessories technical data

### 5.5.1 200 mm platform extension for slide mount

Part number	637.040.012.000.001
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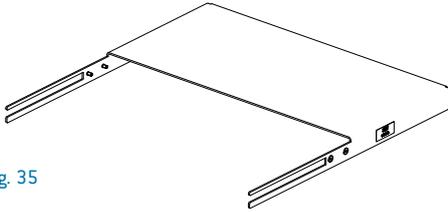


Fig. 35

Dimensions	404 x 400 x 29 mm
Weight	1,620 g
Maximum loading capacity	15 kg
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.5.2 12-Flex TWO/FOUR 15" Platform

Part number	637.040.012.000.002
-------------	---------------------

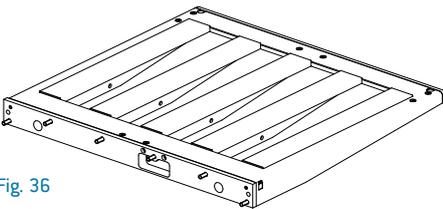


Fig. 36

Dimensions	482 x 448 x 42 mm
Weight	7,500 g
Maximum loading capacity (without adjustable table supports)	30 kg
Maximum loading capacity (with adjustable table supports)	85 kg
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.5.3 12-Flex TWO/FOUR 20" Platform

Part number	637.040.012.000.004
-------------	---------------------

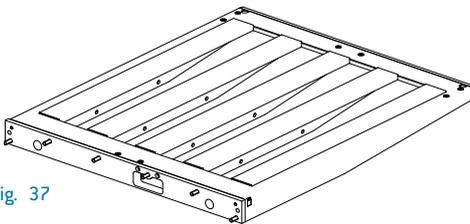


Fig. 37

Dimensions	482 x 575 x 42 mm
Weight	8,100 g
Maximum loading capacity (with adjustable table supports)	85 kg
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.5.4 12-Flex TWO/FOUR adjustable table supports

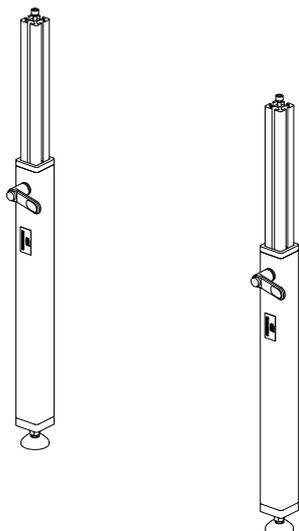


Fig. 38

<b>Part number</b>	637.040.000.000.001
--------------------	---------------------

Dimensions	40 x 44 x 670 – 990 mm
Weight per support	1,550 g
Maximum loading capacity (per support)	42.5 kg (per support)
Storage temperature	–20...+70 °C
Operating temperature	0...+55 °C

### 5.5.5 12-Flex FOUR A Receiver fixed mounting frame with platform flange

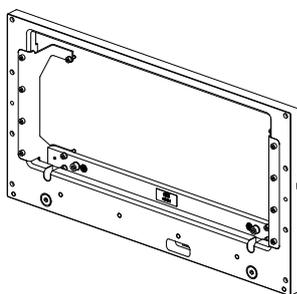


Fig. 39

<b>Part number</b>	637.040.412.000.006
--------------------	---------------------

Dimensions	482 x 265 x 48 mm
Weight	1,980 g
Maximum loading capacity	Receiver including equipment
Storage temperature	–20...+70 °C
Operating temperature	0...+55 °C

### 5.5.6 12-Flex FOUR A Receiver fixed mounting frame without platform flange

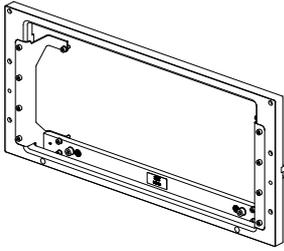


Fig. 40

Part number	637.040.412.000.005
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Dimensions	482 x 222 x 48 mm
Weight	1,820 g
Maximum loading capacity	Receiver including equipment
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.5.7 12-Flex TWO M Receiver fixed mounting frame with platform flange

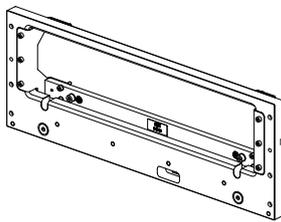


Fig. 41

Part number	637.040.212.000.006
-------------	---------------------

Dimensions	482 x 177.5 x 48 mm
Weight	1,930 g
Maximum loading capacity	Receiver including equipment
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.5.8 12-Flex TWO M Receiver fixed mounting frame without platform flange

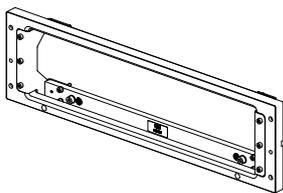


Fig. 42

Part number	637.040.212.000.005
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Dimensions	482 x 133 x 48 mm
Weight	1,770 g
Maximum loading capacity	Receiver including equipment
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.5.9 Hand lever extension receiver

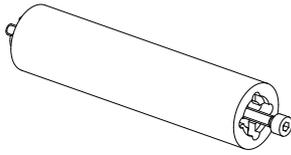


Fig. 43

Part number	637.052.000.000.001
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Dimensions	Ø24 x 100 mm
Weight	340 g
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.5.10 Hand lever extension receiver

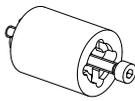


Fig. 44

Part number	637.052.000.000.002
-------------	---------------------

Dimensions	Ø24 x 30 mm
Weight	100 g
Storage temperature	-20...+70 °C
Operating temperature	0...+55 °C

### 5.5.11 12-Flex FOUR Enclosure 9"

**NOTICE**

The flange plates on the enclosure must be protected against intrusion in accordance with IP20 (Protection against solid objects >12.5 mm, for use in dry areas).

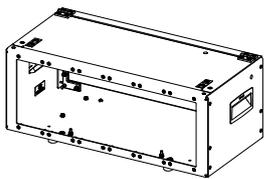


Fig. 45

Part number	638.040.412.000.002	638.040.412.000.003
for FOUR A Adapter (ITA)	●	—
for TWO M Adapter (ITA)	—	●

Dimension	223 x 474 x 184 mm
Weight	2,500 g
Compatible adapter	12-Flex TWO M Adapter / 12-Flex FOUR A Adapter
Number of flange plates	max. 6 flange plates
Storage temperature	-20...+85 °C
Operating temperature	0 ... +55 °C
Protection class	IP20 in mated condition
Permissible pollution degree	3
Air humidity	0 to 80 % r. h., non-condensing
Maximum weight	30 kg

### 5.5.12 12-Flex FOUR Enclosure 15"

**NOTICE**

The flange plates on the enclosure must be protected against intrusion in accordance with IP20 (Protection against solid objects >12.5 mm, for use in dry areas).

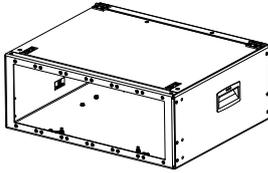


Fig. 46

Part number	638.040.412.000.001	638.040.412.000.004
for FOUR A Adapter (ITA)	●	—
for TWO M Adapter (ITA)	—	●

Dimension	381 x 474 x 184 mm
Weight	3,500 g
Compatible adapter	12-Flex TWO M Adapter / 12-Flex FOUR A Adapter
Number of flange plates	max. 6 flange plates
Storage temperature	-20...+85 °C
Operating temperature	0 ... +55 °C
Protection class	IP20 in mated condition
Permissible pollution degree	3
Air humidity	0 to 80 % r. h., non-condensing
Maximum weight	30 kg

### 5.5.13 12-Flex FOUR Enclosure adapter plate for TWO M Adapter

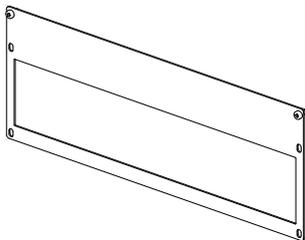


Fig. 47

Part number	638.040.212.000.017
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Dimensions	464 x 176 x 2 mm
Weight	450 g

### 5.5.14 12-Flex FOUR Enclosure flange plate

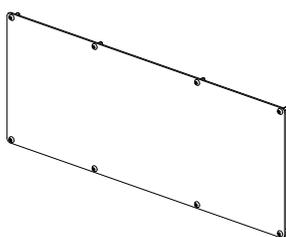


Fig. 48

Part number	638.208.902.000.026
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Dimensions	425 x 170 x 2 mm
Weight	390 g

### 5.5.15 FOUR Enclosure flange plate, double (without cut-out)



Fig. 49

Part number	638.040.212.000.016
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Dimensions	142 x 170 x 2 mm
Weight	130 g

### 5.5.16 FOUR Enclosure flange plate (without cut-out)



Fig. 50

Part number	638.040.212.000.012
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Dimensions	71 x 170 x 2 mm
Weight	65 g

### 5.5.17 FOUR Enclosure flange plate for bulkhead housings

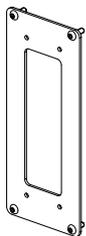


Fig. 51

Part number	638.040.212.000.006
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Dimensions	71 x 170 x 2 mm
Weight	45 g

### 5.5.18 FOUR Enclosure flange plate for ODU-MAC® Rapid

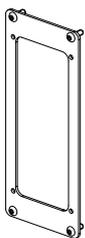


Fig. 52

Part number	638.040.212.000.008
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Dimensions	71 x 170 x 2 mm
Weight	45 g

### 5.5.19 FOUR Enclosure flange plate for cable feedthroughs

<b>Part number</b>	638.040.212.000.010
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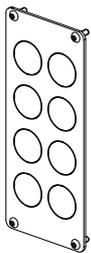


Fig. 53

Dimensions	71 x 170 x 2 mm
Weight	65 g

### 5.5.20 FOUR Enclosure flange plate 8x D-SUB 15-pin

<b>Part number</b>	638.040.212.000.014
--------------------	---------------------

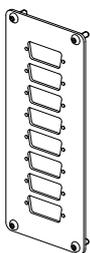


Fig. 54

Dimensions	71 x 170 x 2 mm
Weight	50 g

## 5.6 Covers

### 5.6.1 12-Flex FOUR Receiver protective cover

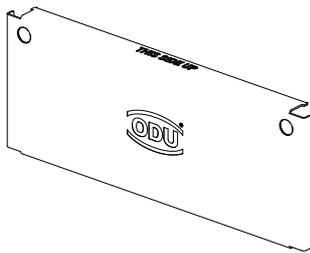


Fig. 55

Part number	637.060.412.000.001
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Dimensions	478 x 189 x 32 mm
Weight	1,810 g

### 5.6.2 12-Flex TWO Receiver protective cover

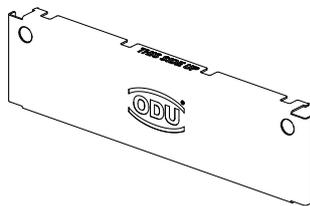


Fig. 56

Part number	637.060.212.000.001
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Dimensions	478 x 126 x 32 mm
Weight	1,310 g

### 5.6.3 12-Flex FOUR Adapter protective cover

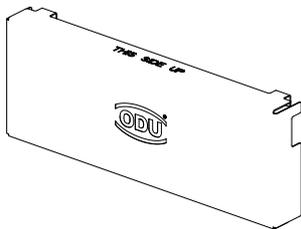


Fig. 57

Part number	638.060.412.000.002
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Dimensions	474 x 181 x 53 mm
Weight	690 g

### 5.6.4 12-Flex TWO Adapter protective cover

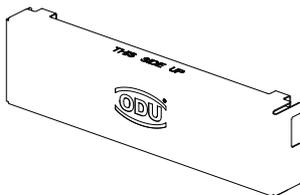


Fig. 58

Part number	638.060.212.000.002
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Dimensions	474 x 132 x 53 mm
Weight	540 g

### 5.6.5 Cover for 12-Flex FOUR A Receiver slot

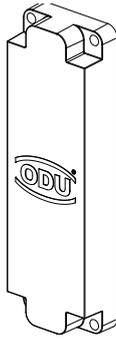


Fig. 59

Part number	637.154.000.921.001
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Dimensions	27 x 104 x 16 mm
Weight	20 g

### 5.6.6 Cover for 12-Flex TWO M Receiver slot

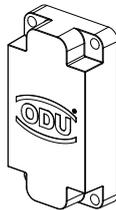


Fig. 60

Part number	637.152.000.921.001
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Dimensions	27 x 57 x 16 mm
Weight	15 g

### 5.6.7 Cover for 12-Flex FOUR A Adapter slot

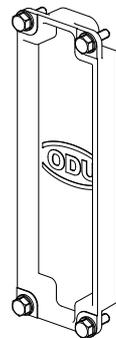


Fig. 61

Part number	638.154.000.921.001
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Dimensions	27 x 104 x 10.7 mm
Weight	20 g

### 5.6.8 Cover for 12-Flex TWO M Adapter slot

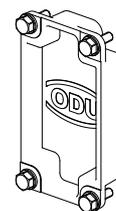


Fig. 62

Part number	638.152.000.921.001
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Dimensions	27 x 57 x 10.7 mm
Weight	15 g

## 5.7 Strain-relief plates

### 5.7.1 Flex FOUR Receiver strain-relief plate

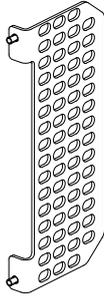


Fig. 63

Part number	637.050.400.000.002
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Dimensions	128 x 54 x 10 mm
Weight	56 g

### 5.7.2 Flex TWO Receiver strain-relief plate

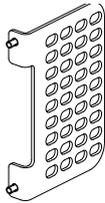


Fig. 64

Part number	637.050.200.000.001
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Dimensions	81 x 54 x 10 mm
Weight	39 g

### 5.7.3 Flex FOUR Adapter strain-relief plate

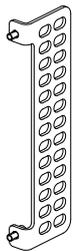


Fig. 65

Part number	638.050.400.000.003
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Dimensions	105 x 48 x 10 mm
Weight	50 g

### 5.7.4 Flex TWO Adapter strain-relief plate

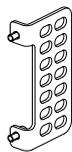


Fig. 66

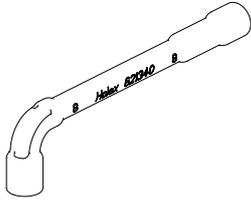
Part number	638.050.200.000.004
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Dimensions	78 x 53 x 10 mm
Weight	45 g

## 5.8 Special tools

### 5.8.1 Width across flats 8 socket wrench for receiver emergency release

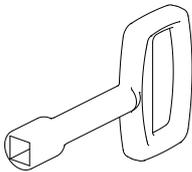
Fig. 67



Part number	098.637.000.000.001
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### 5.8.2 Socket wrench for service access lock

Fig. 68



Part number	098.637.000.000.002
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# 6. ASSEMBLY

Read the safety information below before carrying out any assembly work and take note of the measures described therein designed to ensure safe assembly.

## 6.1 Safety information relating to assembly

### **WARNING** Danger from improper assembly!

**Improper assembly can lead to accidents and cause injury.**

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Only assemble permissible combinations of devices.
- ▶ Take note of the assembly information contained in these instructions.
- ▶ Comply with the maximum load limits.
- ▶ Only use mounting materials according to the specifications in these instructions.
- ▶ Only use genuine spare parts.

### **WARNING** Risk of tipping from control cabinet having an incorrect center of gravity!

**If the control cabinet tips/falls over, this can cause injury, e.g., by crushing personnel.**

- ▶ When assembling the receiver in the control cabinet, make sure the control cabinet's center of gravity is stable.
- ▶ Take the additional weight of installed equipment such as the adapter (ITA), platform, slide mount, and attached cables into account.

### **CAUTION** Risk of injury from sharp edges and corners!

**Sharp edges and corners can cause abrasions and cuts.**

- ▶ Be careful when working near to sharp edges and corners.
- ▶ Wear personal protective equipment.

### **CAUTION** Risk of crushing from tightening mechanism! Hands may become crushed between the receiver and adapter (ITA).

- ▶ Make sure the travel path of the tightening mechanism is unobstructed before operating it.

### **CAUTION** Weight of the adapter may be too heavy for the operator when using the device without a platform.

- ▶ Observe occupational health and safety regulations.
- ▶ Use additional aids.

### **CAUTION** If no ODU platform is used, it is essential to provide a separate support for the adapters as described in [section 6.7](#).

**i NOTICE**

Only assemble the combinations listed below.

## 6.2 Combination options

Designation/ Part number	12-Flex FOUR A Receiver	12-Flex TWO M Receiver	12-Flex TWO M Tabletop receiver	200 mm platform extension for slide mount	15" platform 637.040.012.000.002	12 Flex FOUR enclosure 9" & 15"	12 Flex FOUR enclosure 9" & 15"
	637.011.412.000.001 637.011.412.001.001 637.011.412.003.001 637.011.412.002.001	637.012.212.000.001 637.012.212.001.001 637.012.212.003.001 637.012.212.002.001	637.032.212.000.001 637.032.212.001.001 637.032.212.003.001 637.032.212.002.001	637.040.012.000.001	20" platform 637.040.012.000.004	638.040.412.000.002 638.040.412.000.001	638.040.412.000.003 638.040.412.000.004

### Desktop housing

12-Flex TWO M Tabletop- cover and platform 637.040.212.000.004	-	-	● see <a href="#">Section 6.10</a>	-	-	-	-
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### Adapter (ITA)

12-Flex FOUR A Adapter 638.021.412.100.001	● see <a href="#">Section 8.4</a>	-	-	-	-	-	-
12-Flex TWO M Adapter 638.022.212.100.001	-	● see <a href="#">Section 8.5</a>	● see <a href="#">Section 8.5</a>	-	-	-	-

### Slide mounts

12-Flex FOUR A Receiver slide mount with platform flange 637.040.412.000.001	● see <a href="#">Section 6.9</a>	-	-	● see <a href="#">Section 6.12</a>	● see <a href="#">Section 6.12</a>	-	-
12-Flex FOUR A Receiver slide mount without platform flange 637.040.412.000.002	● see <a href="#">Section 6.9</a>	-	-	● see <a href="#">Section 6.12</a>	-	-	-
12-Flex TWO M Receiver slide mount with platform flange 637.040.212.000.001	-	● see <a href="#">Section 6.9</a>	-	● see <a href="#">Section 6.12</a>	● see <a href="#">Section 6.6</a>	-	-
12-Flex TWO M Re- ceiver slide mount without platform flange 637.040.212.000.002	-	● see <a href="#">Section 6.9</a>	-	● see <a href="#">Section 6.12</a>	-	-	-

### Table supports

Adjustable table supports 637.040.000.000.001	-	-	-	-	● see <a href="#">Section 6.7</a>	-	-
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Designation/ Part number	12-Flex FOUR A Receiver	12-Flex TWO M Receiver	12-Flex TWO M Tabletop receiver	200 mm platform extension for slide mount	15" platform 637.040.012.000.002  20" platform 637.040.012.000.004
	637.011.412.000.001 637.011.412.001.001 637.011.412.003.001 637.011.412.002.001	637.012.212.000.001 637.012.212.001.001 637.012.212.003.001 637.012.212.002.001	637.032.212.000.001 637.032.212.001.001 637.032.212.003.001 637.032.212.002.001	637.040.012.000.001	

#### Fixed mounting frames

12-Flex FOUR A Receiver fixed mounting frame with platform flange 637.040.412.000.006	● see <a href="#">Section 6.9</a>	–	–	–	● see <a href="#">Section 6.6</a>
12-Flex FOUR A Receiver fixed mounting frame without platform flange 637.040.412.000.005	● see <a href="#">Section 6.9</a>	–	–	–	–
12-Flex TWO M Receiver fixed mounting frame with platform flange 637.040.212.000.006	–	● see <a href="#">Section 6.9</a>	–	–	● see <a href="#">Section 6.6</a>
12-Flex TWO M Receiver fixed mounting frame without platform flange 637.040.212.000.005	–	● see <a href="#">Section 6.9</a>	–	–	–

## 6.3 Installation of connectors and slot covers

### 6.3.1 Installation of connectors and slot covers into the receiver

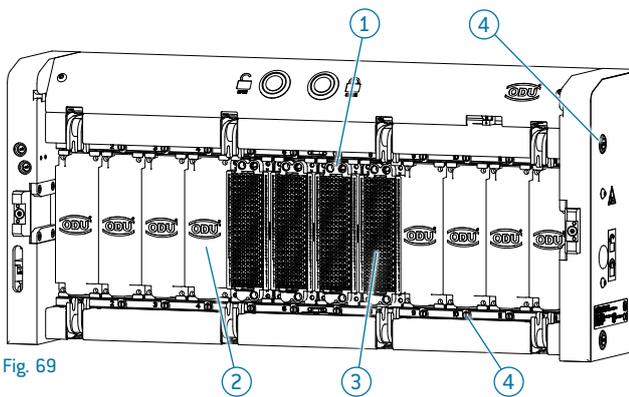


Fig. 69

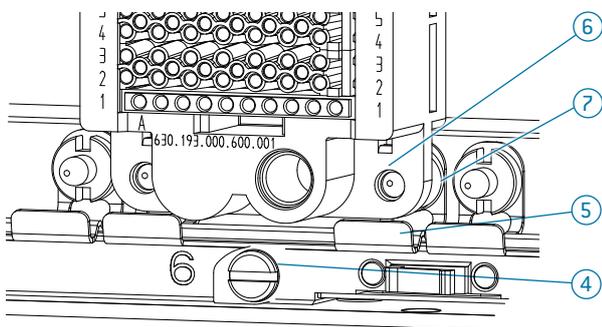


Fig. 70

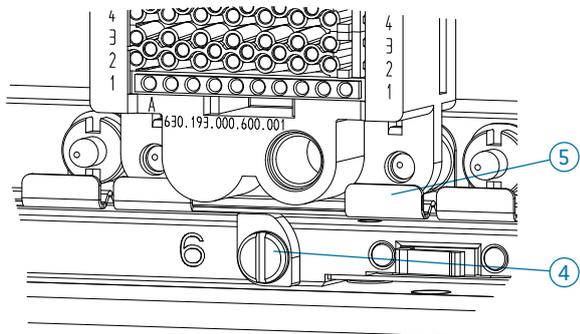


Fig. 71

- There are 12 slots available in the receiver.
- ODU-MAC® Blue-Line / Black-Line connectors (3) or ODU-MAC® slot covers (2) can be installed in these slots.
- The connectors (3) or slot covers (2) are fixed into the receiver with two eccentric screws (4) each.
- Connectors and slot covers are assembled in the same way as one another. The example shows the assembly of a connector.

#### Installation in the receiver

- ▶ To insert a connector, undo the top and bottom eccentric screws (4) at the relevant slot. Do this by turning the eccentric screw counterclockwise by 90° (Fig. 70).
- ▶ Make sure the edge with the two guide bushings (1) is at the top.
- ▶ Insert the connector (3) into the slot. Do this by fitting the holes in the frame (6) onto the centering pins (7).
- ▶ Turn the top and bottom eccentric screws clockwise by 90° to close them. The spring plate of the bracket (5) moves into the locking position when the eccentric screw (4) is turned. This fixes the connector into position at (4) and (5) (Fig. 71).
- ▶ Please use an appropriate cable length for the cable harness of the connectors (3). To remove the connectors (3) it is necessary to pull these to the front, turn it slightly and push the connector through the receiver.

#### ATTENTION

#### Risk of injury from empty slots!

- ▶ Always close off empty slots with slot covers. For details of covers for slots in the receiver, see [Section 5.6](#). Make sure all connectors and slot covers have been inserted and locked correctly.

- ① Two guide bushings
- ② Installed slot cover
- ③ Installed connector
- ④ Eccentric screws
- ⑤ Spring plate
- ⑥ Hole in frame
- ⑦ Centering pin

### 6.3.2 Installation of connectors and slot covers into the adapter (ITA)

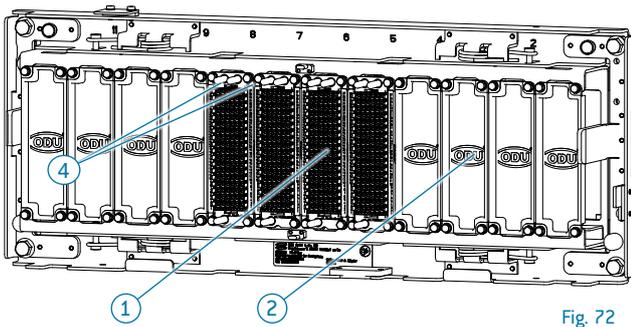


Fig. 72

- There are 12 slots available in the adapter (ITA).
- ODU-MAC® Blue-Line/Black-Line connectors ① or ODU-MAC® slot covers ② can be installed in these slots.
- The connectors or slot covers are screwed into the adapter (ITA) with four screws ③ each. The screws are included in the scope of delivery.
- Connectors and slot covers are assembled in the same way as one another. The example shows the assembly of a connector.

#### Installation in the adapter (ITA)

- ▶ Make sure the guiding pins ④ ⑤ on the connector are facing the mating direction.
- ▶ Position the edge with the two guiding pins ④ at the top. Take note of the slot label at the top.
- ▶ Align the holes in the connector ⑦ with the threaded holes in the adapter (ITA) ⑥.
- ▶ Use the four screws ③ to secure the connector. Take note of the specified tightening torque.
- ▶ After assembly, the connector ① must be mounted in a floating position (Fig. 73).
- ▶ Please use an appropriate cable length for the cable harness of the connectors ③. To remove the connectors ③ it is necessary to pull these to the front, turn it slightly and push the connector through the receiver.

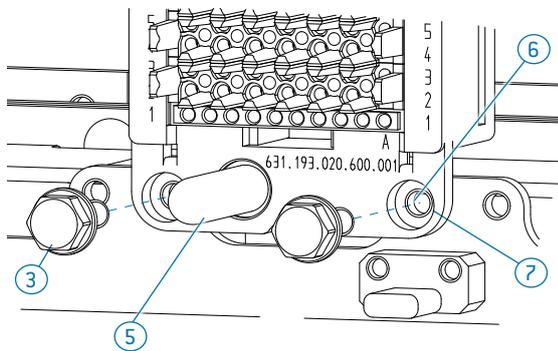


Fig. 73

#### NOTICE

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

#### ATTENTION

**Risk of injury from empty slots!**

- ▶ Always close off empty slots with slot covers. For details of covers for slots in the adapter (ITA), see [Section 5.6](#).

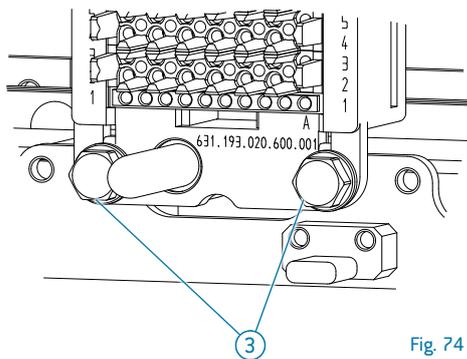


Fig. 74

- ① Installed connector
- ② Installed slot cover
- ③ Screws (4x)
- ④ Top two guiding pins
- ⑤ Bottom guiding pin
- ⑥ Threaded holes in adapter (ITA) (4x)
- ⑦ Holes in connector (4x)

## 6.4 Assembly of fixed mounting frame into the control cabinet

- The fixed mounting frame (2) is screwed into the control cabinet using the hole pattern in the control cabinet's 19" mounting strips (3).  
The customer should select their own screws (1).
- All fixed mounting frames are assembled in the same way as one another.
- The example shows the assembly of the 12-Flex FOUR receiver fixed mounting frame with platform flange.

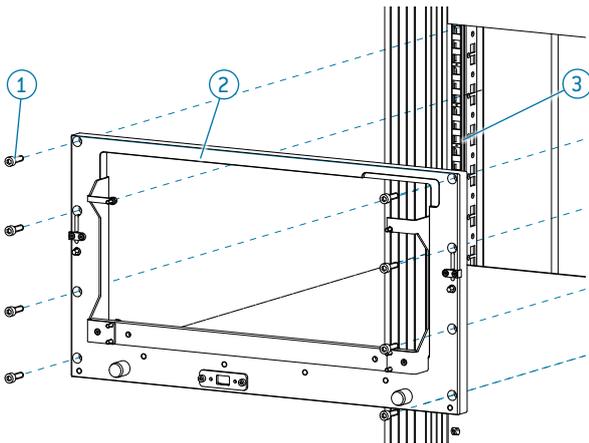


Fig. 75

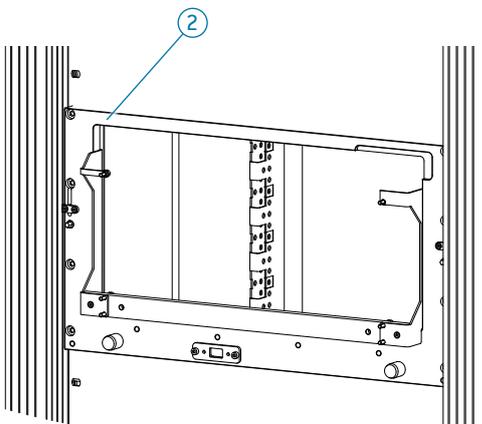


Fig. 76

### Assembling the fixed mounting frame into the control cabinet

- ▶ Fit the fixed mounting frame (2) onto the control cabinet's mounting strips (3) from the outside.
- ▶ Use screws to secure the fixed mounting frame to the control cabinet's mounting strips (3).

#### **NOTICE**

Take note of the details pertaining to size and number of screws!

The screws required to assemble the fixed mounting frame on the control cabinet are not included in the scope of delivery.

For details of the size and number of screws to use for each fixed mounting frame, see [Section 6.16](#).

- ① Screws
- ② Fixed mounting frame
- ③ Mounting strip

#### **NOTICE**

Make sure that the required areas for emergency unlocking are easily accessible, otherwise it will not be possible to open the receiver in the event of a defect in the electromechanical locking system. For additional information please refer to [Section 10.2](#).

## 6.5 Assembly of slide mount into the control cabinet

- The fixed mounting frame (2) is already permanently attached to the slide mounts.
- The slide mount is screwed into the control cabinet using the hole pattern in the control cabinet's 19" mounting strips (3). The customer should select their own screws (1).
- The example shows the assembly of a 12-Flex FOUR receiver slide mount with platform flange.

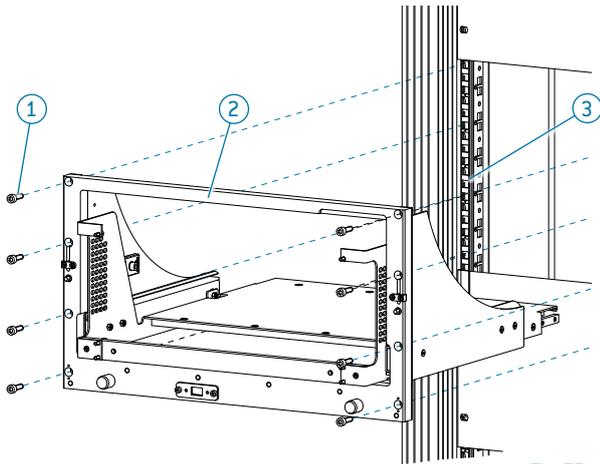


Fig. 77

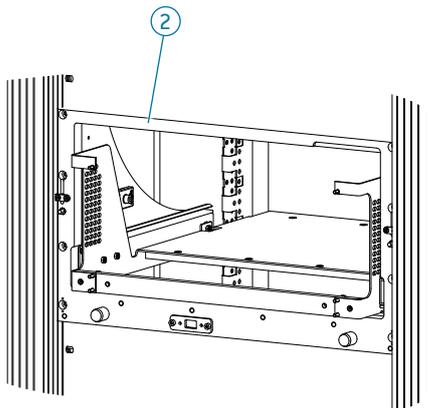


Fig. 78

### Assembling the slide mount into the control cabinet

- ▶ Fit the fixed mounting frame of the slide mount (2) onto the control cabinet's mounting strips (3) from the outside.
- ▶ Use screws to secure the fixed mounting frame to the control cabinet's mounting strips (3).

#### **NOTICE**

Take note of the details pertaining to size and number of screws!

The screws required to assemble the fixed mounting frame on the control cabinet are not included in the scope of delivery.

For details of the size and number of screws to use for each fixed mounting frame, see [Section 6.16](#).

- ① Screws
- ② Fixed mounting frame on the slide mount
- ③ Mounting strip

#### **NOTICE**

Make sure that the required areas for emergency unlocking are easily accessible, otherwise it will not be possible to open the receiver in the event of a defect in the electromechanical locking system. For additional information please refer to [Section 10.2](#).

## 6.6 Assembly of 12-Flex TWO/FOUR 15" / 20" Platform onto the platform flange

- The 15" platform (1) is screwed onto the platform flange (2) using six screws (included in the scope of delivery).
- The example shows the assembly of the 15" platform onto the 12-Flex FOUR receiver slide mount with platform flange.
- All items with a platform flange are assembled in exactly the same way.

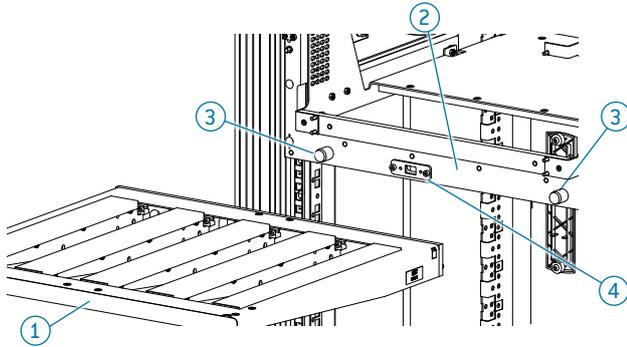


Fig. 79

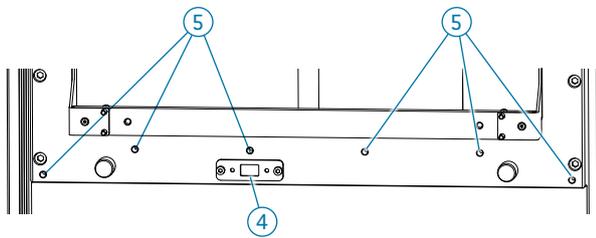


Fig. 80

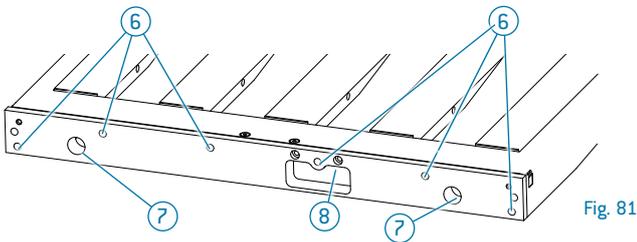


Fig. 81

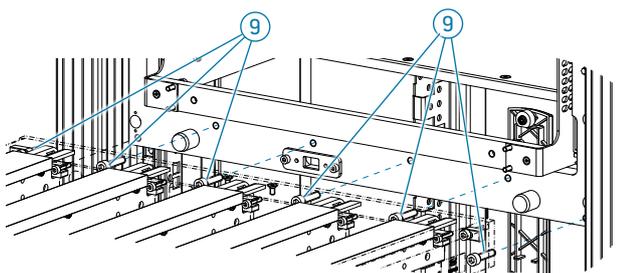


Fig. 82

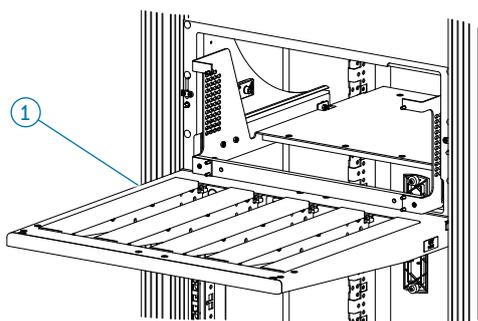


Fig. 83

### Assembling the 15" platform onto the platform flange

- ▶ Align the cylindrical slots in the 15" platform (7) with the cylindrical pins on the platform flange (3).
- ▶ Push the 15" platform (1) on as far as the platform flange (2). The 15" platform is aligned by the cylindrical pins (3) on the platform flange.
- ▶ Screw the 15" platform onto the platform flange at the designated fixing points (6). Take note of the specified tightening torque.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

- (1) 15" platform
- (2) Platform flange
- (3) Cylindrical pins on platform flange
- (4) Cable feedthrough for keyboard
- (5) Fixing points on platform flange
- (6) Fixing points on 15" platform
- (7) Cylindrical slots in 15" platform
- (8) Cable feedthrough
- (9) Screws [6x]

## 6.7 Assembly of 12-Flex TWO/FOUR adjustable table supports

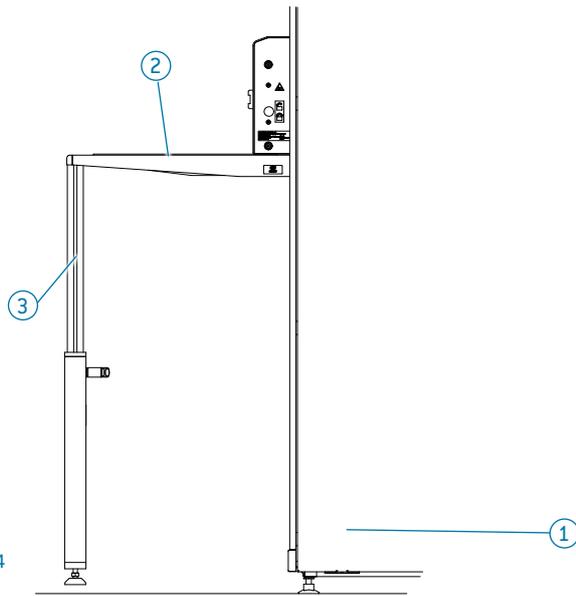


Fig. 84

- The table supports (3) are mounted on both sides of the table (2) to take the load off the table and to reduce the risk of the test cabinet (1) tipping over.
- The table supports are mounted on both tables using the same assembly principle.
- This assembly example shows the assembly of the 12-Flex TWO/FOUR adjustable table supports on the 12-Flex TWO / FOUR 15 on the 12-Flex TWO / FOUR 15" platform.

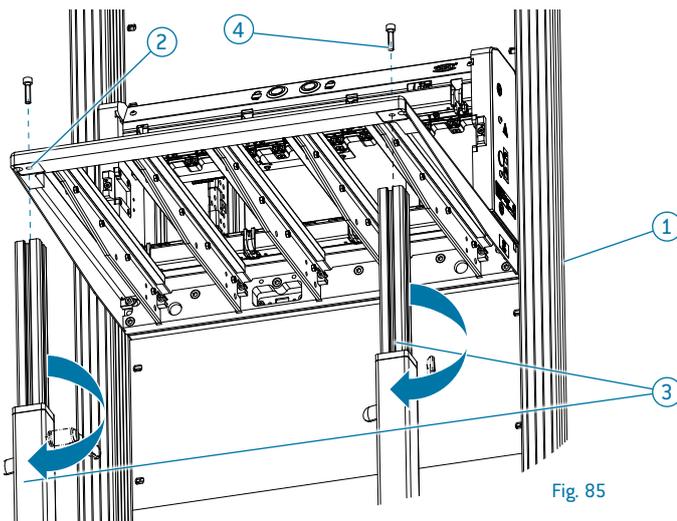


Fig. 85

### Assembling the adjustable table supports

- ▶ Align the table supports (3) to the bottom side of the table to the square recesses of the table (2).
- ▶ You can rotate the table supports (3) by 90° so that the handles (6) are in the desired position.
- ▶ Attach the table supports (3) to the platform (2) using the supplied screws (4).

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

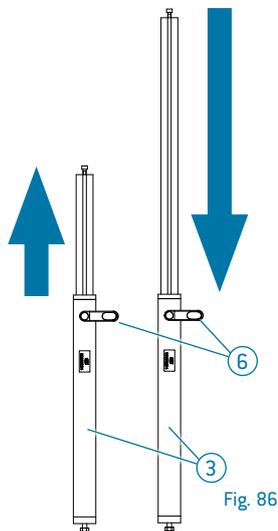


Fig. 86

- The adjustable table supports (3) can be set to any height from min. 675 mm to max. 990 mm.
- When the correct height is reached, the support (3) can be fixed in place by turning the handle (6) clockwise.

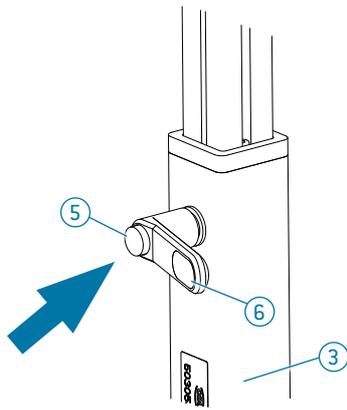


Fig. 87

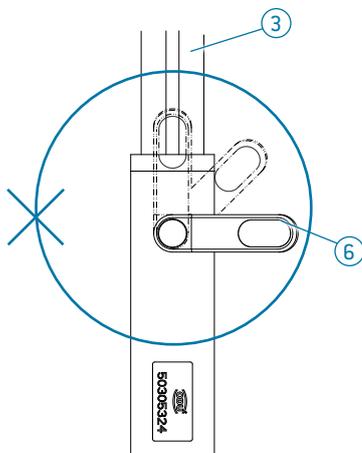


Fig. 88

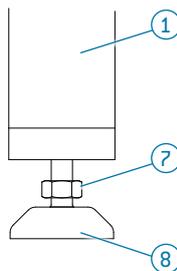


Fig. 89

- Press the push button (5) on the handle (6) of the adjustable table support (3) to be able to turn the handle in the desired direction when it is already clamped in place.
- The adjustable table base (8) on the bottom side of the adjustable table supports (3) can be adjusted by turning. When the correct position is reached, the foot must be fixed with the lock nut (?).

**NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see Section 6.16 .

**NOTICE**

If the maximum load capacity of the platform is exceeded and our adjustable table supports are not used, sufficient support for the table must be provided independently.

- ① Test cabinet
- ② Platform
- ③ Adjustable table supports
- ④ Fixing screws
- ⑤ Push button on the handle
- ⑥ Handle
- ⑦ Lock nut
- ⑧ Adjustable table base

## 6.8 Assembly instructions for customer's own table for 12-Flex TWO/FOUR systems

### ATTENTION

Risk of damage to the system due to missing platform / support for adapters (ITA). To prevent such damage an ODU platform, a customer platform or other solutions are needed.

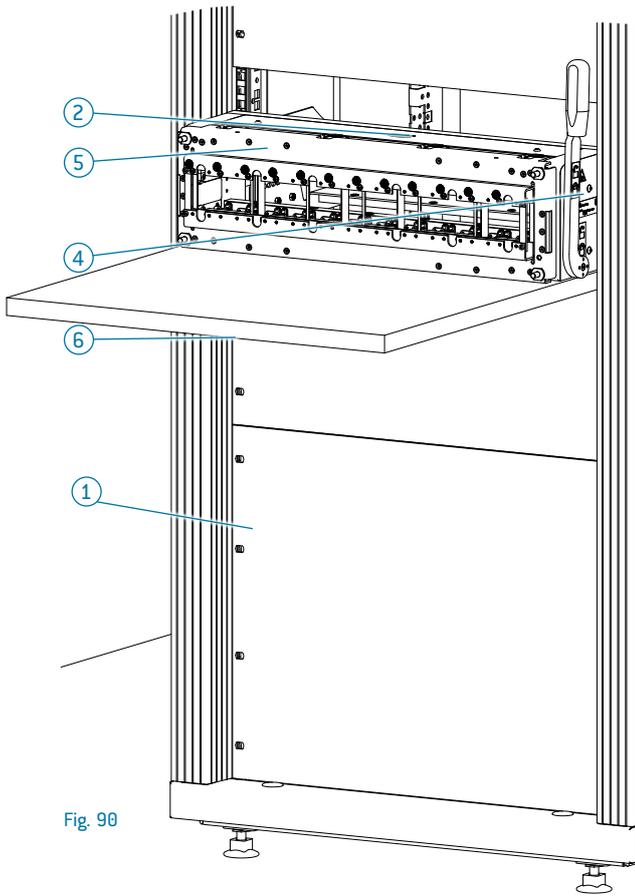


Fig. 90

### Installing customer-specific solutions

- ▶ For the installation of a customer support option ⑥ with a 12-Flex TWO mounting plate without platform flange ②, the specified dimension between the centring pin and the support surface ⑥ of the adapter must be observed.
- ▶ See Fig. 91
- ▶ For the installation of a customer-specific support option ⑥ with a 12-Flex FOUR mounting plate without platform flange ③, the specified dimension between the centring pin and the support surface ⑥ of the adapter must be observed.
- ▶ See Fig. 92

### NOTICE

The specified dimensions for the customer solutions must be observed.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

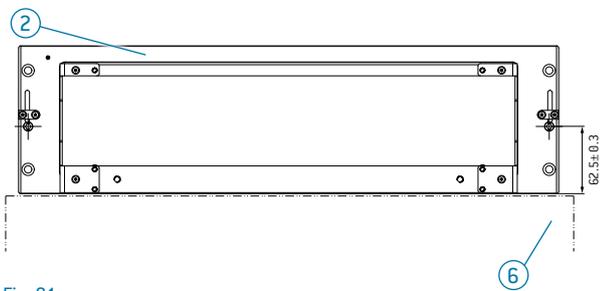


Fig. 91

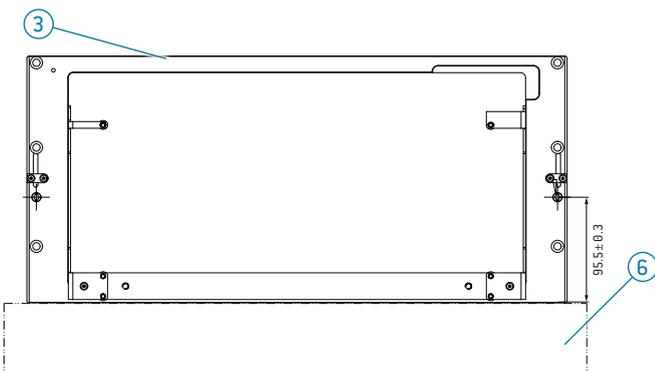


Fig. 92

- ① Test cabinet
- ② 12-Flex TWO mounting plate without platform flange
- ③ 12-Flex FOUR mounting plate without platform flange
- ④ Receiver
- ⑤ Adapter (ITA)
- ⑥ Customer platform solution or support

## 6.9 Assembly of unequipped receiver onto the slide mount

### ATTENTION

**Risk of damage from excessive weight!**

- ▶ Do not pull out the slide mount assembled in the receiver when the adapter (ITA) is attached.

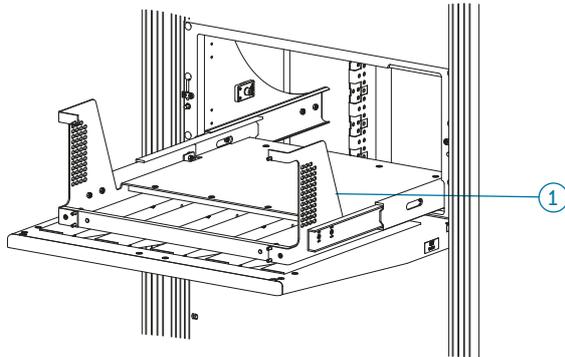


Fig. 93

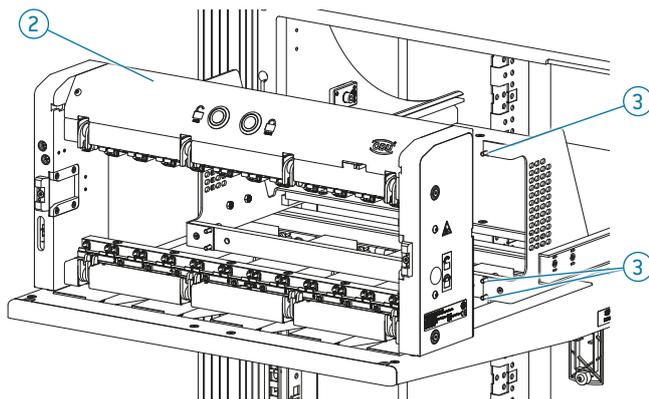


Fig. 94

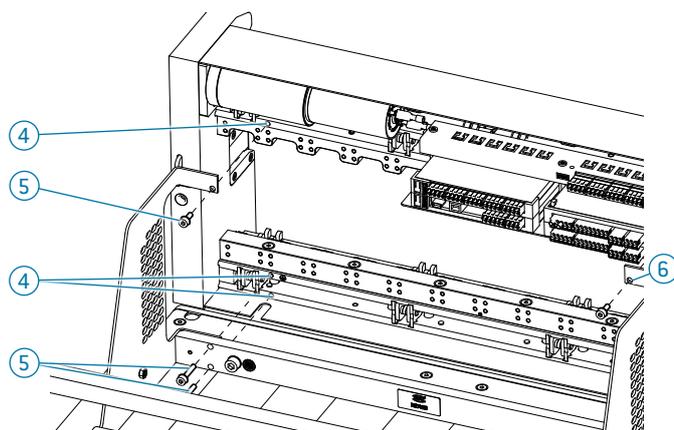


Fig. 95

- The receiver ② is secured to the slide mount ① using screws (included in the scope of delivery).
- All slide mounts are assembled in the same way as one another.  
The example shows the assembly of a 12-Flex FOUR A receiver onto the 12-Flex FOUR Receiver slide mount with platform flange.

### Assembling the receiver onto the slide mount

- ▶ Pull out the slide mount ①.
- ▶ Guide the top left bracket ⑥ of the slide mount behind the controller (Fig. 95).
- ▶ Position the receiver ② so its fixing points ④ align with the fixing points on the slide mount ③. Screw the slide mount onto the receiver fixing points.
- ▶ Lock the receiver to the slide mount, see [Section 8.3](#).

### NOTICE

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

- ① Slide mount pulled out
- ② Receiver
- ③ Fixing points on the slide mount (6x)
- ④ Fixing points on the receiver (6x)
- ⑤ Screws
- ⑥ Top left bracket

## 6.10 Assembly of tabletop receiver onto the tabletop housing

- The tabletop receiver (2) is secured to the tabletop housing (1) using screws and washers (6) (included in the scope of delivery).

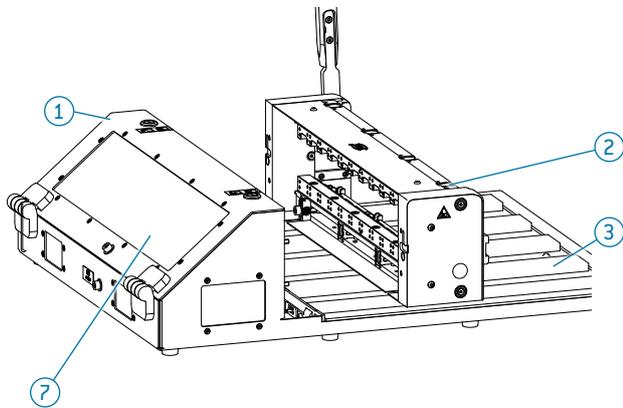


Fig. 96

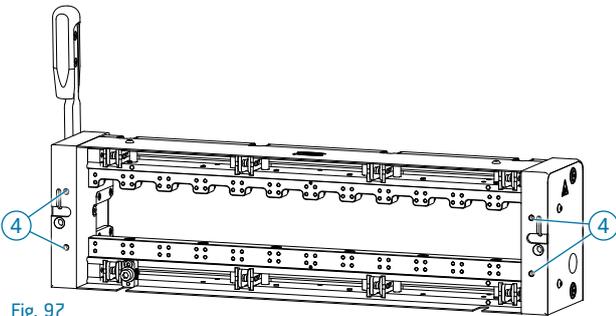


Fig. 97

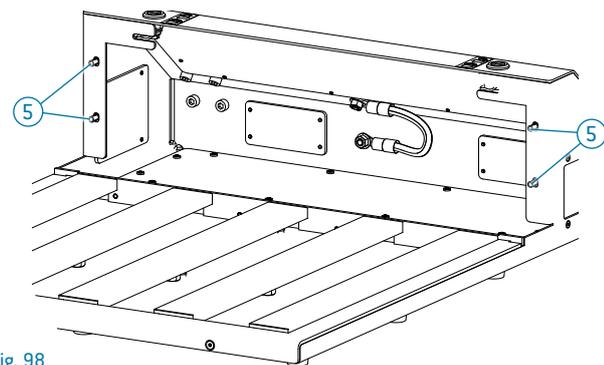


Fig. 98

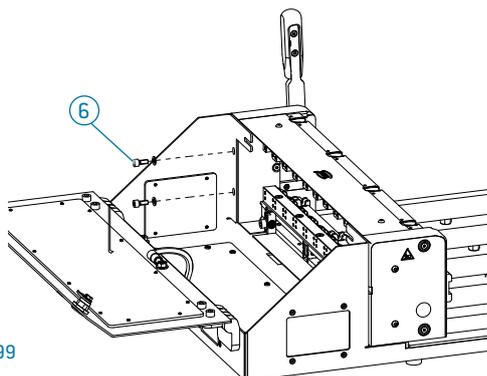


Fig. 99

### Assembling the tabletop receiver onto the tabletop housing

- ▶ Place the tabletop receiver (2) on the platform of the tabletop housing (3).
- ▶ Position the tabletop receiver so its fixing points (4) align with the fixing points of the tabletop housing (5).
- ▶ Open the service flap (7).
- ▶ Assemble the tabletop receiver (2) onto the tabletop housing (1). Do this by screwing the tabletop receiver onto the tabletop housing fixing points (5).
- ▶ Close the service flap (7).

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

- ① Tabletop housing
- ② Tabletop receiver
- ③ Tabletop platform
- ④ Fixing points on the tabletop housing
- ⑤ Fixing points on the tabletop receiver
- ⑥ Screws with washers (4x)
- ⑦ Service flap

## 6.11 Repositioning of hand lever on manual receivers

- The position of the hand lever (4) can be changed if necessary on manual receivers.

### Repositioning the hand lever

- ▶ Remove the screw (2) from the hand lever (1).
- ▶ Take the hand lever (1) off the mount (3).
- ▶ Turn the hand lever (1) into the required position.
- ▶ Reattach the turned hand lever (1) onto the mount (3).
- ▶ Secure the hand lever with the screw (2).

### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

- ① Hand lever
- ② Screw
- ③ Mount
- ④ Positions of the hand lever, each turned by 90°

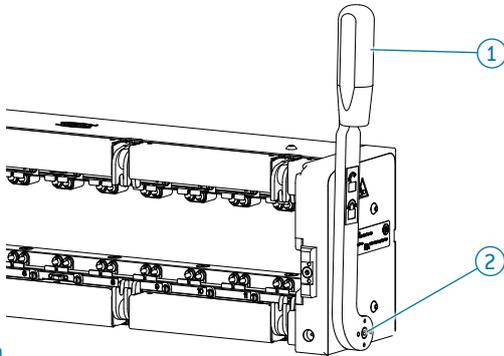


Fig. 100

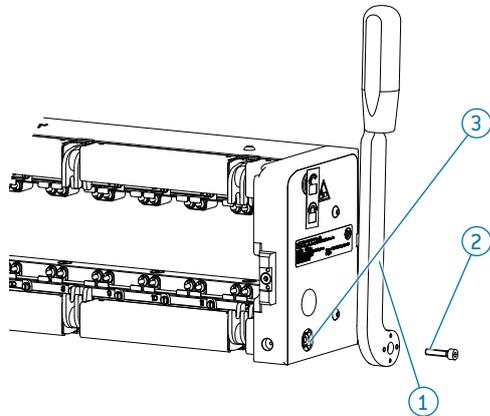


Fig. 101

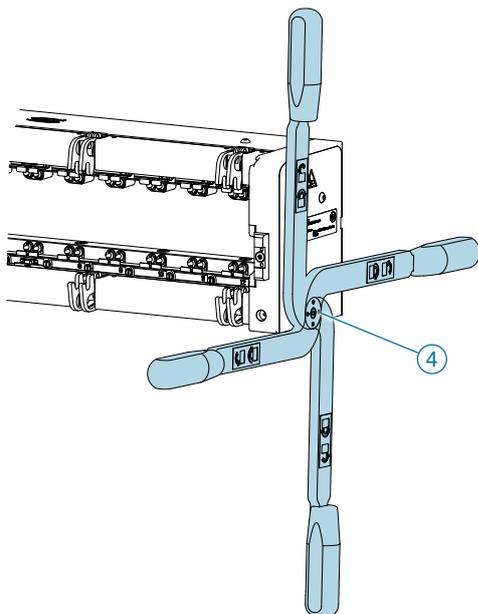


Fig. 102

### 6.11.1 Installing the hand lever extension

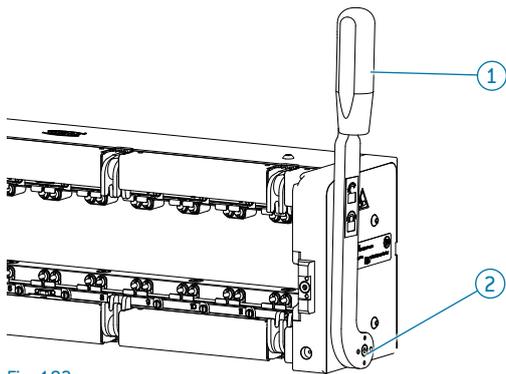


Fig. 103

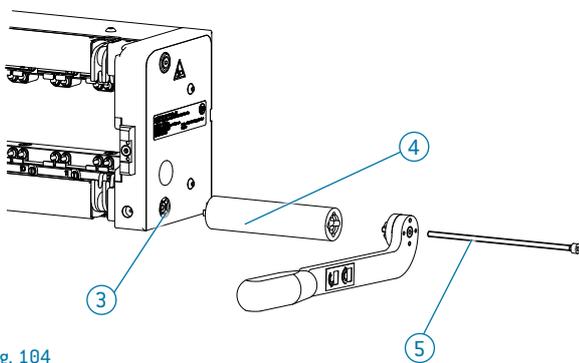


Fig. 104

- A hand lever extension can be used with manually operated receivers if required (4).

#### Installing the hand lever extension

- ▶ Remove the screw M4 x 18 (2) from the hand lever (1).
- ▶ Take the hand lever (1) off the mount (3).
- ▶ Insert the hand lever (1) with the additional hand lever extension (4) into the mount (3).
- ▶ Secure the hand lever (1) with the screw M4 x 120 or M4 x 50 (5) depending on the variant of the hand lever extension.

#### **i NOTICE**

Observe the specified tightening torques and number of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

- ① Hand lever
- ② M4 x 18 screw
- ③ Mount
- ④ Hand lever extension
- ⑤ M4 x 120 or M4x50 screw

## 6.12 Assembly of 200 mm platform extension onto the slide mount

- The platform extension (4) is assembled onto all slide mounts in the same way. The example shows the assembly of the 200 mm platform extension onto the 12-Flex FOUR receiver slide mount with platform flange.

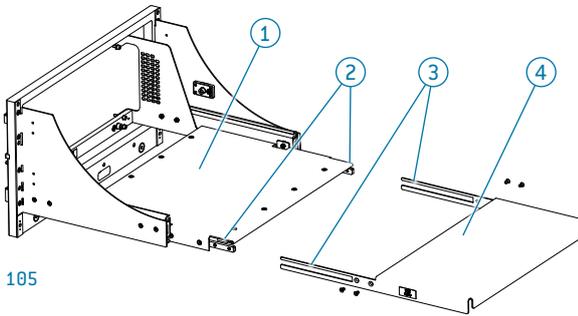


Fig. 105

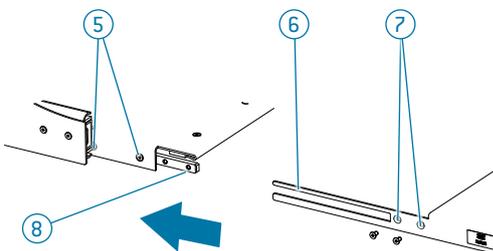


Fig. 106

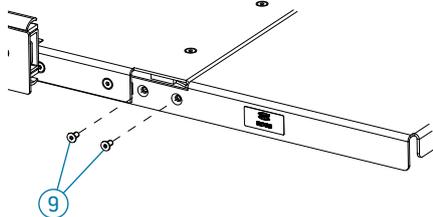


Fig. 107

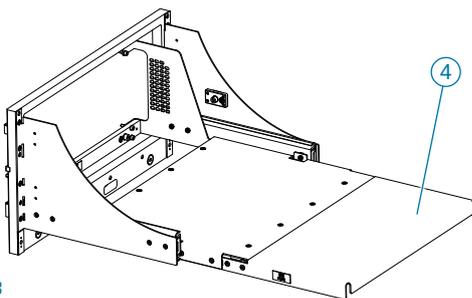


Fig. 108

### Assembling the extension plate

- ▶ Push the slide mount (1) in fully.
- ▶ Position the extension platform (4) so the guide slots (3) align with the holders on the slide mount (2).
- ▶ Push the guides of the platform extension (6) onto the holders (8) of the slide mount.
- ▶ Make sure the platform extension does not tilt as you are pushing it in.
- ▶ Position the platform extension so the holes for the fixing screws (7) sit over the threaded holes (5) on both sides.
- ▶ Secure the platform extension (4) with the screws (9). Take note of the specified tightening torque.

### NOTICE

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see Section 6.16.

- ① Slide mount pushed in
- ② Left and right holders
- ③ Left and right guide slots
- ④ Platform extension
- ⑤ Threaded holes
- ⑥ Guides of the platform extension
- ⑦ Holes for fixing screws
- ⑧ Holders of the slide mount
- ⑨ Screws [2x2]

## 6.13 Mounting the customer adapter housing

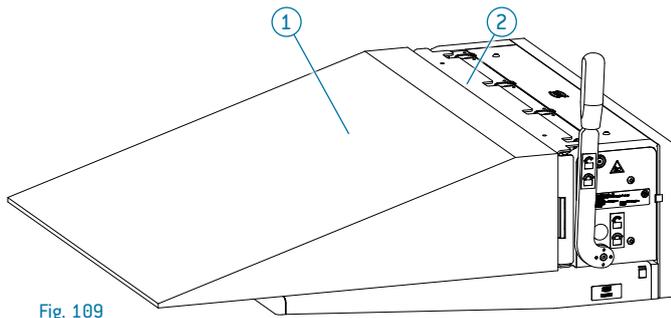


Fig. 109

- For a customer housing, the dimensions listed in Fig. 111 for Size TWO and Fig. 112 for size FOUR must be observed for mounting the adapter (ITA).

### Assembling the adapter on the adapter housing provided by the customer

- ▶ Position the adapter housing (1) in a way that the screw-on points of the adapter (2) are aligned with the adapter housing.
- ▶ Screw the adapter (2) to the adapter housing using the pre-assembled screws (3).
- ▶ Adapter (2) must be able to float on adapter housing (1).

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see Section 6.16 .

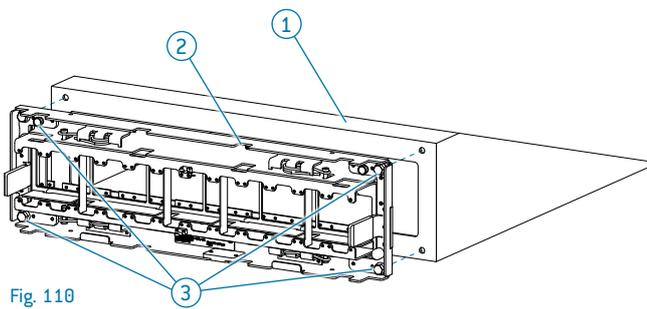


Fig. 110

- ① Adapter housing
- ② Adapter
- ③ Preassembled screws

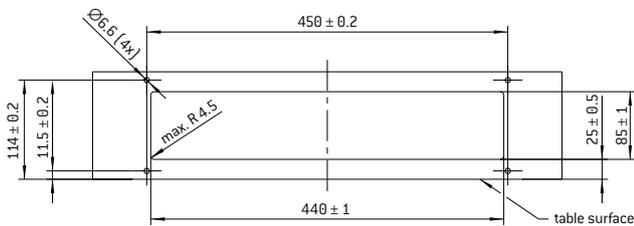


Fig. 111

panel cut out adapter size TWO

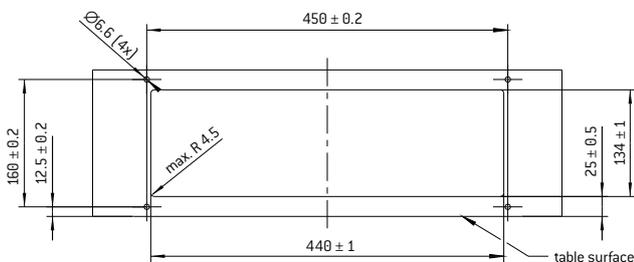


Fig. 112

panel cut out adapter size FOUR

### 6.13.1 Assembly of alignment system onto adapter housing provided by the customer

- If using the 15" platform or the tabletop housing including platform, the manufacturer recommends assembling an alignment system.
- The alignment system must be assembled on the underside of the adapter (ITA) housing provided by the customer, as per the drawings. The customer must create the necessary holes and provide the mounting materials.
- The example (see Fig. 113) shows the assembled adapter alignment system for the platform Part-Nr. 638.050.000.000.003.

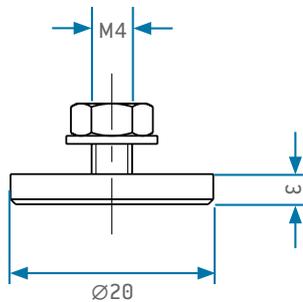


Fig. 113

- ▶ Assemble the alignment system as per the drawings on the left.
- ▶ You can add more adapter feet in the shaded area. Maximum height of adapter feet: 15 mm

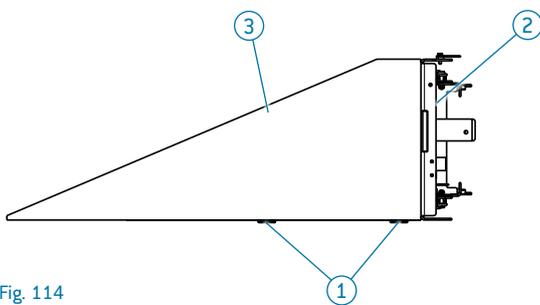


Fig. 114

- ① Adapter alignment system for platform
- ② Adapter (ITA)
- ③ Adapter (ITA) housing provided by the customer

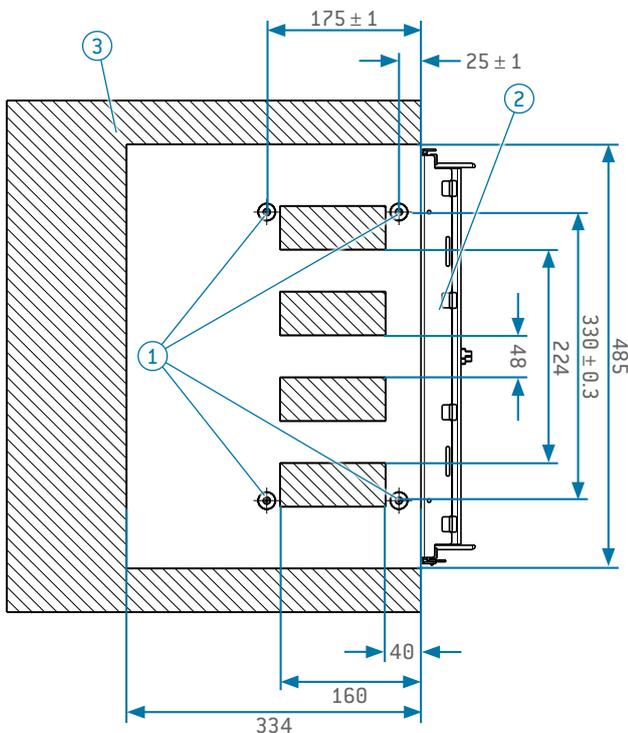


Fig. 115

All dimensions are in mm.

## 6.14 Assembling the enclosure on the adapter (ITA)

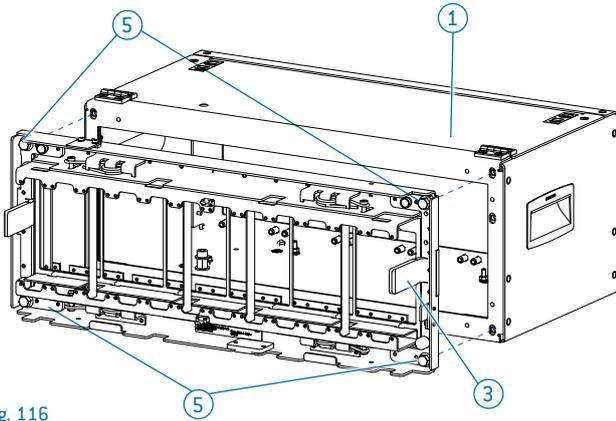


Fig. 116

- For mounting either the FOUR A adapter (ITA) (3) or the TWO M adapter (ITA) (4) the appropriate enclosure must be used
- In addition an adapter plate (6) is required when mounting the TWO M Adapter to the size FOUR enclosure.
- The illustrations are exemplary for the 9" and the 15" enclosures

### Fitting the FOUR A adapter to the enclosure

- ▶ Attach the FOUR A adapter (3) to the matching enclosure (1).
- ▶ Use the fastening screws (5) to mount the FOUR A adapter (3) to the enclosure (1).
- ▶ See Fig 116

### Fitting the TWO M adapter to the electronics housing to the enclosure

- ▶ Attach the TWO M adapter (4) to the matching enclosure (2).
- ▶ Use the fastening screws (5) to mount the TWO M adapter (4) to the enclosure (2).
- ▶ See Fig 117

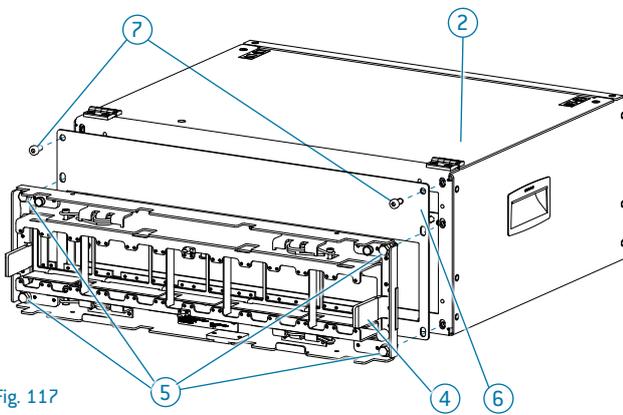


Fig. 117

### NOTICE

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques. For details of screws, nuts, and tightening torques, see Section 6.16.

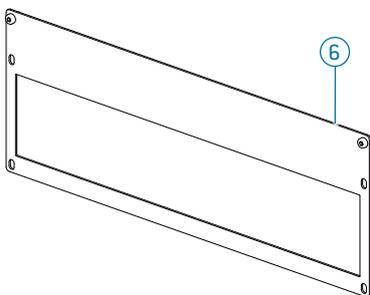


Fig. 118

- |                              |                        |
|------------------------------|------------------------|
| ① 12 Flex FOUR Enclosure 9"  | ⑥ Adapter plate        |
| ② 12-Flex FOUR Enclosure 15" | ⑦ Screws adapter plate |
| ③ 12Flex FOUR Adapter        | ⑧ Hexagon nuts         |
| ④ 12 Flex TWO Adapter        | ⑨ Mounting Brackets    |
| ⑤ Preassembled screws        |                        |

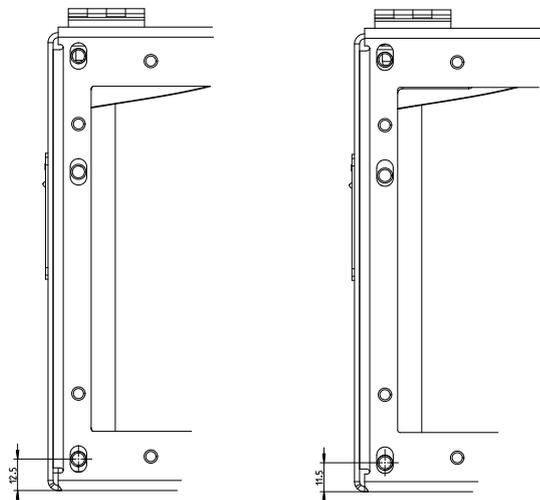


Fig. 119

Fig. 120

- In Fig 119 & 120 you can see the difference between the electronics housings depending on which adapter is to be fitted.
- The internal mounting brackets are pre-assembled with the dimensions shown, depending on the application.
- In Fig. 119 you can see the position of the mounting brackets when a size 4 adapter is attached.
- In Fig. 120 you can see the position of the mounting brackets when a size 2 adapter is attached.

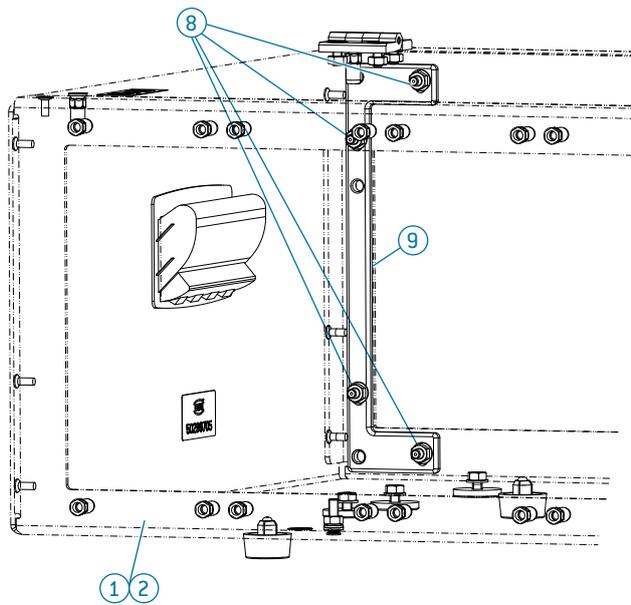


Fig. 121

- By opening the hexagon nuts (8) the mounting bracket (9) can be adjusted as required by sliding it up and down.

### 6.14.1 Assembling the flange plates on the enclosure

- Up to six flange plates (2) can be mounted on the rear wall of the Enclosure (1).
- A selection of different plates can be found in [Section 5.5](#).

#### Mount the flange plate on the enclosure

- ▶ Position the flange plate (2) so that the mounting points on the plate are aligned with those on the enclosure (1).
- ▶ Secure the flange plate (2) with the screws (3).

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques. For details of screws, nuts, and tightening torques, see [Section 6.16](#).

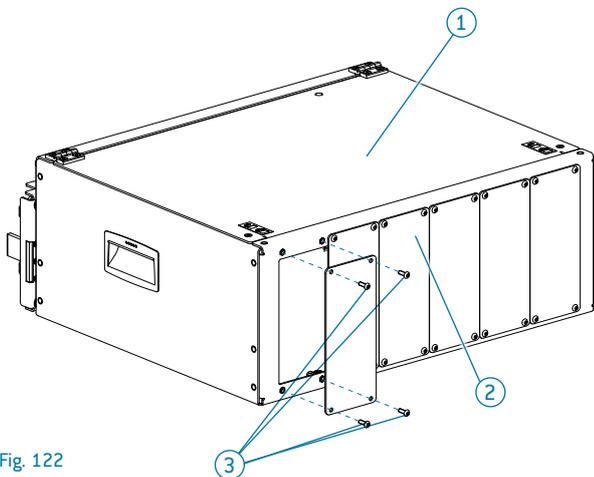


Fig. 122

- ① Enclosure
- ② Flange plate
- ③ Screws

## 6.15 Assembly of strain-relief plate onto the receiver

- Strain must be relieved for outgoing cables leaving the ODU-MAC® Blue-Line frame. This strain-relief plate, which is available as an optional extra, can be used for this purpose.
- The strain-relief plate ① is screwed on at the fixing points for strain relief ② ③.
- The strain-relief plate is assembled in exactly the same way for all 12-Flex receivers.
- The example shows the assembly of a strain-relief plate onto a 12-Flex FOUR A Receiver.

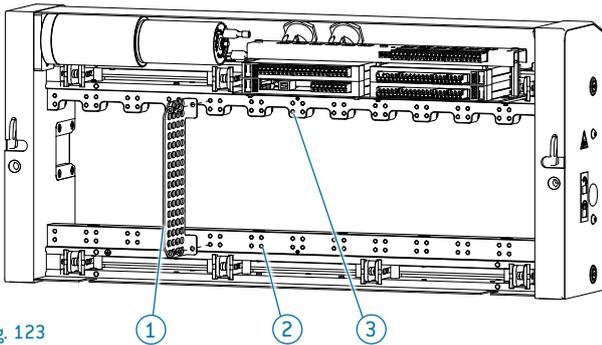


Fig. 123

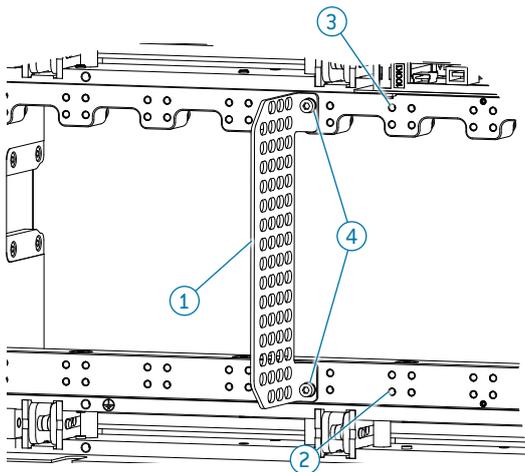


Fig. 124

### Assembling the strain-relief plate

- ▶ Screw the strain-relief plate ① on at the fixing points for strain relief ② ③.

#### **NOTICE**

Two fixing points are available per slot for the strain-relief plate or the protective conductor.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

- ① Strain-relief plate
- ② Bottom strain-relief plate/protective-conductor fixing points
- ③ Top strain-relief plate/protective-conductor fixing points
- ④ Screws

### 6.15.1 Assembly of strain-relief plate onto the adapter (ITA)

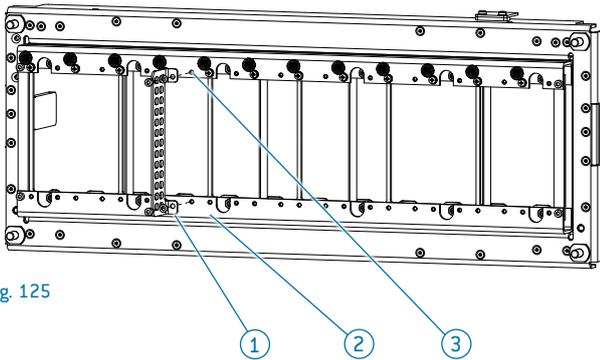


Fig. 125

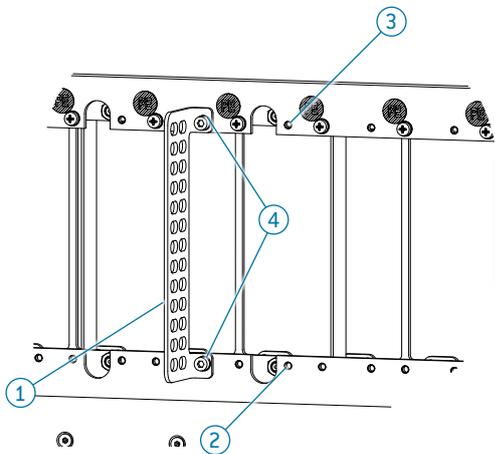


Fig. 126

Tightened condition

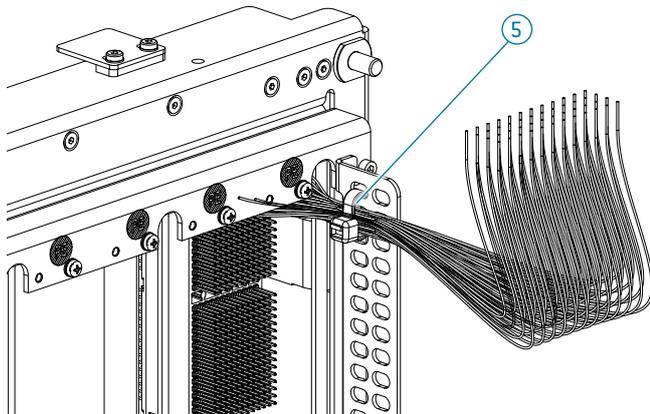


Fig. 127

- Strain must be relieved for outgoing cables leaving the ODU-MAC® Blue-Line frame. This strain-relief plate, which is available as an optional extra, can be used for this purpose.
- The strain-relief plate (1) is screwed on at the fixing points for strain relief (2) (3).
- The strain-relief plate is assembled in exactly the same way for all 12-Flex Adapters.
- The example shows the assembly of a strain-relief plate onto a 12-Flex FOUR A Adapter.
- During the unlocking and locking process, the adapter frame is moved by approx. 16 mm. All cables must absorb this difference by means of a cable loop (6). The cable packages must be fastened to the strain relief (1) with suitable cable ties (5). Make sure that the cable packages contain a reasonable number of cables.

#### Assembling the strain-relief plate

- ▶ Screw the strain-relief plate (1) on at the fixing points for strain relief (2) (3).

**NOTICE**

Two fixing points are available per slot for the strain-relief plate or the protective conductor.

**NOTICE**

Take note of the specified tightening torques and numbers of screws!

For details of screws, nuts, and tightening torques, see [Section 6.16](#)

- ① Strain-relief plate
- ② Bottom strain-relief plate/protective-conductor fixing points
- ③ Top strain-relief plate/protective-conductor fixing points
- ④ Screws
- ⑤ Cable tie to strain relief
- ⑥ Cable loop

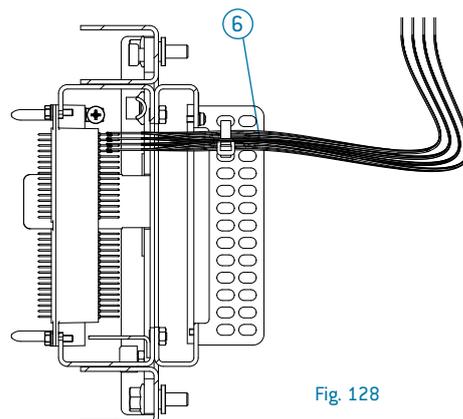


Fig. 128

Relieved state

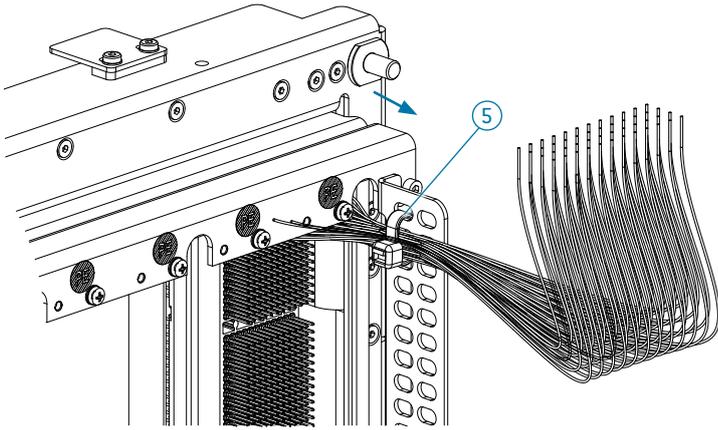


Fig. 129

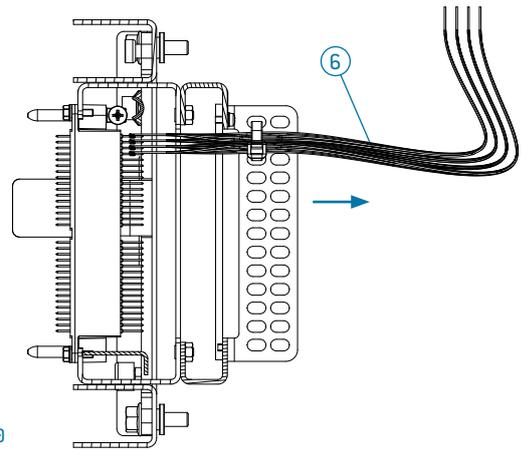


Fig. 130



## 6.16 Table of mounting specifications for components

### WARNING

**Danger from improper mounting of components!**

**Improper mounting of components can lead to accidents and cause injury.**

- ▶ Take note of the specified tightening torque when mounting the components.
- ▶ Use screws and nuts according to the specifications in these instructions.
- ▶ Use the specified number of screws and nuts.

Component	Mounting on	Tightening torque [Nm]	Prescribed screws
<b>Fixed mounting frames</b>			
12-Flex FOUR A Receiver fixed mounting frame with platform flange 637.040.412.000.006	For mounting the receiver on the fixed mounting frame	2.2 ± 0.25	4 x cylinder screw M4x20 2 x cylinder screw M4x10 Hexagon wrench 3 mm
	Mounting on the control cabinet	–	8 x M6 cylinder screw Screws not included in the scope of delivery
12-Flex FOUR A Receiver fixed mounting frame without platform flange 637.040.412.000.005	For mounting the receiver on the fixed mounting frame	2.2 ± 0.25	4 x cylinder screw M4x20 2 x cylinder screw M4x10 Hexagon wrench 3 mm
	Mounting on the control cabinet	–	6 x M6 cylinder screw Screws not included in the scope of delivery
12-Flex TWO M Receiver fixed mounting frame with platform flange 637.040.212.000.006	For mounting the receiver on the fixed mounting frame	2.2 ± 0.25	4 x cylinder screw M4x20 2 x cylinder screw M4x30 Hexagon wrench 3 mm
	Mounting on the control cabinet	–	6 x M6 cylinder screw Screws not included in the scope of delivery
12-Flex TWO M Receiver fixed mounting frame without platform flange 637.040.212.000.005	For mounting the receiver on the fixed mounting frame	2.2 ± 0.25	4 x cylinder screw M4x20 2 x cylinder screw M4x30 Hexagon wrench 3 mm
	Mounting on the control cabinet	–	4 x M6 cylinder screw Screws not included in the scope of delivery
<b>Slide mounts</b>			
12-Flex FOUR A Receiver slide mount with platform flange 637.040.412.000.001	For mounting the receiver on the slide mount	2.2 ± 0.25	4 x cylinder screw M4x20 2 x cylinder screw M4x10 Hexagon wrench 3 mm
	Mounting on the control cabinet	–	8 x M6 cylinder screw Screws not included in the scope of delivery
12-Flex FOUR A Receiver slide mount without platform flange 637.040.412.000.002	For mounting the receiver on the slide mount	2.2 ± 0.25	4 x cylinder screw M4x20 2 x cylinder screw M4x10 Hexagon wrench 3 mm
	Mounting on the control cabinet	–	6 x M6 cylinder screw Screws not included in the scope of delivery
12-Flex TWO M Receiver slide mount with platform flange 637.040.212.000.001	For mounting the receiver on the slide mount	2.2 ± 0.25	4 x cylinder screw M4x20 2 x cylinder screw M4x30 Hexagon wrench 3 mm
	Mounting on the control cabinet	–	6 x M6 cylinder screw Screws not included in the scope of delivery

Component	Mounting on	Tightening torque [Nm]	Prescribed screws
12-Flex TWO MReceiver slide mount without platform flange 637.040.212.000.002	For mounting the receiver on the slide mount	2.2 ± 0.25	4 x cylinder screw M4x20 2 x cylinder screw M4x30 Hexagon wrench 3 mm
	Mounting on the control cabinet	–	4 x M6 cylinder screw Screws not included in the scope of delivery

#### Tabletop housing

12-Flex TWO M Tabletop-cover 637.040.212.000.004	For mounting the receiver on the tabletop housing	4.0 ± 0.4	4 x screw M5x10 Hexagon wrench 4 mm
	Mounting of sealing caps for cable outlets	0.9 ± 0.1	M3x5 countersunk screw Hexagon wrench 2 mm

#### Platform extension

200 mm platform extension for slide mount 637.040.012.000.001	For mounting on the slide mount	2.2 ± 0.25	4 x countersunk screw M4 x 8 Hexagon wrench 2.5 mm
12-Flex TWO/FOUR adjustable table support set 637.040.000.000.001	12-Flex TWO/FOUR platform 15" and 20"	8.0 ± 0.4	Cylinder screw M6 x 25 Hexagonal wrench 5 mm
Table support base (part of 637.040.000.000.001)	Adjustable table support set	10.0 ± 0.5	M8 nut Hexagonal wrench 13 mm See <a href="#">Section 6.16</a>

#### 15" and 20" platform

12-Flex TWO/FOUR 15" Platform 637.040.012.000.002	For mounting on the platform flange of the fixed mounting frame	8.0 ± 0.4	6 x cylinder screw M6x25 Hexagon wrench 5 mm
12-Flex TWO/FOUR 20" Platform 637.040.012.000.002	For mounting on the platform flange of the fixed mounting frame	8.0 ± 0.4	6 x cylinder screw M6x25 Hexagon wrench 5 mm

#### Keyboard tray for 15" and 20" platform

Keyboard tray 637.040.012.000.003	For mounting on the 15" and 20" platform	8.0 ± 0.4	4 x cylinder screw M6x16 Hexagon wrench 5 mm 4 x cap nut Width across flats 10 mm
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#### RFID application

Holder IFM Reader 638.050.000.000.007	Platform	1.2 ± 0.15	2 x cylinder screw M4x30 Hexagonal wrench 3 mm
IFM Reader	Holder IFM Reader 638.050.000.000.007	0.3 ± 0.1	2 x cylinder screw M3x8 Hexagonal wrench 2.5 mm
Holder Sick Reader 638.050.000.000.007	Kolder IFM Reader 638.050.000.000.007	1.2 ± 0.15	2 x cylinder screw M4x20, Hexagonal wrench 3 mm
Sick Reader	Holder Sick Reader 638.050.000.000.007	2.2 ± 0.25	2 x cylinder screw M5x12 Hexagonal wrench 4 mm

Component	Mounting on	Tightening torque [Nm]	Prescribed screws
<b>Strain-relief plates</b>			
Flex FOUR Receiver strain-relief plate 637.050.400.000.002	For mounting on the receiver	$0.9 \pm 0.1$	2 x cylinder screw M3 x 6 Hexagon wrench 2.5 mm
Flex TWO Receiver strain-relief plate 637.050.200.000.001	For mounting on the receiver	$0.9 \pm 0.1$	2 x cylinder screw M3 x 6 Hexagon wrench 2.5 mm
Flex FOUR Adapter strain-relief plate 638.050.400.000.003	For mounting on the adapter (ITA)	$0.9 \pm 0.1$	2 x cylinder screw M3 x 6 Hexagon wrench 2.5 mm
Flex TWO Adapter strain-relief plate 638.050.200.000.004	For mounting on the adapter (ITA)	$0.9 \pm 0.1$	2 x cylinder screw M3 x 6 Hexagon wrench 2.5 mm
<b>Monoblock and slot cover</b>			
Monoblock on adapter (ITA)	For mounting on the adapter (ITA)	$0.6 \pm 0.1$	4 x M3 Width across flats 5.5 mm
Adapter (ITA) slot cover	For mounting on the adapter (ITA)	$0.6 \pm 0.1$	4 x M3 Width across flats 5.5 mm
<b>ODU-MAC® Blue-Line frame or ODU-MAC® Black-Line frame</b>			
Pin frame on adapter (ITA)	For mounting on the adapter (ITA)	$0.6 \pm 0.1$	4 x M3 Width across flats 5.5 mm
<b>Resistance coding</b>			
Resistance-coding block for adapter (ITA) 638.050.000.000.001	For mounting on the adapter (ITA)	$0.6 \pm 0.1$	2 x countersunk screw M3 x 14 Hexagon wrench 2 mm
Resistance coding receiver	Receiver	$0.9 \pm 0.1$	2 x cylinder screw M3 x 14 Hexagonal wrench 2.5 mm
Side panel cover	Receiver	$2.2 \pm 0.2$	2 x cylinder screw M4 x 8 Hexagonal wrench 2.5 mm
<b>Adapter housing</b>			
Adapter housing provided by the customer	For mounting on the adapter (ITA)	Max. $8.0 \pm 4.0$	4 x cylinder screw M6x20 Hexagon wrench 5 mm
<b>Alignment system</b>			
Adapter alignment system 638.050.000.000.003	For mounting on the adapter housing provided by the customer	$2.2 \pm 0.25$	4 x M4 x 10 hexagon wrench 2.5 mm 4 x nut M4 width across flats 7 mm
<b>Hand lever</b>			
Hand lever for Flex TWO Receiver	For mounting on the receiver	$2.2 \pm 0.25$	1 x cylinder screw M4 x 18 Hexagon wrench 3 mm
Receiver hand lever extension 100 mm 637.052.000.000.001	For mounting on the receiver	$2.2 \pm 0.25$	1 x cylinder screw M4 x 120 Hexagon wrench 3 mm
Hand lever extension 30 mm 637.052.000.000.002	Receiver	$2.2 \pm 0.25$	1 x cylinder screw M4 x 50 Hexagonal wrench 3 mm
<b>Enclosure</b>			
12-Flex FOUR Enclosure flange plate 638.208.902.000.026	Fastening the flange plate to the enclosure	$1.2 \pm 0.15$	8 x fillister head screw M4x12 Hexagon wrench 2.5 mm

Component	Mounting on	Tightening torque [Nm]	Prescribed screws
FOUR Enclosure flange plate, double (without cut-out) 638.040.212.000.016	Fastening the flange plate to the enclosure	$1.2 \pm 0.15$	8 x fillister head screw M4x12 Hexagon wrench 2.5 mm
FOUR Enclosure flange plate (without cut-out) 638.040.212.000.012	Fastening the flange plate to the enclosure	$1.2 \pm 0.15$	8 x fillister head screw M4x12 Hexagon wrench 2.5 mm
FOUR Enclosure flange plate for bulkhead housings 638.040.212.000.006	Fastening the flange plate to the enclosure	$1.2 \pm 0.15$	8 x fillister head screw M4x12 Hexagon wrench 2.5mm
FOUR Enclosure flange plate for ODU-MAC® Rapid 638.040.212.000.008	Fastening the flange plate to the enclosure	$1.2 \pm 0.15$	8x fillister head screw M4x12 Hexagon wrench 2.5 mm
FOUR Enclosure flange plate for cable feedthroughs 638.040.212.000.010	Fastening the flange plate to the enclosure	$1.2 \pm 0.15$	8 x fillister head screw M4x12 Hexagon wrench 2.5 mm
FOUR Enclosure flange plate 8x D-SUB 15-pin 638.040.212.000.014	Fastening the flange plate to the enclosure	$1.2 \pm 0.15$	4 x fillister head screw M4x12 Hexagon wrench 2.5 mm
Screw plug for service flap 638.040.412.000.001 638.040.412.000.002 638.040.412.000.004 638.040.412.000.003	To close the service flap	$1.2 \pm 0.15$	2 x countersunk screw M4x10 Hexagon wrench 2.5 mm
Enclosure 9" and 15" 638.040.412.000.001 638.040.412.000.002 638.040.412.000.004 638.040.412.000.003	Mounting brackets on the enclosure	$2.2 \pm 0.25$	8x Hexagon nut M4
12-Flex FOUR Enclosure adapter plate for TWO M Adapter 638.040.212.000.017	Fastening the adapter plate to the enclosure	$8.0 \pm 0.4$	2 x cylinder screw M6x12 Hexagon wrench 4 mm
12-Flex FOUR A Adapter 638.021.412.100.001	Fastening the adapter to the housing	$8.0 \pm 0.4$	2 x cylinder screw M6x12 Hexagon wrench 4 mm
12-Flex TWO M Adapter 638.022.212.100.001	Fastening the adapter to the housing	$8.0 \pm 0.4$	2 x cylinder screw M6x12 Hexagon wrench 4 mm

## 6.17 Table of mounting specifications for protective-conductor terminals

Component	Mounting on	Tightening torque [Nm]	Prescribed screws
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### Tightening torques for structural parts of the protective connection

12-Flex FOUR A Receiver	Slide mount/fixed mounting frame	$2.2 \pm 0.25$	4 x cylinder screw M4 x 20 2 x cylinder screw M4 x 10 Hexagon wrench 3 mm
12-Flex TWO M Receiver	Slide mount/fixed mounting frame	$2.2 \pm 0.25$	4 x cylinder screw M4 x 20 2 x cylinder screw M4 x 30 Hexagon wrench 3 mm

Component	Mounting on	Tightening torque [Nm]	Prescribed screws
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### Protective-conductor terminals

12-Flex FOUR A Receiver	Fixing point for protective conductor	$1.2 \pm 0.15$	Cylinder screw M4 (not included in the scope of delivery) Hexagon wrench 3 mm
12-Flex TWO M Receiver	Fixing point for protective conductor	$1.2 \pm 0.15$	Cylinder screw M4 (not included in the scope of delivery) Hexagon wrench 3 mm
12-Flex TWO M Tabletop receiver	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex FOUR A Receiver slide mount with platform flange	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex FOUR A Receiver slide mount without platform flange	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex TWO M Receiver slide mount with platform flange	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex TWO M Receiver slide mount without platform flange	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex FOUR A Receiver fixed mounting frame with platform flange	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex FOUR A Receiver fixed mounting frame without platform flange	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex TWO M Receiver fixed mounting frame with platform flange	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex TWO M Receiver fixed mounting frame without platform flange	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 (not included in the scope of delivery) Hexagon wrench 5 mm
12-Flex TWO M Receiver tabletop housing	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 x 6 (not included in the scope of delivery) Hexagon wrench 5 mm
ODU-MAC® Black-Line frame	Fixing point for protective conductor on ODU-MAC® Black-Line frame and adapter	$1.2 \pm 0.15$	2 x fillister screw M3 x 6 Phillips cross-head screwdriver size 1

Component	Mounting on	Tightening torque [Nm]	Prescribed screws
12-Flex FOUR Enclosure 9" /15" 638.040.412.000.002 638.040.412.000.001 638.040.412.000.004 638.040.412.000.003	Fixing point for protective conductor	$3.0 \pm 0.3$	Cylinder screw M6 x 6 Screw drive Hexagon socket 5 mm
12-Flex FOUR Enclosure 9" /15" 638.040.412.000.002 638.040.412.000.001 638.040.412.000.004 638.040.412.000.003	Fixing point for protective conductor	$1.2 \pm 0.15$	Nut M4 Width across flats 7 mm

# 7. ELECTRIC CONNECTION AND CONTROL

Read the safety information below before establishing an electric connection and take note of the measures described therein designed to ensure safe electric connection.

## 7.1 Safety information relating to electric connection and control

**⚠ DANGER** Danger from electric energy stored in components such as

**capacitors or inductors (e.g., relays, motors)!**

**When the motor decelerates, it runs in generator mode and feeds back to the power supply. This return feed can lead to voltage peaks of up to 42 V.**

**Touching live components can lead to an electric shock.**

- ▶ Use a power supply that is safe against return feed with a minimum capacity (within the power supply or external) of 6600 µF to limit the return voltage to a maximum of 30 V.
- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Wear personal protective equipment.
- ▶ Use additional protective equipment as appropriate for the work at hand.
- ▶ Observe additional safety precautions throughout the whole system during automatic operation.
- ▶ Provide emergency-stop functions in the higher-level system.

**i NOTICE** If the Sigmatek controller is connected to an IP network containing devices that do not run on a Sigmatek operating system, it can cause problems.

Ethernet packets (e.g., broadcasts) may then be sent to the Sigmatek controller at such a high frequency that the high interrupt load causes a realtime runtime error or a runtime error in the Sigmatek controller.

If this happens, configure a corresponding packet filter (firewall or router).

### Connectors to use

The connectors required are included in the scope of delivery. If necessary, use only the following connectors:

Item	Manufacturer	Manuf. Part number
BCF 3.81 / 03 / 180 SN BK BX	Weidmüller	1969920000
FMC 1.5 / 3-ST-3.5 Gray / Blue	Phoenix-Contact	1705386
FMC 1.5 / 4-ST-3.5 Gray / Blue	Phoenix-Contact	1714992
FMC 1.5 / 5-ST-3.5 Gray / Blue	Phoenix-Contact	1705390
FMC 1.5 / 8-ST-3.5 Gray / Blue	Phoenix-Contact	1707473

## 7.2 Pin assignment for +24 V / 0 V distributor

### 7.2.1 Module layout

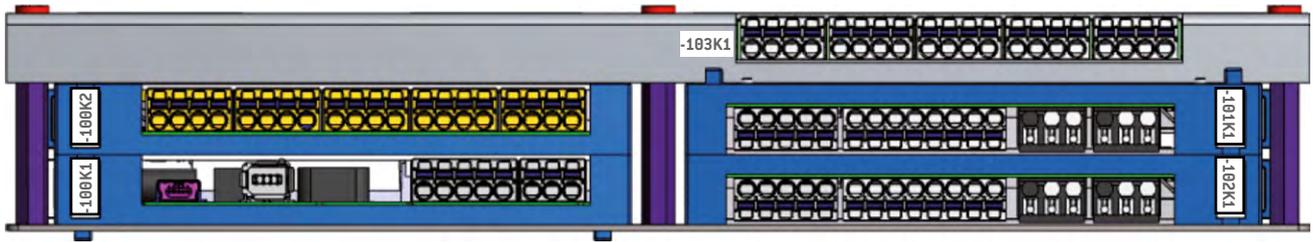


Fig. 131

### 7.2.2 Controller delivery condition in standalone operation

Power supply  
L+ / M  
24 V DC

Power-supply fuses  
Fuse provided by the customer (max. T3A)

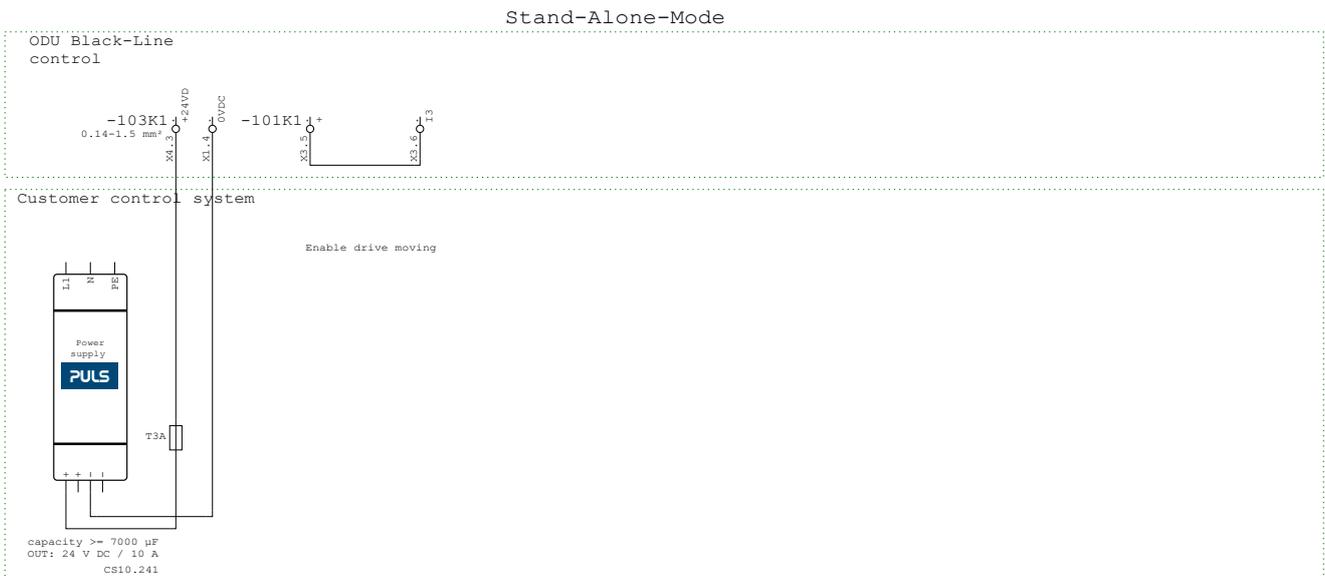


Fig. 132

### 7.3.1 Connection to remote customer controller (inline operation)

Power supply  
L+ / M  
24 V DC

Power-supply fuses  
Fuse provided by the customer (max. T3A)

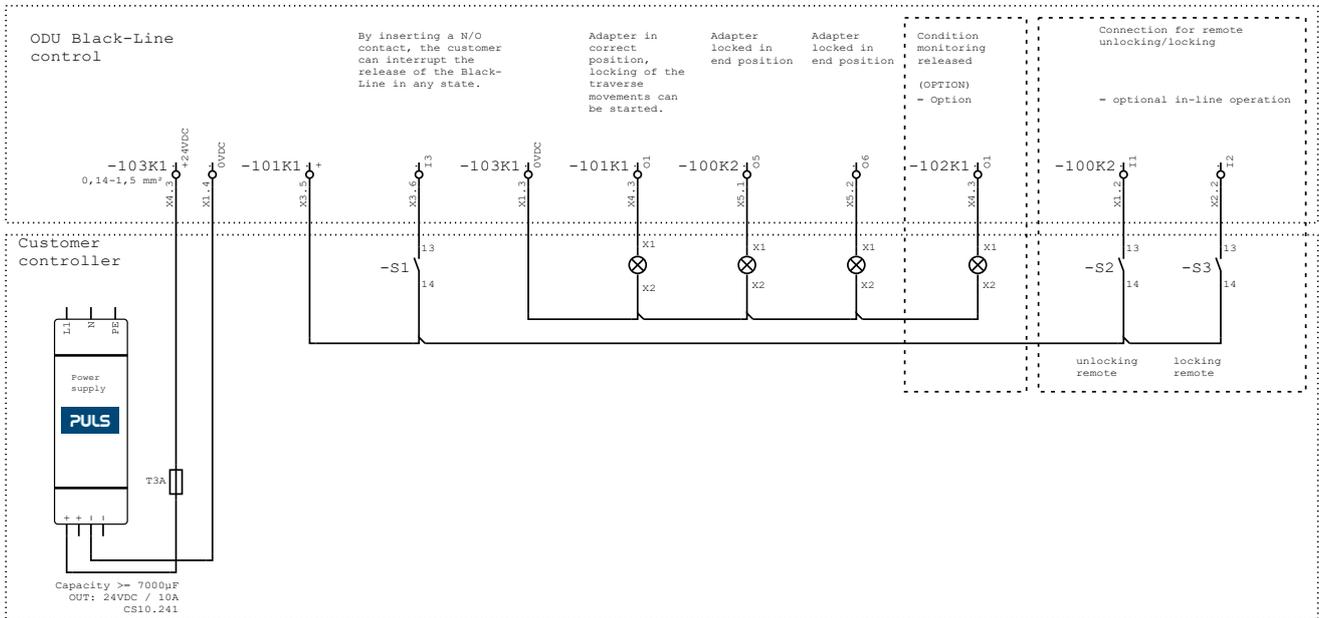


Fig. 133

### 7.3 Pin assignment for controller

#### **NOTICE**

A connection can be established with CANopen.  
Please contact ODU to discuss.  
For contact details, see [Section 13](#).

### 7.3.2 Controller (up to software release 1.6)

#### In-line operation

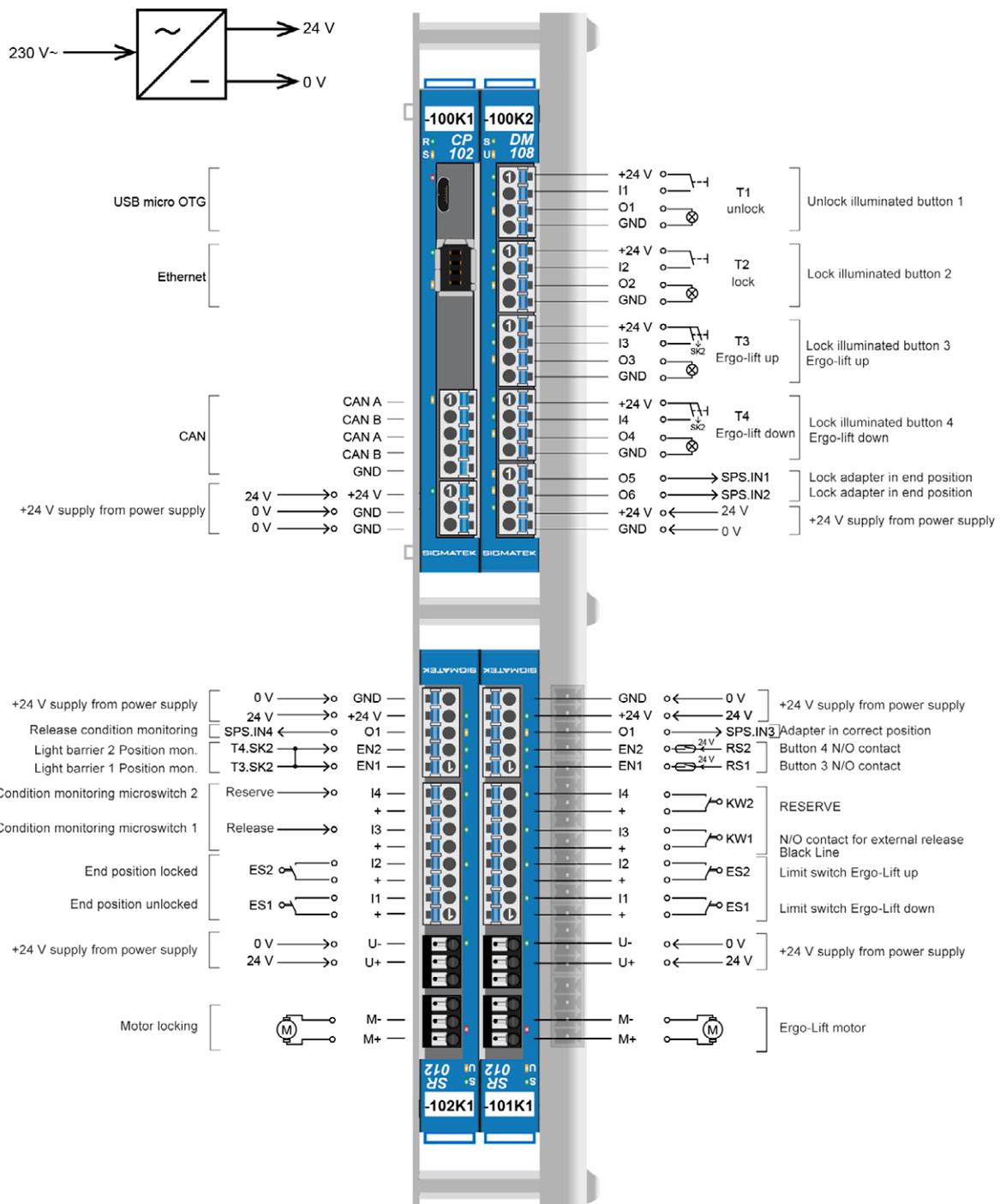


Fig. 134

## Pin assignments

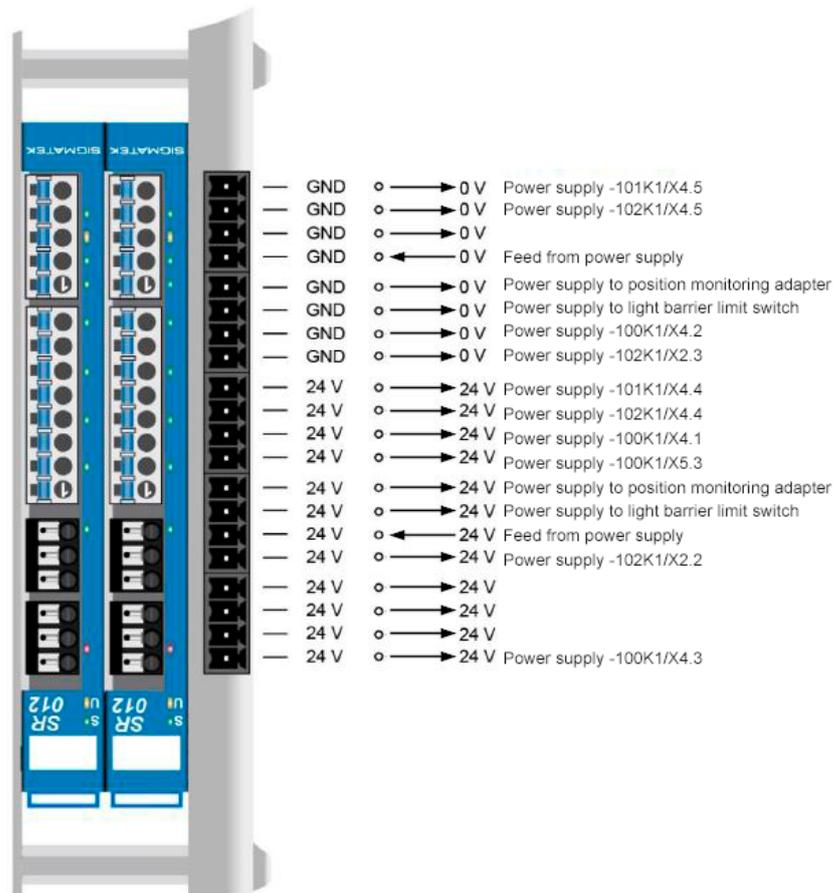


Fig. 135

### 7.3.3 Controller (from software release 1.7)

#### In-line operation

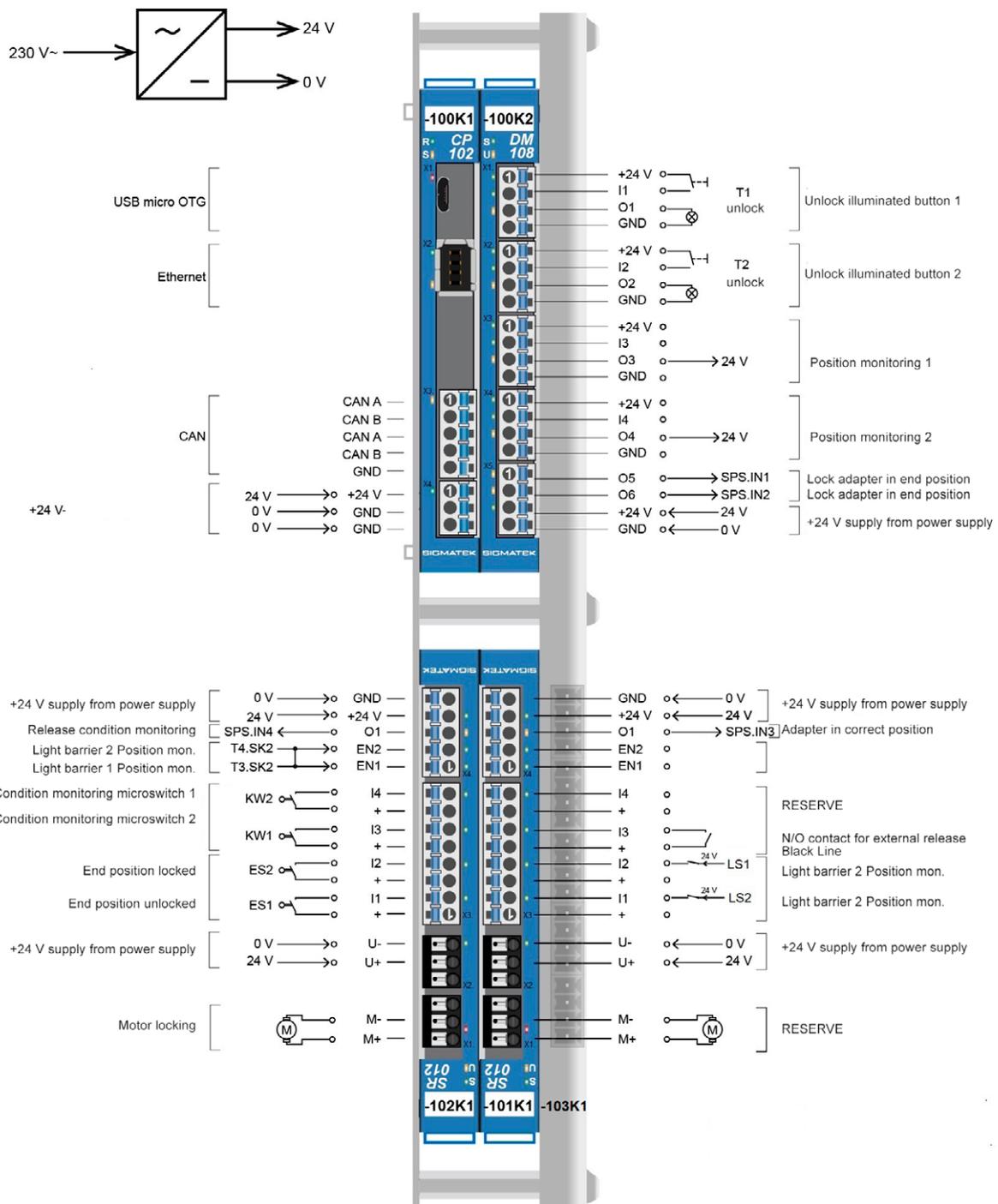


Fig. 136

# Pin assignments

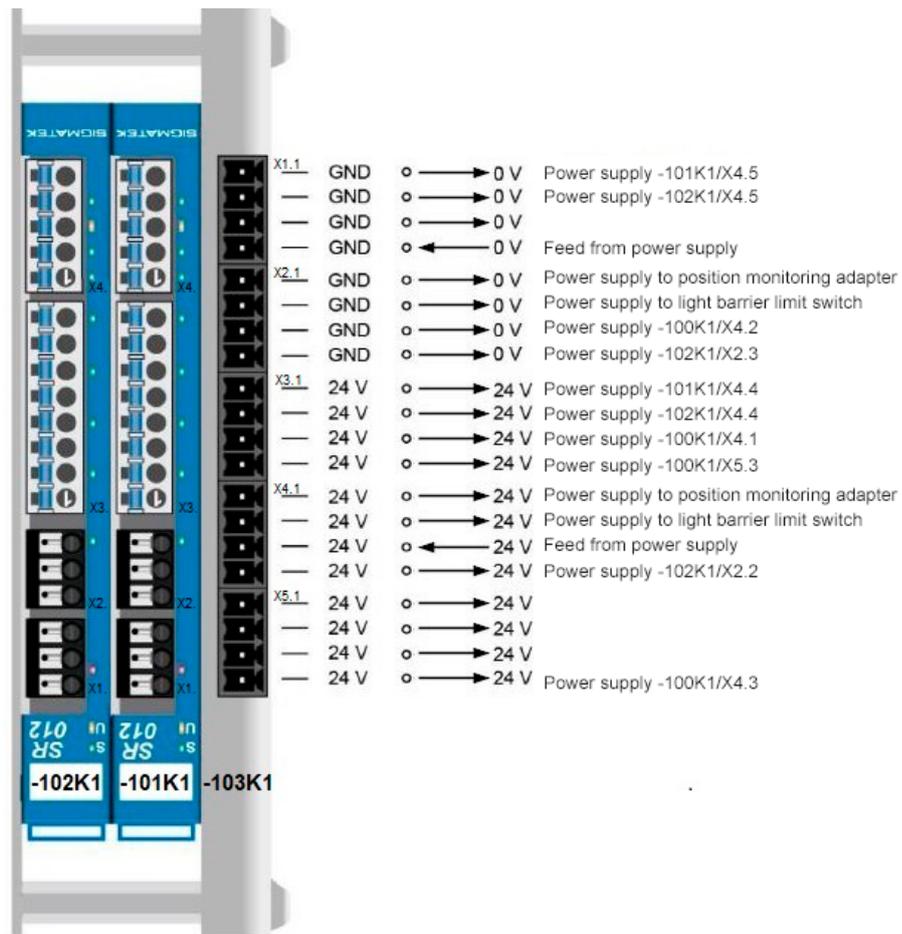


Fig. 137

## Time-distance diagram

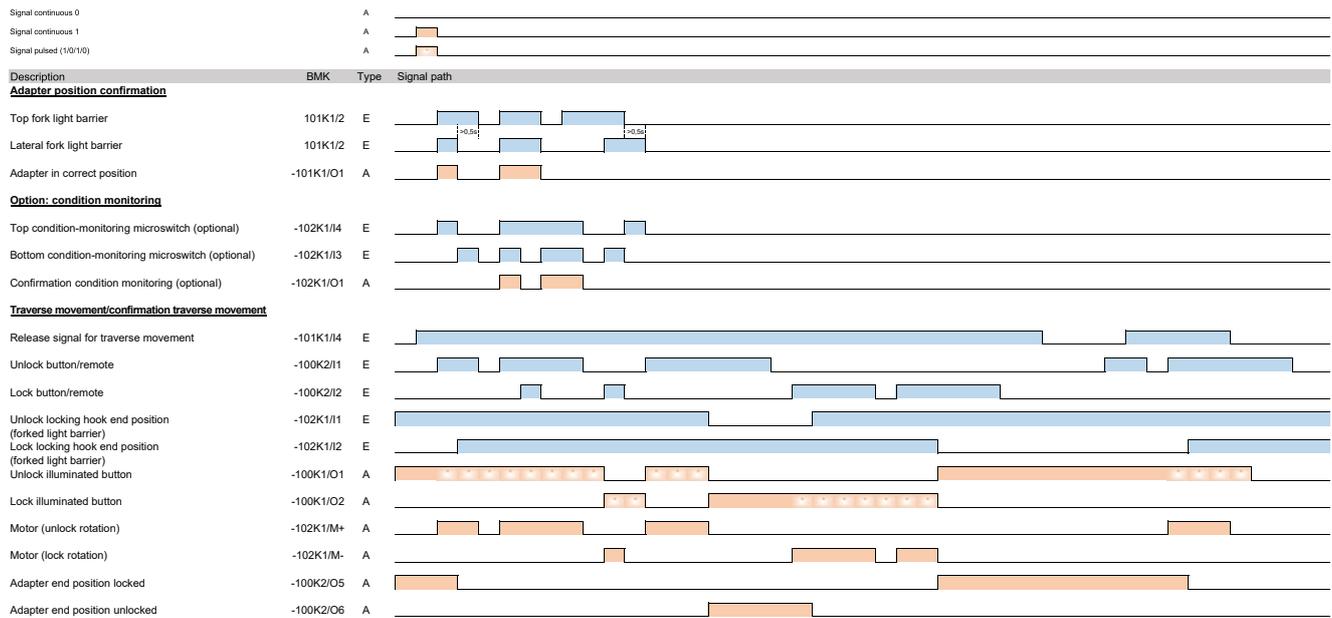


Fig. 138

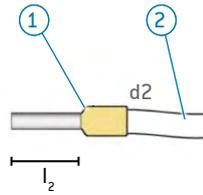
The ODU-MAC Black-Line® can be connected to enable “In-Line operation” as shown in Figure 131 (in-line operation). Figure 134 / 135 / 136 / 137 (connection positions) shows the assignment on the controller. Figure 133 (time-distance diagram) shows the temporal relationships of the sensors and actuators.

By inserting a normally open contact [-101K1 X3.5 and X3.6], the release for the travel movement can be interrupted (“emergency stop”).

## 7.4 Connector specifications



Fig. 139



Connector with Phoenix spring-type terminal FMC 1.5 / 4-ST-3.5

- ① Wire end ferrule
- ② Cable

Stripping length	10 mm
Mating direction	Parallel to conductor axis or to PCB
Rigid conductor cross-section	0.2 – 1.5 mm <sup>2</sup>
Flexible conductor cross-section	0.2 – 1.5 mm <sup>2</sup>
Conductor cross-section AWG/kcmil	24 – 16
Flexible conductor cross-section with wire end ferrule without plastic sleeve	0.25 – 1.5 mm <sup>2</sup>
Flexible conductor cross-section with wire end ferrule with plastic sleeve	0.25 – 0.75 mm <sup>2</sup> (reduction base d2 of wire end ferrule)

## 7.5 Wiring

**NOTICE** The input filters, which suppress interfering pulses, allow the device to be used in harsh environmental conditions. Establish wiring carefully to guarantee fault-free operation.

**NOTICE** Observe the following:

- ▶ Avoid routing the input cables in parallel with load circuits.
- ▶ Equip all contactor coils with a protective circuit (RC elements or freewheeling diodes).
- ▶ Make sure correct grounding is provided.

The outputs are also connected to an internal protective circuit.

However, an additional protective circuit is also recommended directly at inductive loads (freewheeling diode) to avoid a system malfunction caused by voltage peaks (e.g., crosstalk with analog cables) (EMC Directive).

### 7.5.1 General information on digital outputs

- ▶ The cable cross-section of the +24 V supply and the 0 V supply must be dimensioned for the maximum output current that can be consumed by a group.
- ▶ The outputs can be shut down in groups by shutting down the +24 V power supply.

**NOTICE** It is not permissible to apply a voltage to an output that exceeds the supply voltage by more than 0.7 V.

## 7.5.2 Optional condition monitoring

### Receivers with a controller

For receivers with a controller, condition monitoring can be ordered as an option. In this case, each receiver is equipped with centrally mounted microswitches at the top and bottom. If the receiver is correctly locked, the signal can be tapped at the controller via output –102K1/o1.

### Receivers without a controller

For receivers without a controller, condition monitoring can be ordered as an option. In this case, each receiver is equipped with centrally mounted microswitches at the top and bottom. For receivers without a controller, the cables for the microswitches are not wired and must be integrated into a controller provided by the customer. The microswitches are designed as normally open contacts.

Technical data for connections:

maximum connection voltage and connection current:  
30 V DC; 0.5 A

### 7.5.3 Resistor coding (optional)

- ▶ Loosen the screws (3) that the cover (2) can be removed.
- ▶ The screws (5) of the resistor coding (4) on the receiver (1) must be loosened.
- ▶ The resistor coding (4) can be removed from the receiver (1).
- ▶ After soldering the cables to the resistor coding (4), it can be reinstalled in the receiver (1).
- ▶ Please ensure that the resistor coding (4) lies flat against the side panel.
- ▶ The soldered cables can be routed into the termination area via the cable entry (6).
- ▶ Tighten the screws (5).
- ▶ The cover (2) can be reinstalled on the receiver using the screws (3).

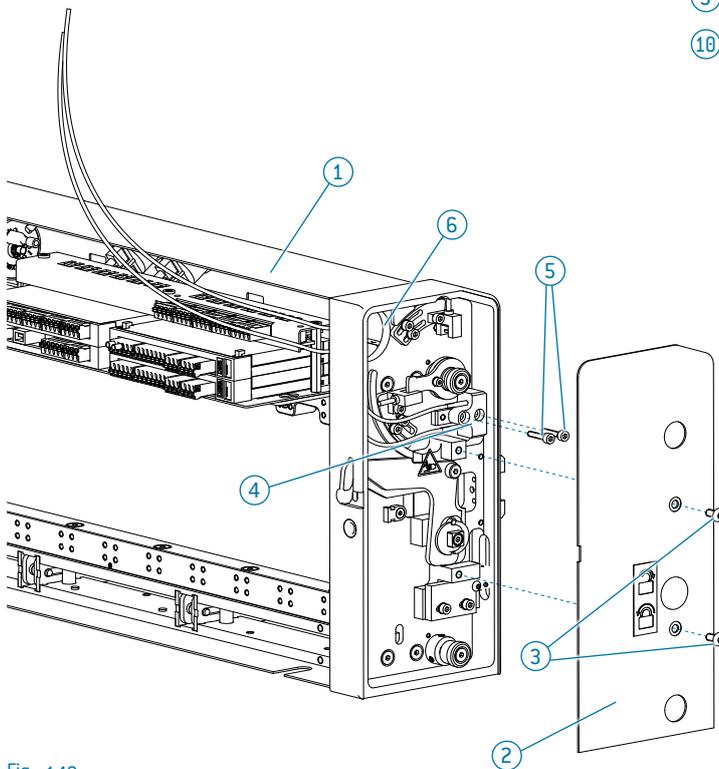


Fig. 140

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

- ① Receiver
- ② Cover
- ③ Screws
- ④ Resistance coding (receiver)
- ⑤ Screws
- ⑥ Cable entry
- ⑦ Adapter
- ⑧ Resistor coding (adapter)
- ⑨ Screws
- ⑩ Resistor (not included in the scope of delivery)

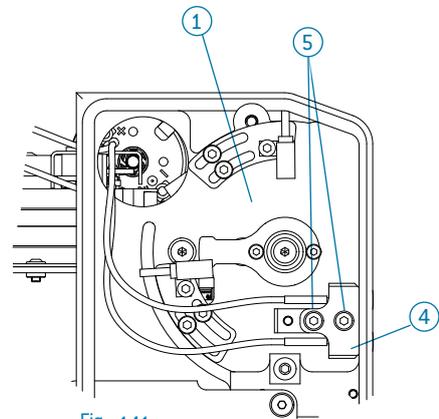


Fig. 141

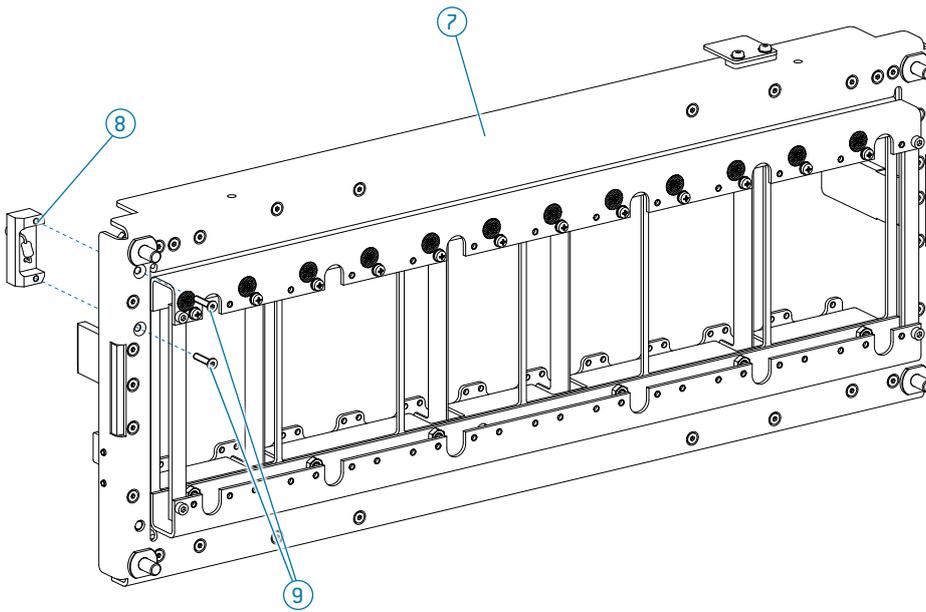


Fig. 142

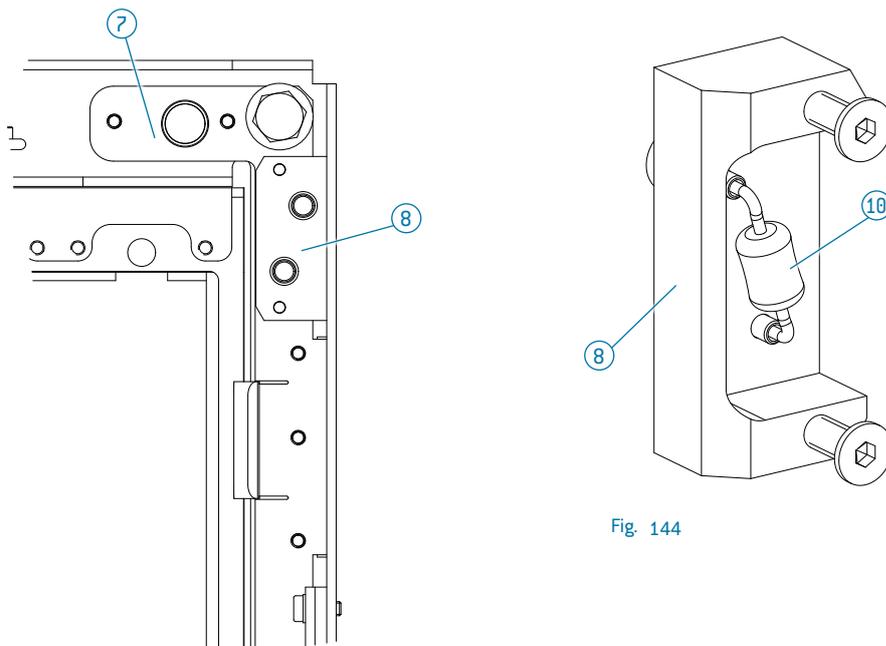


Fig. 143

Fig. 144

- ▶ Solder your selected resistor and cable to the resistor coding **8**.
- ▶ The resistor coding **8** can be connected to the adapter **7** at the position shown in Fig. 142.
- ▶ Please ensure that the resistor coding **8** lies flat and is mounted as shown in Fig 143.
- ▶ Tighten the screws **9**.

## 7.6 Protective-conductor terminal

A protective-conductor terminal is mandatory according to the applicable standards (DIN EN 60204-1:2018, DIN EN 61140:2016, DIN EN 61010-1:2010 Section 6.5) if the "limit values for EXPOSED parts" outlined in the respective standards are exceeded and no other safety precautions to protect against electric shock have been taken.

In all cases, the protective connection and all EXPOSED PARTS must be checked according to the respective standards (DIN EN 60204-1:2018, DIN EN 61010-1:2010 Annex F and Section 6.5.2.4) prior to commissioning.

If the insulation resistance is checked or a voltage test is performed on the "solid insulation", all electronic components of the controller must be disconnected and grounded before this inspection takes place.

- ① Cable lug
- ② Contact washer
- ③ Screw

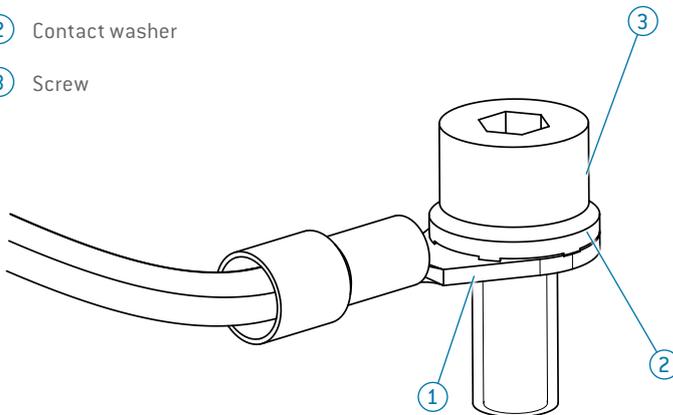


Fig. 145

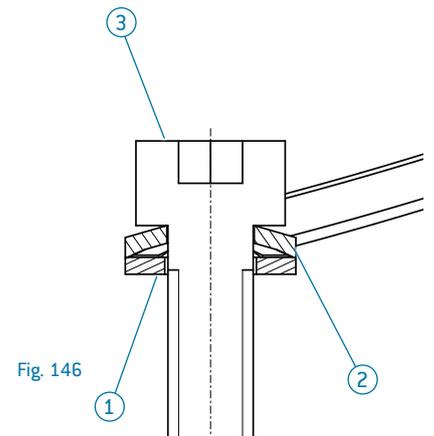


Fig. 146

## 7.6.1 Protective-conductor terminal on the 12-Flex FOUR A Receiver

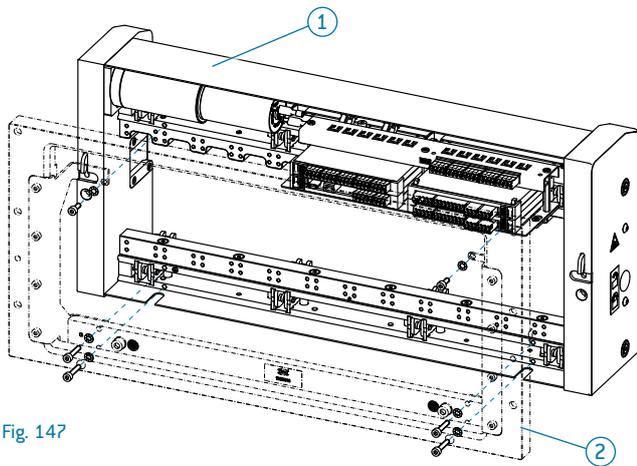


Fig. 147

- If the receiver (1) is operated without additional screw-on parts (2), the protective-conductor terminal should be attached at the position marked (4) in Fig. 149; see [Table Section 6.17](#) for the prescribed torque.

The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

- If the receiver (1) is operated with additional screw-on parts (e.g., fixed mounting frame (2) or slide mount [Section 7.6.4](#)), the protective connection should be attached at the positions (4) marked there. The protective connection is then realized via the mounting points shown (3); comply with the torque specifications in [Table Section 6.17](#) in this case too.

### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- (1) Receiver
- (2) Fixed mounting frame
- (3) Mounting points
- (4) Protective-conductor terminal

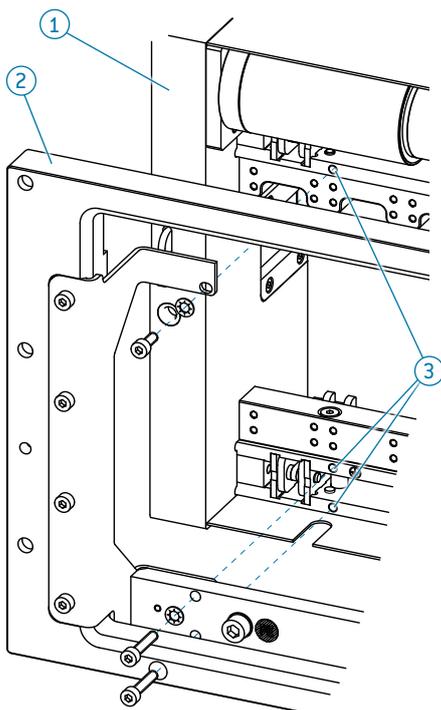


Fig. 148

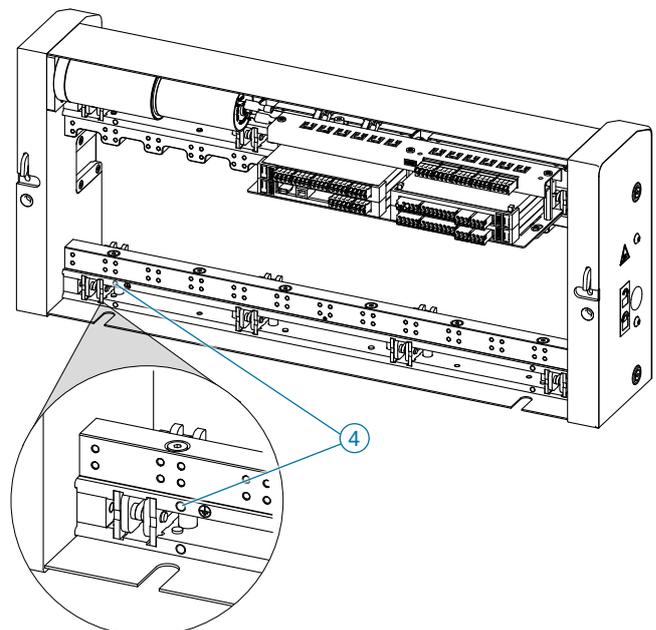


Fig. 149

## 7.6.2 Protective-conductor terminal on the 12-Flex TWO M Receiver

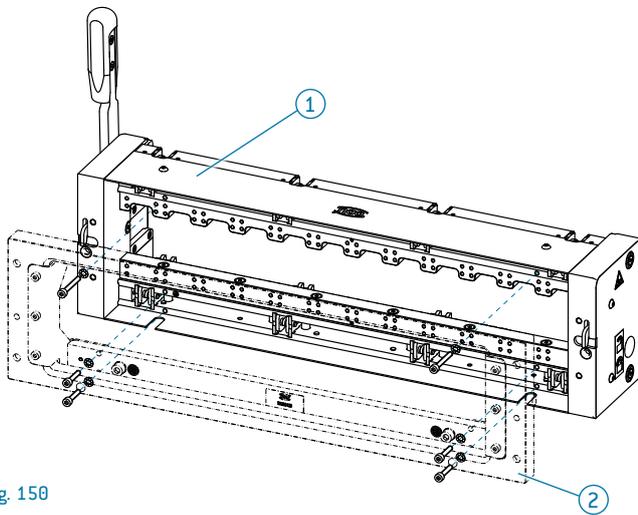


Fig. 150

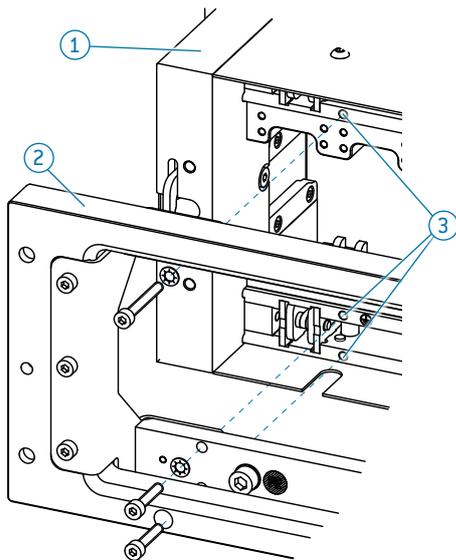


Fig. 151

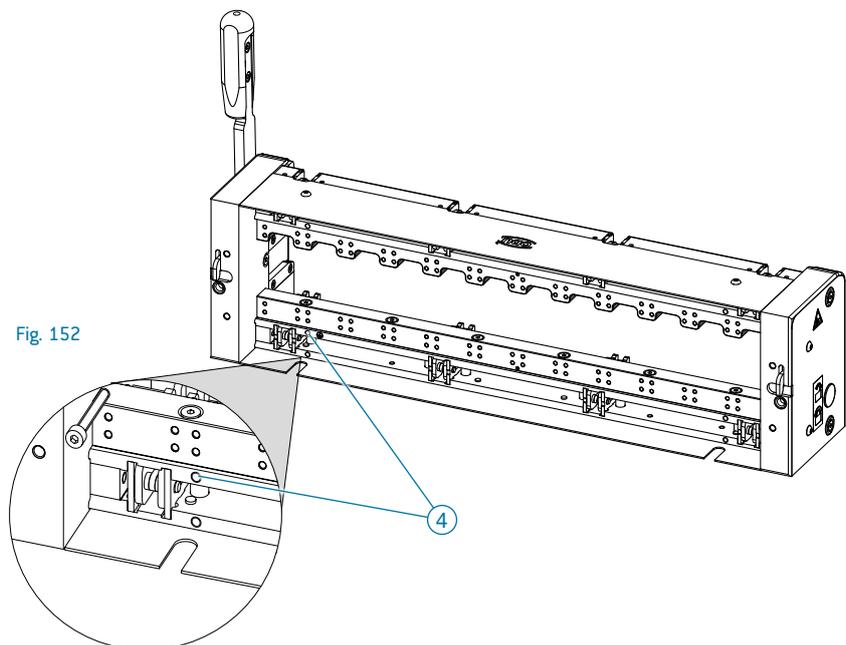


Fig. 152

- If the receiver ① is operated without additional screw-on parts ②, the protective-conductor terminal should be attached at the position marked ④ in Fig. 152; see [Table Section 6.17](#) for the prescribed torque. The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.
- If the receiver ① is operated with additional screw-on parts (e.g., fixed mounting frame ② or slide mount [Section 7.6.3](#)), the protective connection should be attached at the positions ④ marked there. The protective connection is then realized via the mounting points shown ③; comply with the torque specifications in [Table Section 6.17](#) in this case too.

### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Receiver
- ② Fixed mounting frame
- ③ Mounting points
- ④ Protective-conductor terminal

### 7.6.3 Protective-conductor terminal on the 12-Flex TWO M Tabletop receiver

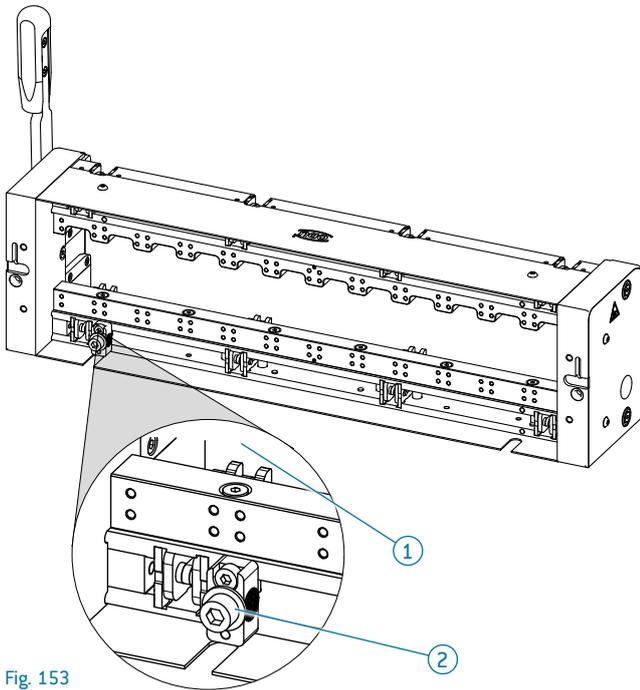


Fig. 153

- On the 12-Flex TWO M Tabletop receiver (1), the protective connection is realized via the protective-conductor terminal (2).
- An M6 thread is provided for the terminal.  
The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- (1) Tabletop receiver
- (2) Protective-conductor terminal

### 7.6.4 Protective-conductor terminal on the 12-Flex FOUR A Receiver slide mount with platform flange

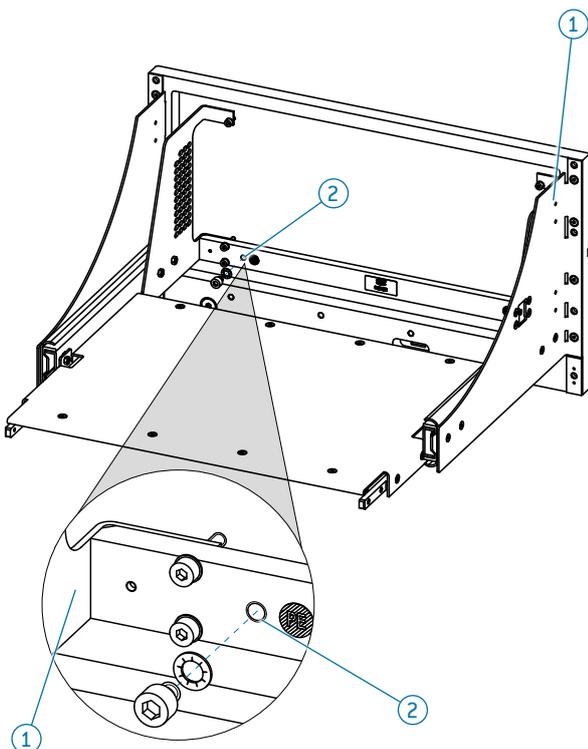


Fig. 154

- On the 12-Flex FOUR A Receiver slide mount with platform flange (1), the protective connection is realized via the protective-conductor terminal (2).
- The protective-conductor terminal is located on both sides of the slide mount.
- An M6 thread is provided for the terminal.  
The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- (1) Slide mount
- (2) Protective-conductor terminal

### 7.6.5 Protective-conductor terminal on the 12-Flex FOUR A Receiver slide mount without platform flange

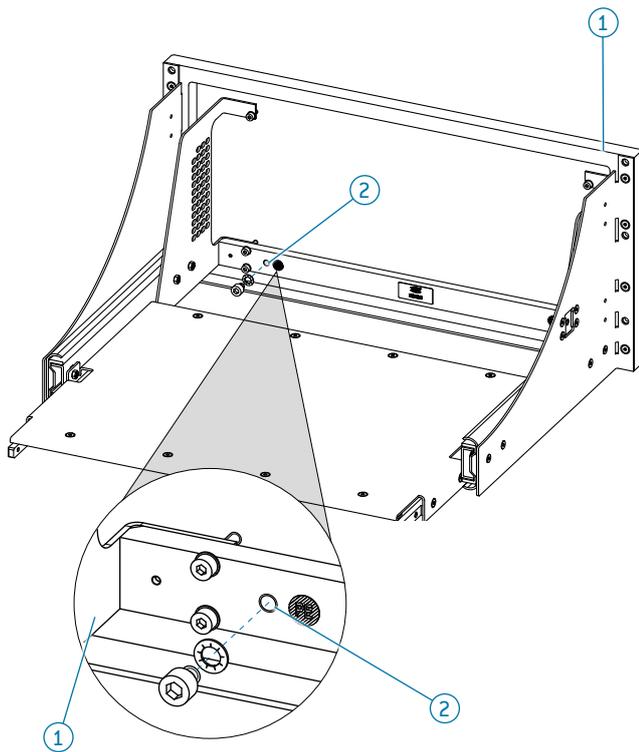


Fig. 155

- On the 12-Flex FOUR A Receiver slide mount without platform flange ①, the protective connection is realized via the protective-conductor terminal ②.
- The protective-conductor terminal is located on both sides of the slide mount.
- An M6 thread is provided for the terminal. The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Slide mount
- ② Protective-conductor terminal

### 7.6.6 Protective-conductor terminal on the 12-Flex TWO M Receiver slide mount with platform flange

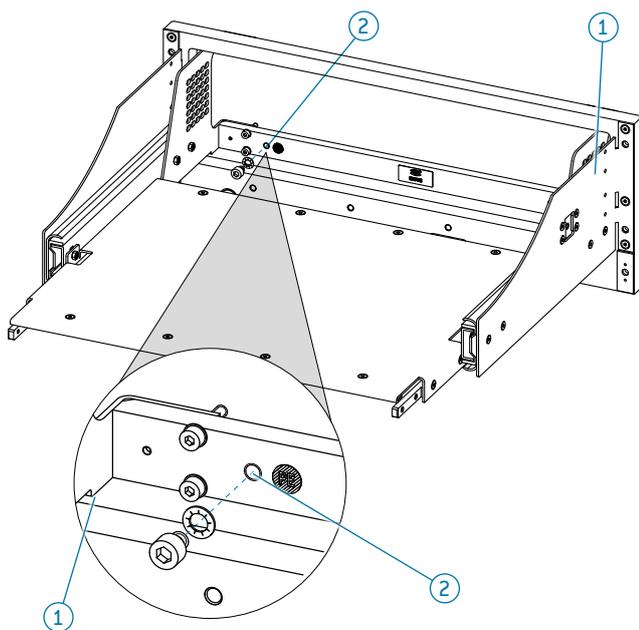


Fig. 156

- On the 12-Flex TWO M Receiver slide mount with platform flange ①, the protective connection is realized via the protective-conductor terminal ②.
- The protective-conductor terminal is located on both sides of the slide mount.
- An M6 thread is provided for the terminal. The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 156.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Slide mount
- ② Protective-conductor terminal

### 7.6.7 Protective-conductor terminal on the 12-Flex TWO M Receiver slide mount without platform flange

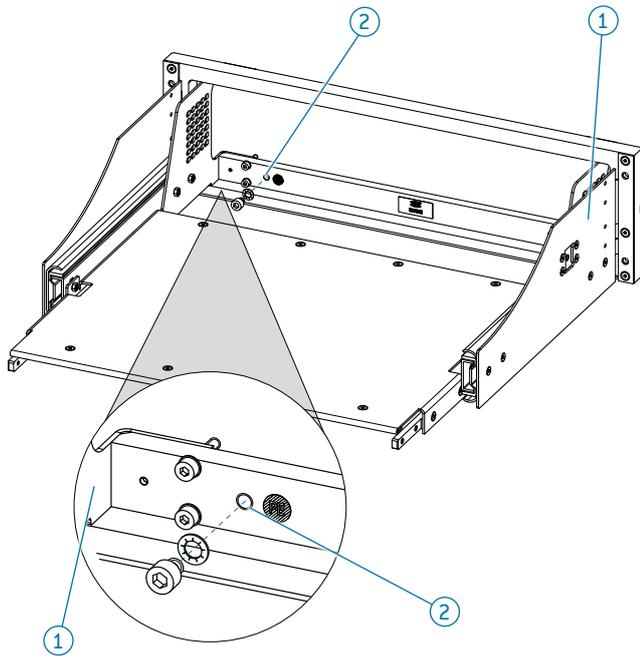


Fig. 157

- On the 12-Flex TWO M Receiver slide mount without platform flange ①, the protective connection is realized via the protective-conductor terminal ②.
- The protective-conductor terminal is located on both sides of the slide mount.
- An M6 thread is provided for the terminal. The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Slide mount
- ② Protective-conductor terminal

### 7.6.8 Protective-conductor terminal 12-Flex FOUR A Receiver fixed mounting frame with platform flange

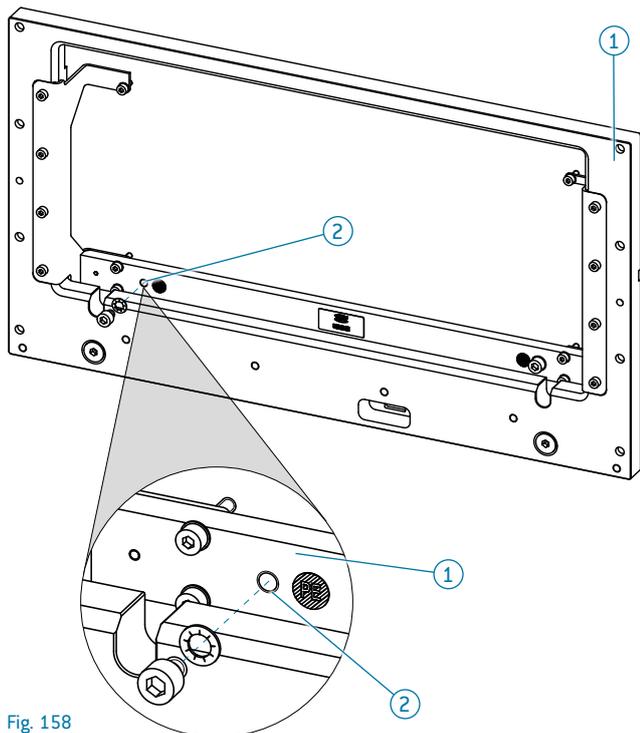


Fig. 158

- On the 12-Flex FOUR A Receiver fixed mounting frame with platform flange ①, the protective connection is realized via the protective-conductor terminal ②.
- The protective-conductor terminal is located on both sides of the fixed mounting frame.
- An M6 thread is provided for the terminal. The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Fixed mounting frame
- ② Protective-conductor terminal

### 7.6.9 Protective-conductor terminal 12-Flex FOUR A Receiver fixed mounting frame without platform flange

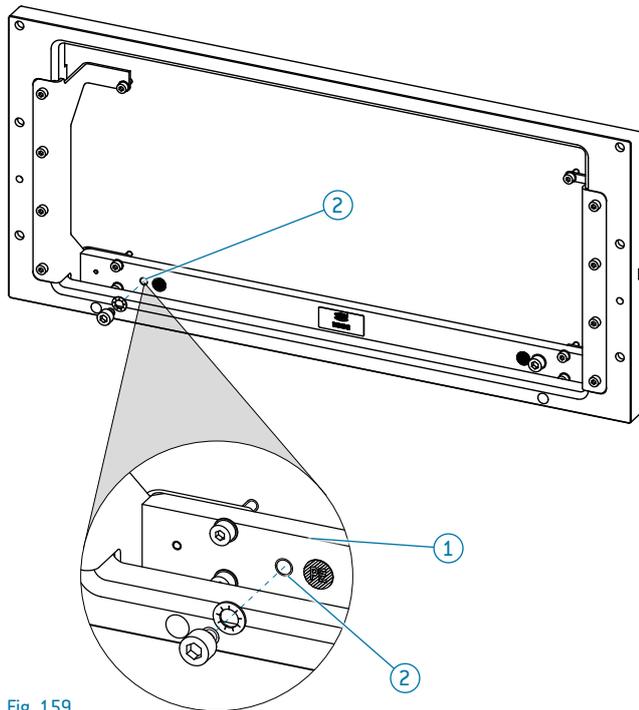


Fig. 159

- On the 12-Flex FOUR A Receiver fixed mounting frame without platform flange ①, the protective connection is realized via the protective-conductor terminal ②.
- The protective-conductor terminal is located on both sides of the fixed mounting frame.
- An M6 thread is provided for the terminal. The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Fixed mounting frame
- ② Protective-conductor terminal

### 7.6.10 Protective-conductor terminal 12-Flex TWO M Receiver fixed mounting frame with platform flange

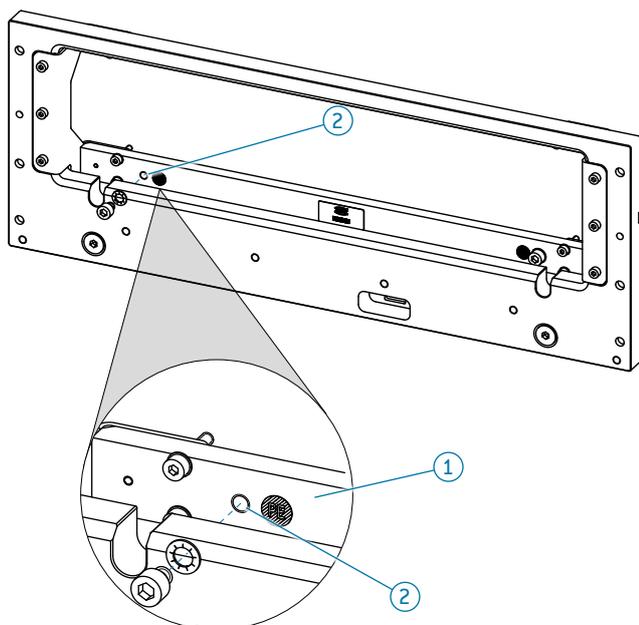


Fig. 160

- On the 12-Flex TWO M Receiver fixed mounting frame with platform flange ①, the protective connection is realized via the protective-conductor terminal ②.
- The protective-conductor terminal is located on both sides of the fixed mounting frame.
- An M6 thread is provided for the terminal. The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Fixed mounting frame
- ② Protective-conductor terminal

### 7.6.11 Protective-conductor terminal 12-Flex TWO M Receiver fixed mounting frame without platform flange

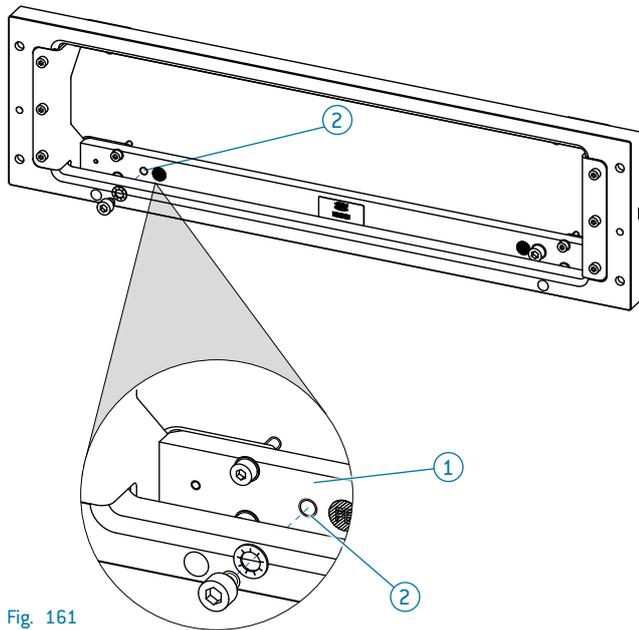


Fig. 161

- On the 12-Flex TWO M receiver fixed mounting frame without platform flange (1), the protective connection is realized via the protective-conductor terminal (2).
- The protective-conductor terminal is located on both sides of the fixed mounting frame.
- An M6 thread is provided for the terminal.  
The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146

#### **i NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Fixed mounting frame
- ② Protective-conductor terminal

## 7.6.12 Protective-conductor terminal on the 12-Flex TWO M Tabletopcover

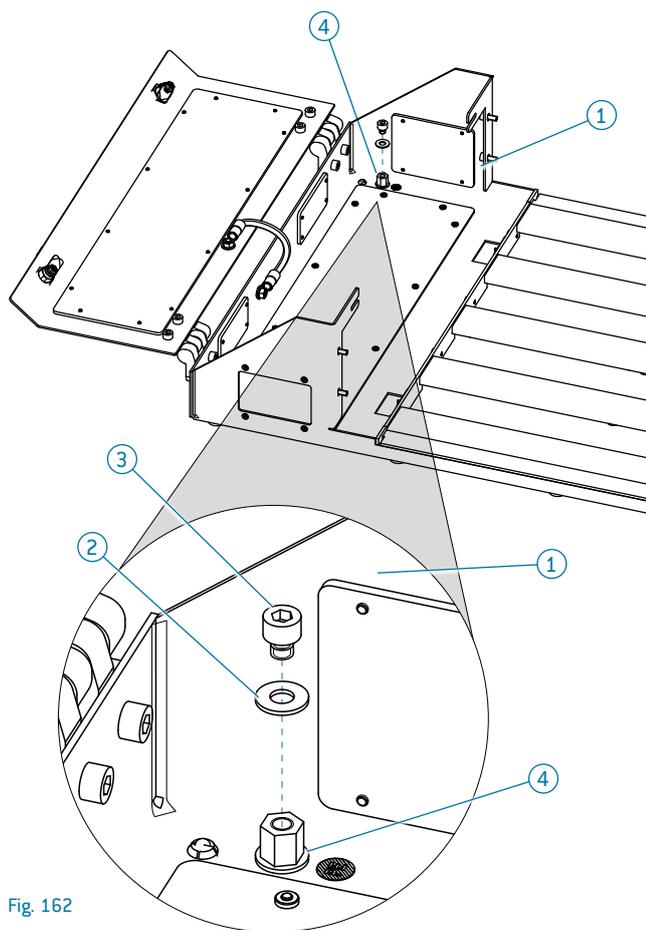


Fig. 162

- On the 12-Flex TWO M Tabletopcover (1), the protective connection is realized via the protective-conductor terminal (4).
- The protective-conductor terminal must be structured as described in [Section 7.6](#), Fig. 145 and 146.

### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Tabletop housing
- ② Contact washer
- ③ Screw
- ④ Protective-conductor terminal

### 7.6.13 Protective-conductor terminal on the ODU-MAC® Black-Line frame

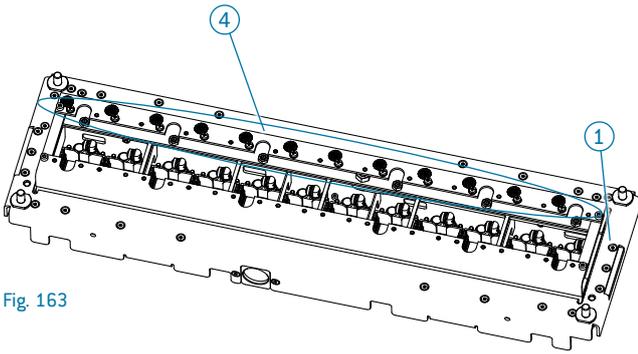


Fig. 163

- On the ODU-MAC® Black-Line frame, the protective connection is realized via the 12 protective-conductor terminals (4) on the adapter (1).
- Every ODU-MAC® Black-Line frame has its own protective-conductor terminal point on the adapter.

#### **i NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#).

- ① Adapter
- ② Contact washer
- ③ Washer
- ④ Protective-conductor terminals
- ⑤ Screw
- ⑥ Protective-conductor connection  
(example, not included in the scope of delivery)

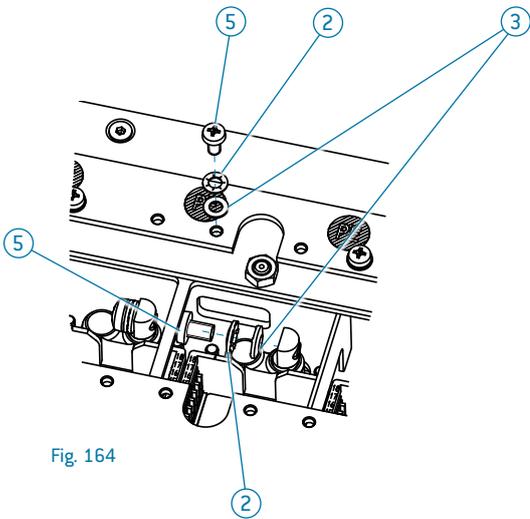


Fig. 164

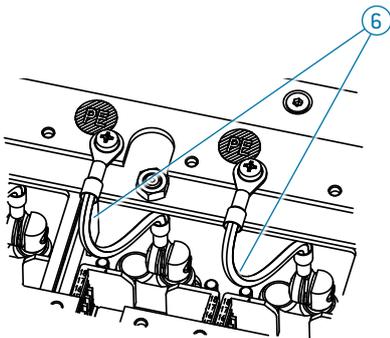


Fig. 165

### 7.6.14 Protective-conductor terminal on the 12-Flex FOUR Enclosure

- The protective conductor is connected to the 12-Flex FOUR enclosure ① via the protective-conductor terminal ②.
- The protective conductor is connected to the flange plates via the protective-conductor terminals ③.
- The protective-conductor terminal must be structured as described in [Section 7.6](#) , Fig. 145 and 146

**NOTICE** Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Table Section 6.17](#) .

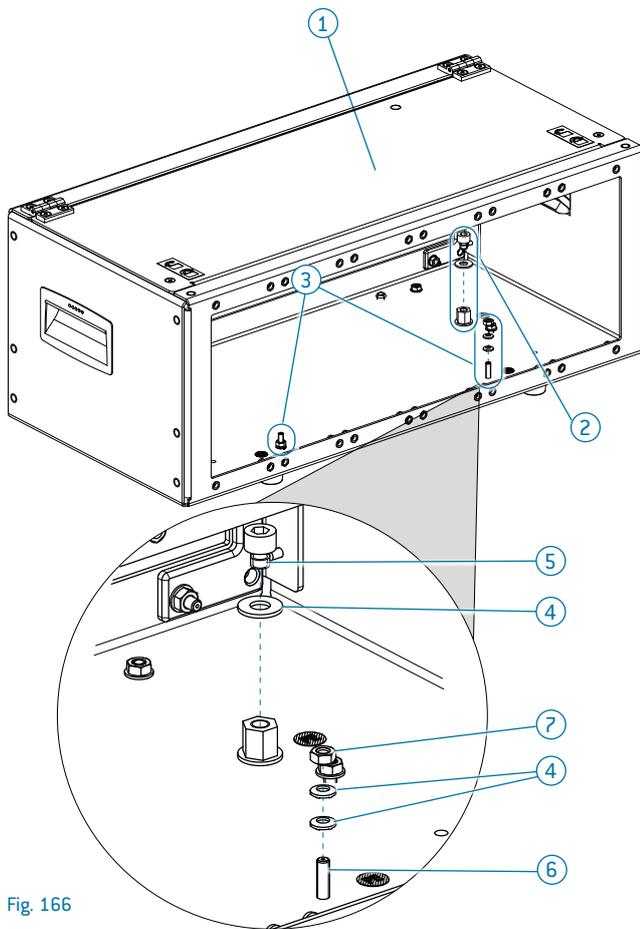


Fig. 166

- ① Enclosure
- ② Protective-conductor terminal for enclosure
- ③ Protective-conductor terminal for flange plates
- ④ Contact washer
- ⑤ Screw
- ⑥ Threaded bolt
- ⑦ Nut



# 8. OPERATION

Read the safety information below before operation and take note of the measures described therein designed to ensure safe operation.

## 8.1 Safety information relating to operation

### DANGER

**Danger from transmitting electric current and producing electric arcs!**

**Touching live connectors can lead to an electric shock.**

**If electric arcs are produced, they can result in injury caused by fire or by molten parts being ejected, and in an electric shock.**

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Only remove and insert connectors when the device is de-energized.
- ▶ Only use connectors according to specifications.
- ▶ Wear personal protective equipment.
- ▶ Use additional protective equipment as appropriate for the work at hand.

### WARNING

**Danger from unattended operation!**

**Injuries can be caused by overheated components, unexpected startup, and fire.**

- ▶ During automatic operation, take additional safety precautions in line with the situation at hand throughout the whole system.
- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.

### ATTENTION

**Danger of adapter falling down if not fully mated.**

**If the adapter is not positioned precisely on the platform or, for the hanging variant, in the receiver, it could fall down.**

- ▶ The adapter must be fully mated in the receiver to ensure the ODU-MAC® Black-Line can be operated safely.
- ▶ Place all the adapter securely on the platform.

### ATTENTION

**Danger from damaged devices and connectors, as well as improper use!**

**Damaged components and improper use can lead to accidents and cause injury.**

- ▶ Never pull on a cable to release a connector.
- ▶ A lack of, or poorly executed, strain relief can damage the contacting.
- ▶ Ensure that contact pins are not bent or otherwise damaged. The connector must no longer be used if damage or other signs of wear are detected.
- ▶ An electric overload or overload from other media can damage the connector.
- ▶ If a foreign object enters the connector or it becomes contaminated, for example by water, you must stop using the connector.
- ▶ Never use the connector or housing as a climbing aid.

## 8.2 Description of functions

### 8.2.1 Condition-monitoring microswitch (optional)

The optional condition-monitoring microswitch can be used to guarantee secure contacting.

These microswitches check that the permissible clearance of 0.5 mm from the ODU-MAC® Blue-Line frame is not exceeded.

### 8.2.2 Resistance coding (optional)

Resistance coding is available as an option and is designed to prevent incompatible adapters (ITA) and receivers being connected.

Resistance coding is realized via a resistance-coding block, which is integrated in the adapter (ITA).

The resistance-coding slot is found in the receiver.

The customer is responsible for ensuring resistance coding is correct and incorporating it into the controller they have provided. For details on contacting release, see [Section 7.5.3](#).

Please contact ODU if you have any questions.

For contact details, see [Section 13](#).

## 8.2.3 Installation space for RFID

### 8.2.3.1 Installation space RFID with IFM ANT515

The adapter (ITA) and the table have dedicated installation space for an RFID system, see section 4.12. RFID system needs to be selected and installed by the customer.

Please contact ODU if you have any questions.

For contact details, see [Section 13](#).

- The IFM read/write head (3) is attached to the holder (2) with 2 screws. These screws are included in the scope of delivery.
- The holder (2) is attached to the flange of the platform (1) with 2 screws. These screws are included in the scope of delivery.

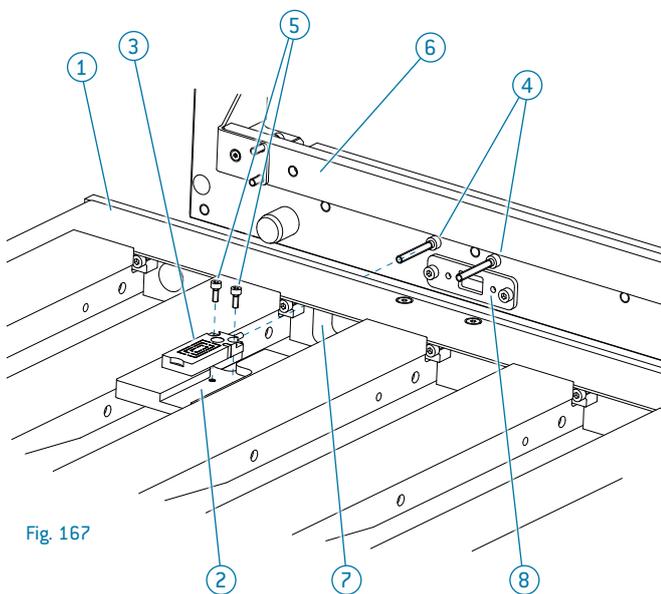


Fig. 167

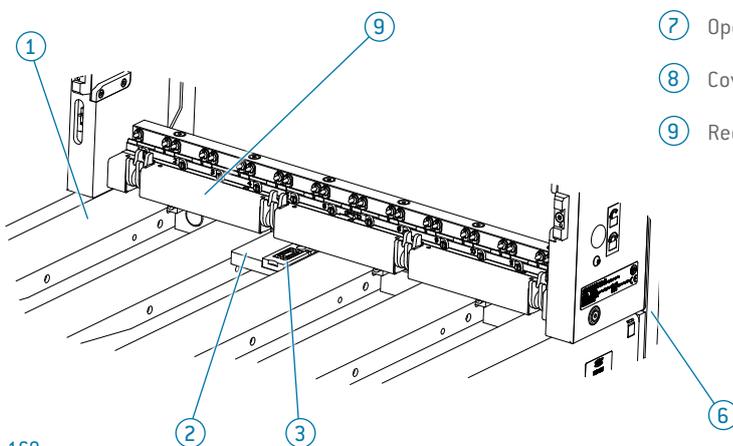


Fig. 168

### Mounting the IFM read/write head with the holder

- ▶ Attach the IFM read/write head (3) to the holder (2) by using the 2 screws (5) (included in the scope of delivery).
- ▶ The connection cable of the IFM read/write head can be routed in the machined groove on the holder (2).
- ▶ Attach the holder (2) with the pre-assembled IFM read/write head to the dismantled platform (1) under the cover on the table flange as shown.
- ▶ Pull the connection cable through the opening on the table flange of the platform (1).
- ▶ Fasten the holder (2) with the screws (4) (included in the scope of delivery).
- ▶ The platform (1) can be mounted on the mounting plate (6).
- ▶ The cover (8) on the mounting plate (6) must be removed. The connection cable can be pulled through here.

#### **NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

#### **NOTICE**

The IFM read/write head is not included in the scope of delivery.

This must be procured independently if needed.

- ① Platform
- ② Holder IFM read/write head
- ③ IFM read/write head
- ④ Screws for holder
- ⑤ Screws for IFM read/write head
- ⑥ Mounting plate
- ⑦ Opening for connection cable of the read/write head
- ⑧ Cover
- ⑨ Receiver

### 8.2.3.2 RFID installation space with Sick RFH515

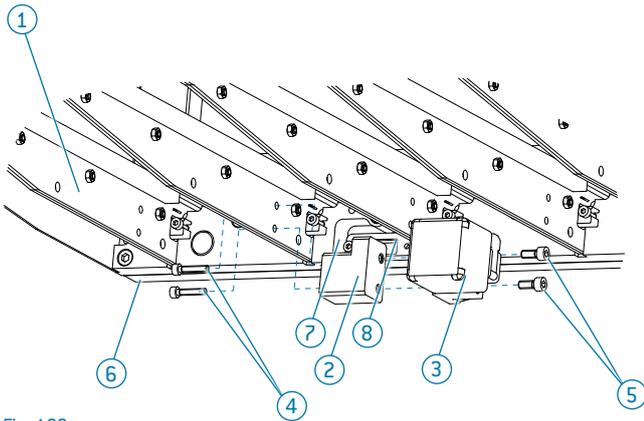


Fig. 169

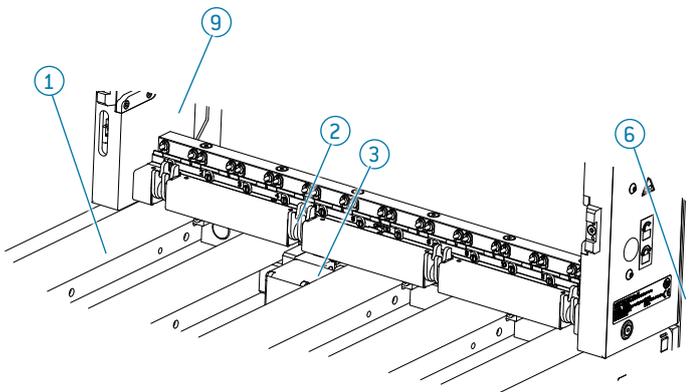


Fig. 170

- The Sick read/write head (3) is attached to the holder (2) with 2 screws. These screws are included in the scope of delivery.
- The holder (2) is attached to the flange of platform (1) with 2 screws. These screws are included in the scope of delivery.

#### Mounting the Sick read/write head with the holder

- ▶ Attach the Sick read/write head (3) to the holder (2) by using the 2 screws (5) (included in the scope of delivery).
- ▶ Attach the holder (2) with the pre-assembled Sick read/write head to the dismantled platform (1) under the cover on the table flange as shown.
- ▶ Pull the connection cable through the opening (7) on the table flange of the platform (1).
- ▶ Fasten the holder (2) with the screws (4) (included in the scope of delivery).
- ▶ The platform (1) can then be mounted on the mounting plate (6).
- ▶ The cover (8) on the mounting plate (6) must be removed. The connection cable can be pulled through here.

#### **i NOTICE**

Take note of the specified tightening torques and numbers of screws!

Always tighten screws and nuts to the specified tightening torques.

For details of screws, nuts, and tightening torques, see [Section 6.16](#).

#### **i NOTICE**

The Sick read/write head is not included in the scope of delivery.

This must be procured independently if needed.

- ① Platform
- ② Holder Sick read/write head
- ③ Sick read/write head
- ④ Screws for holder
- ⑤ Screws for Sick read/write head
- ⑥ Mounting plate
- ⑦ Opening for connection cable of the read/write head
- ⑧ Cover
- ⑨ Receiver

### 8.2.3.3 RFID installation space with Turck TW-R20-B128

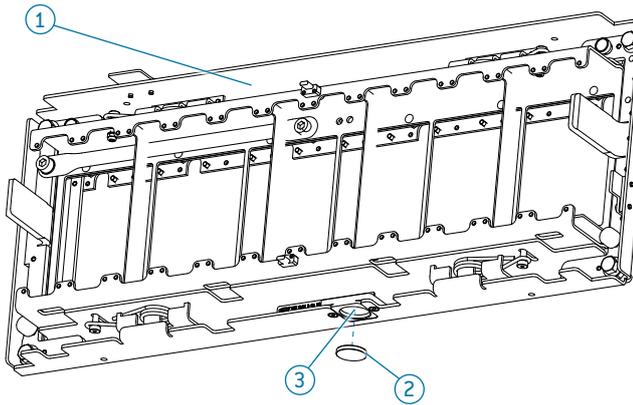


Fig. 171

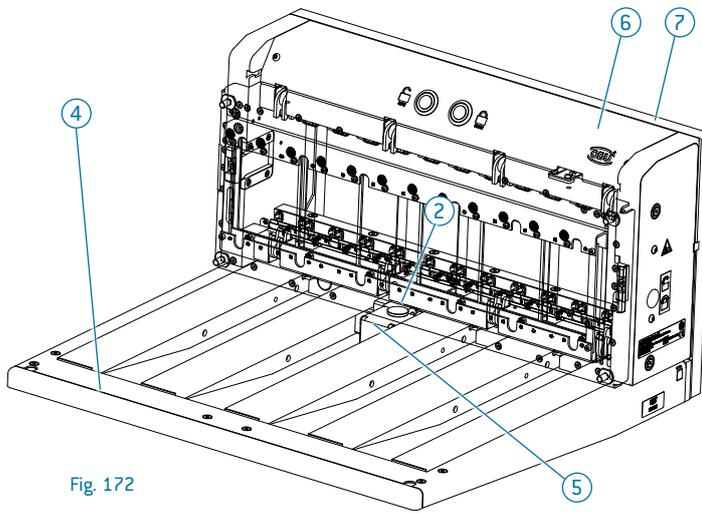


Fig. 172

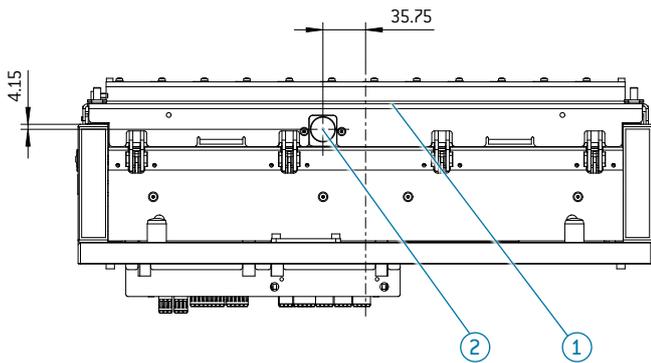


Fig. 173

- The RFID TAG (2) from Turck can be pressed or/and glued into the holder (3).

#### Mounting the RFID TAG on the holder

#### **i NOTICE**

No read/write heads and RFID TAGS are included in our scope of delivery

Our mounting sets for the holders only work for the specified read/write heads and data carriers.

- ① Adapter
- ② Turck RFID TAG
- ③ RFID TAG holder
- ④ Platform
- ⑤ Sick read/write head
- ⑥ Receiver
- ⑦ Mounting plate

- If the system is operated with a customer platform and any other RFID read/write head, the necessary dimensions for the intended installation position of data carrier (2) in adapter (1) are shown in Fig 173.

## 8.3 Locking of receiver onto the slide mount

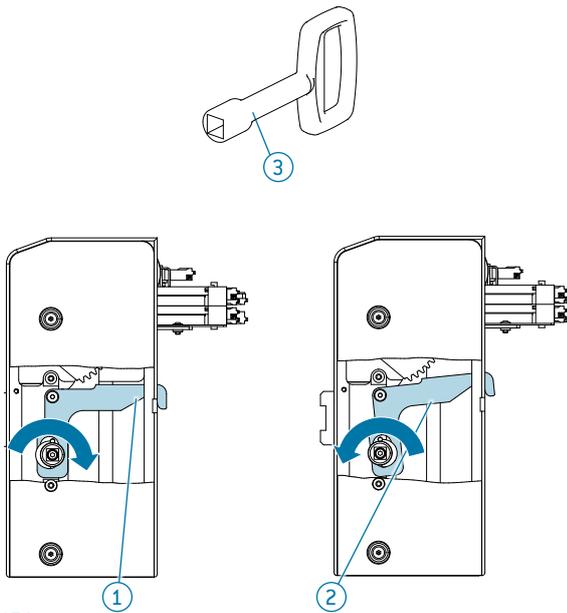


Fig. 174

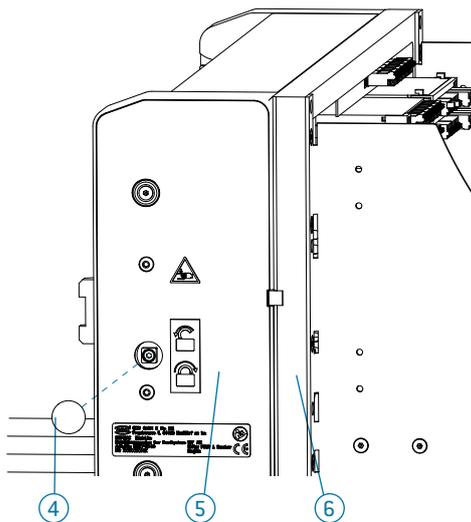


Fig. 175

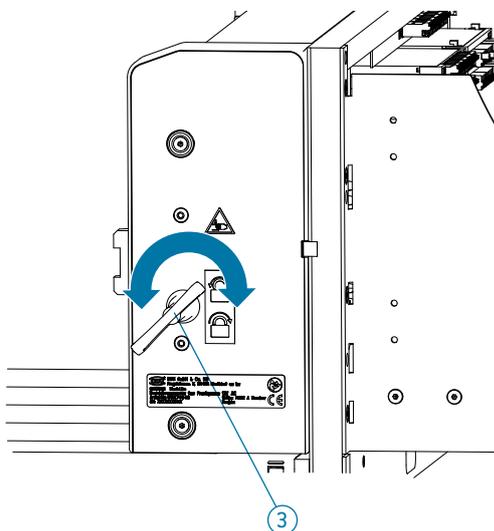


Fig. 176

To unlock and lock the receiver, you will need:

- Socket wrench for lock (3) [Part number 098.637.000.000.002].
- When closing (1) and opening (2), the locking hook only rises just enough to release the lock.
- Locking follows the same principle on all slide mounts. The example shows unlocking and locking of a 12-Flex FOUR A receiver on the 12-Flex FOUR receiver slide mount with platform flange.

### **i NOTICE**

The receiver must be unlocked or locked on both side panels (left and right)!

#### Opening the receiver on the slide mount

- ▶ Remove the cover cap (4) from the side panels.
- ▶ Open the locking hook. To open, turn the socket wrench (3) counterclockwise as far as it will go (2). Repeat the procedure as a mirror image on the other side.
- ▶ Pull the receiver (5) out by the side panels as far as it will go. Service access is now open and the modules are accessible from the rear.

#### Closing the receiver on the slide mount

- ▶ Push the receiver (5) by the side panels onto the slide mount (6).
- ▶ Close the locking hook. To close, turn the socket wrench (3) clockwise as far as it will go (1). Repeat the procedure as a mirror image on the other side.
- ▶ Attach the cover cap (4) onto the side panels.

- (1) Closed locking hook
- (2) Open locking hook
- (3) Socket wrench for lock
- (4) Cover cap
- (5) Receiver
- (6) Slide mount

## 8.4 Operation of 12-Flex FOUR A Receiver

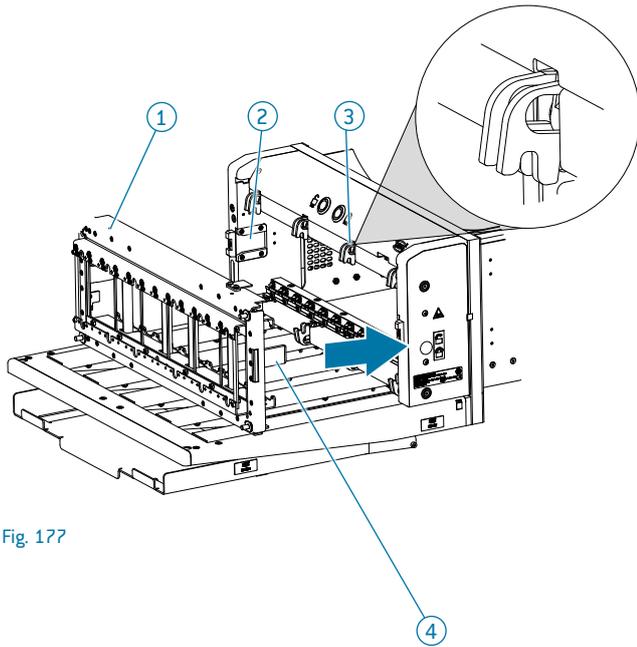


Fig. 177

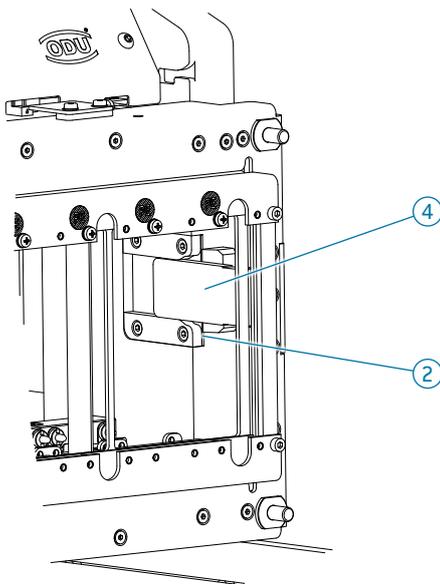


Fig. 178

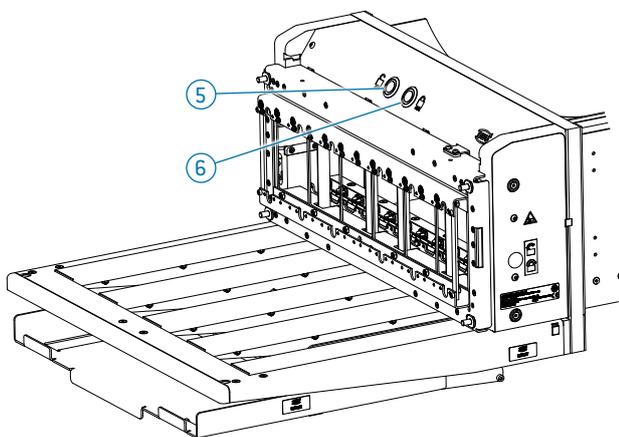


Fig. 179

- On electric receivers, locking and unlocking is done via buttons in inching mode.

### Opening the locking hook

- Press the Unlock button (5) to open the locking hook (3). The locking hooks are open when delivered.

### Attaching the adapter (ITA)

- Attach the adapter (ITA) (1) so the centering blades (4) are aligned with the centering blade holders (2).
- Guide the adapter (ITA) (1) toward the receiver so the centering blades (4) slide into the centering blade holders (2) on both sides. Make sure the adapter (ITA) (1) does not tilt during this process.
- Push the adapter (ITA) (1) onto the receiver as far as it will go. The release then follows automatically. The Lock button (6) lights up continuously.
- Please ensure that the adapter reaches the end position on both sides at the same time.

### Locking the adapter (ITA) and receiver

- Press the Lock (Close) button (6) and hold it down until the limit position is reached.
- The locking hooks (3) tighten and contacting takes place. The procedure is complete as soon as the Unlock button (5) lights up continuously.

### Unlocking the adapter (ITA) from the receiver

- Press the Unlock (Open) button (5) and hold it down until the limit position is reached. The locking hooks (3) are released. The procedure is complete when the Lock (Close) button (6) lights up continuously.

### Pulling the adapter (ITA) away

- Carefully pull the adapter (ITA) (1) away from the receiver. Do not tilt the adapter (ITA) (1) during this process. Make sure not to damage the assembled connectors when pulling the adapter (ITA) (1) away.

- ① Adapter (ITA)
- ② Centering blade holder
- ③ Open locking hook
- ④ Centering blade
- ⑤ Unlock (Open) button
- ⑥ Lock (Close) button

## 8.5 Operation of 12-Flex TWO M Receiver and 12-Flex TWO M Tabletop receiver

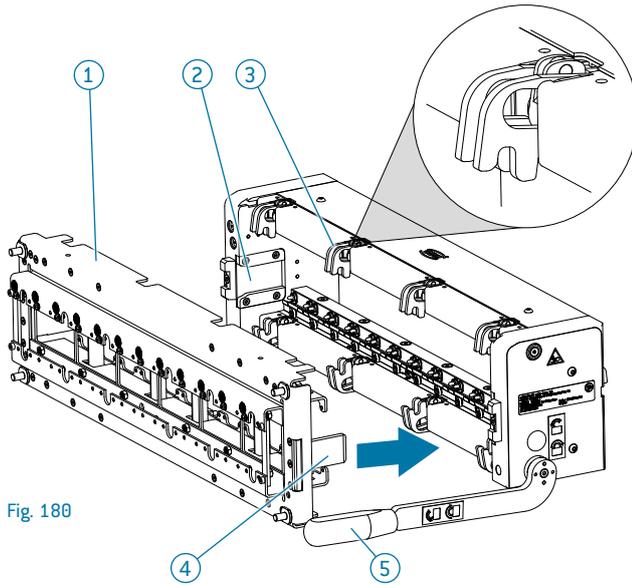


Fig. 180

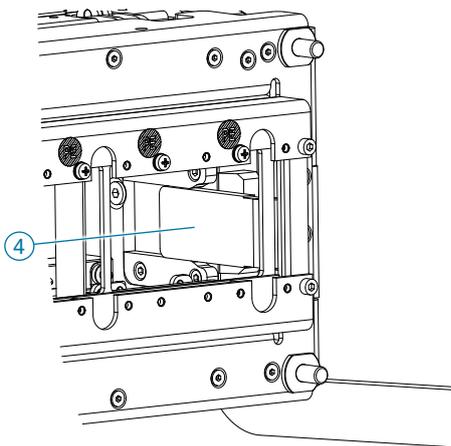


Fig. 181

- On mechanical receivers, locking and unlocking is done via a hand lever (5).

### Opening the locking hook

- Turn the hand lever (5) counterclockwise.

### Attaching the adapter (ITA)

- Attach the adapter (ITA) (1) so the centering blades (4) are aligned with the centering blade holders (2).
- Guide the adapter (ITA) (1) toward the receiver so the centering blades (4) slide into the centering blade holders (2) on both sides. Make sure the adapter (ITA) (1) does not tilt during this process.
- Push the adapter (ITA) (1) onto the receiver as far as it will go.

### Locking the adapter (ITA) and receiver

- Close the locking hooks (3) with the hand lever (5). Do this by turning the hand lever (5) clockwise as far as it will go.
- The locking hooks (3) tighten and contacting takes place.

### Unlocking the adapter (ITA) from the receiver

- Turn the hand lever (5) counterclockwise as far as it will go. The locking hooks are released.
- Carefully pull the adapter (ITA) (1) away from the receiver. Do not tilt the adapter (ITA) (1) during this process. Make sure not to damage the assembled connectors when pulling the adapter (ITA) (1) away.

- (1) Adapter (ITA)
- (2) Centering blade holder
- (3) Open locking hook
- (4) Centering blade
- (5) Hand lever in bottom position for opening

## 8.6 Installation of covers onto the receiver and adapter (ITA)

### 8.6.1 Use of the cover on the receiver

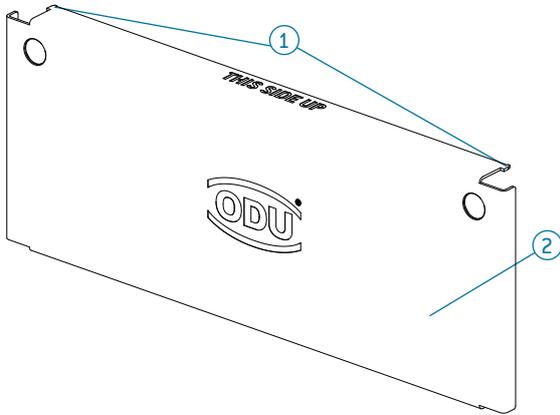


Fig. 182

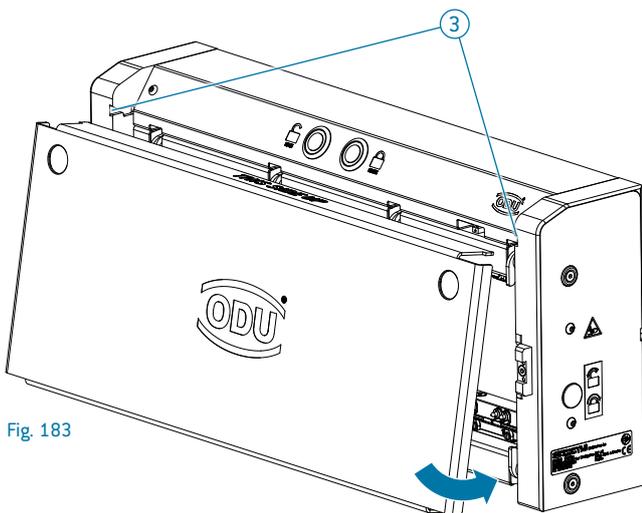


Fig. 183

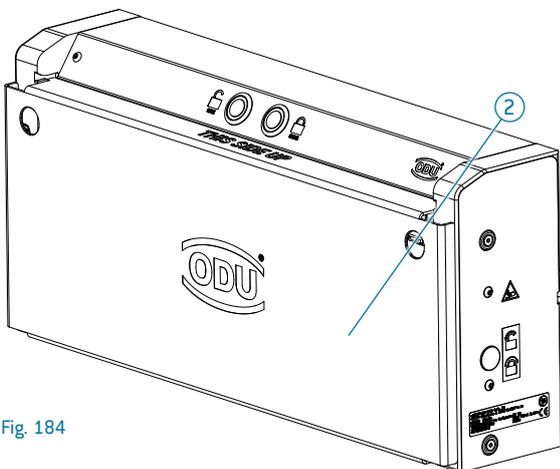


Fig. 184

- The receiver cover (2) hooks into the retaining grooves (3) at the top of the receiver.
- The cover hooks in in exactly the same way for all 12-Flex TWO M receivers and 12-Flex FOUR A receivers.
- The example shows the hooking in of the cover on a 12-Flex FOUR A receiver.

#### ATTENTION

**Risk of damage from the receiver being open.**

- ▶ When not in use, protect the receiver with the receiver cover.

#### Assembling the cover on the receiver

- ▶ Guide the locating lugs on the receiver cover (1) into the retaining grooves on the receiver (3).
- ▶ Pivot the receiver cover (2) down until it makes contact with the receiver.

- ① Locating lugs on the receiver cover
- ② Receiver cover
- ③ Retaining grooves on the receiver

## 8.6.2 Use of the cover on the adapter (ITA)

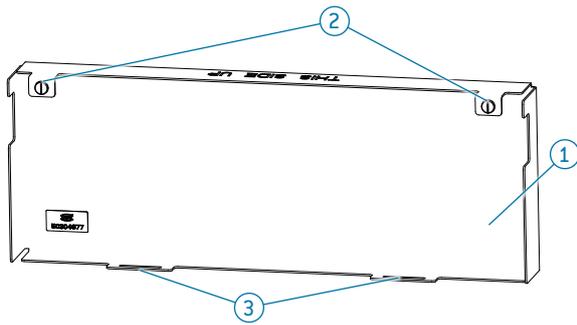


Fig. 185

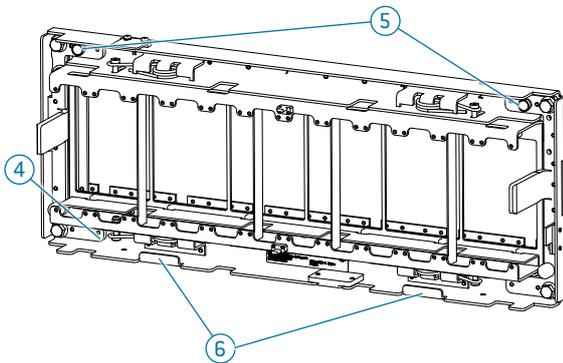


Fig. 186

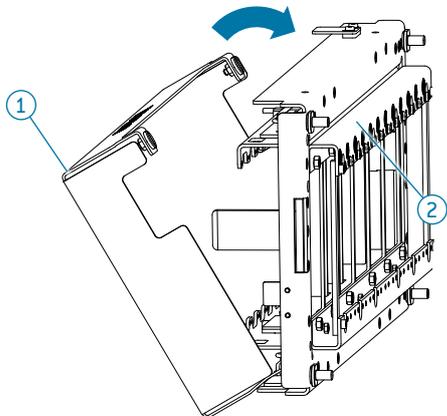


Fig. 187

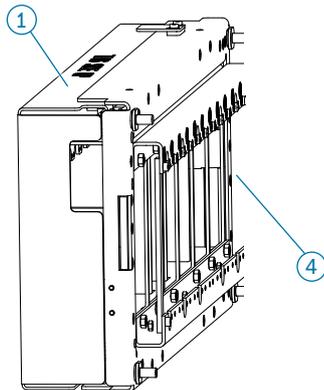


Fig. 188

- The adapter cover (1) needs to be attached to the mounting brackets (6) at the bottom of adapter (4) and held at the top of adapter (2) by the means of 2 magnets (5).
- Inserting the cover (1) is identical for all 12-Flex TWO M adapters and 12-Flex FOUR A adapters.
- The example shows the use of the cover for 12-Flex FOUR A adapters (4).

### ATTENTION

**Risk of damage from the adapter (ITA) being open.**

- ▶ When not in use, protect the adapter (ITA) with the adapter cover.

### Assembling the cover on the adapter (ITA)

- ▶ Insert the slotted holes (3) of the adapter cover (1) into the mounting brackets (6) of the adapter (ITA) (4).
- ▶ Fold the adapter cover 1 towards the adapter (ITA) (4) until the adapter cover (1) is automatically attracted by the magnets (5) on the adapter (ITA) (4).

- ① Adapter cover
- ② Magnetic holding heads
- ③ Slotted hole holder
- ④ Adapters (ITA)
- ⑤ Magnets
- ⑥ Mounting bracket



# 9. MAINTENANCE

Read the safety information and other notes below before carrying out any maintenance or cleaning work and take note of the measures described therein designed to ensure safe maintenance and cleaning.

## 9.1 Safety information relating to maintenance

**⚠ DANGER** Danger from electric current!

Touching live parts can lead to an electric shock.

- ▶ Always have maintenance and cleaning work carried out by qualified skilled personnel (maintenance personnel or technicians).
- ▶ De-energize the combined device before working on the contact system.
- ▶ Use a padlock to secure the main switch for the whole system against unauthorized restarting.
- ▶ Wear personal protective equipment.
- ▶ Use additional protective equipment as appropriate for the work at hand.
- ▶ Only remove and insert connectors when the device is de-energized.

**⚠ WARNING** Danger from improper maintenance!

Incorrect or improperly conducted maintenance can leave the combined device in a potentially dangerous condition. This then leads to the risk of injury, up to and including electric shock.

- ▶ Only ever allow skilled personnel to perform assembly, installation, commissioning, repair, maintenance, and servicing work.
- ▶ Only ever allow appropriately skilled personnel to work on electrical equipment!
- ▶ Only allow authorized personnel to perform diagnostics, troubleshooting, and recommissioning.
- ▶ Follow the applicable safety rules.
- ▶ Wear personal protective equipment.
- ▶ Only use genuine spare parts.

**⚠ CAUTION** Risk of injury from sharp edges and corners!

Sharp edges and corners can cause abrasions and cuts.

- ▶ Be careful when working near to sharp edges and corners.
- ▶ Wear personal protective equipment.

**i NOTICE**

Maintain and clean the device according to the maintenance table.

The maintenance and cleaning intervals may be longer than stated in the maintenance table, depending on the environmental conditions.

## 9.2 Information on cleaning

**ATTENTION** Risk of damage from unsuitable cleaning!

- ▶ Never clean the device with compressed air.

Only clean the accessible surfaces and covers of the device.

- ▶ Clean the device with a lint-free cloth.
- ▶ To remove more stubborn dirt, wipe the device with a damp, lint-free cloth.
- ▶ Make sure that no moisture is able to enter the device.

## 9.3 Lubrication

- ▶ Lubricate the locking mechanism ① of the locking hooks ② regularly according to the maintenance table. Make sure the lubricant is only applied to the locking mechanism.

A recommended lubricant is included in the Service Kit, Part number 170.000.000.000.100.

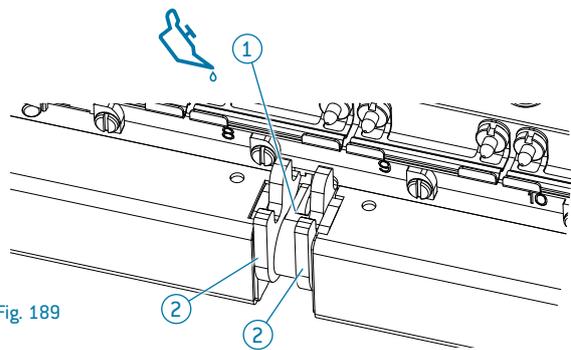


Fig. 189

- ① Locking mechanism
- ② Locking hook

## 9.4 Maintenance table

Interval	Location	Action
Daily	Whole system	Visual check of loose receptacles
Every 5,000 mating cycles	Locking mechanism	Lubricate
Every 5,000 mating cycles	Centering blade holder	Clean
Every 5,000 mating cycles	Whole system	Clean

## 9.5 List of accessories

Accessory	Part number
Width across flats 8 socket wrench for emergency release	098.637.000.000.001
Socket wrench for service access lock	098.637.000.000.002
Flex TWO receiver strain-relief plate	637.050.200.000.001
Flex FOUR receiver strain-relief plate	637.050.400.000.002
Flex FOUR adapter strain-relief plate	638.050.400.000.003
Flex TWO adapter strain-relief plate	638.050.200.000.004
12-Flex FOUR receiver protective cover	637.060.412.000.001
12-Flex TWO receiver protective cover	637.060.212.000.001
12-Flex FOUR adapter protective cover	638.060.412.000.002
12-Flex TWO adapter protective cover	638.060.212.000.002
Cover for 12-Flex FOUR receiver slot	637.154.000.921.001
Cover for 12-Flex TWO receiver slot	637.152.000.921.001
Cover for 12-Flex FOUR A adapter slot	638.154.000.921.001
Cover for 12-Flex TWO M adapter slot	638.152.000.921.001
Adapter alignment system for platform	638.050.000.000.003
Service Kit	170.000.000.000.100
Receiver hand lever extension 100 mm	637.052.000.000.001
Receiver hand lever extension 30 mm	637.052.000.000.002
RFID Sick read / write head set	638.050.000.000.007
RFID IFM read/write head set	638.050.000.000.007
Resistance coding set adapter	638.050.000.000.001

# 10. TROUBLESHOOTING

Read the safety information below before performing troubleshooting or repairs and take note of the measures described therein designed to ensure safe troubleshooting and repairs.

**⚠ WARNING** **Danger from improper troubleshooting!**

- ▶ Always have troubleshooting carried out by qualified skilled personnel (maintenance personnel or technicians).
- ▶ Only unlock the receiver with the special tool described.
- ▶ Only use genuine spare parts.

**i NOTICE**

The possible faults listed in the troubleshooting matrix are based on the standard of knowledge available when these assembly instructions were produced.

The latest findings and experience will be incorporated and added to these possible faults as part of a process of continuous improvement.

## 10.1 Troubleshooting matrix

Possible fault	Possible cause	Action
Adapter (ITA) will not hook in to receiver	Locking mechanism stiff	Lubricate according to maintenance schedule
	Centering blades bent	Replace centering blades
	Foreign object in contact or hook-in area	Remove foreign object
Adapter (ITA) will not unhook from receiver	Receiver is locked	Unlock receiver
	Locking mechanism stiff	Open receiver via emergency release and lubricate according to maintenance schedule
Will not lock	Light barriers not switching	Check light barriers and replace if necessary
	ITA not in correct position	Check ITA position
	No power supply	Check power supply
	Button not switching	Check button and replace if necessary
	Controller fault	Interrupt power supply (reset)
	Locking mechanism stiff	Lubricate receiver according to maintenance schedule
Will not unlock	Light barriers not switching	Check light barriers and replace if necessary
	Locking mechanism stiff	Open receiver via emergency release and lubricate according to maintenance schedule
	No power supply	Check power supply
	Button not switching	Check button and replace if necessary
	Controller fault	Interrupt power supply (reset)
Controller fault (buttons flashing simultaneously)	Controller fault	Interrupt power supply (reset)
	Faulty signal from light barrier	Check electric components
	Faulty signal from button	Check electric components
	Faulty signal from fork light barrier	Contact service department
Slide mount jamming	Service access lock not open on both sides	Check service access lock and open fully on both sides
	Slide mount bent	Replace slide mount
	Lock not actuated	Actuate lock, check function if necessary
	Keyboard-tray rail bent	Replace keyboard tray



## 10.2 Opening of the 12-Flex FOUR A Receiver via emergency release

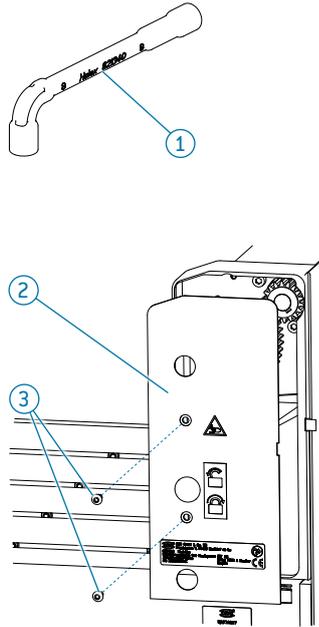


Fig. 190

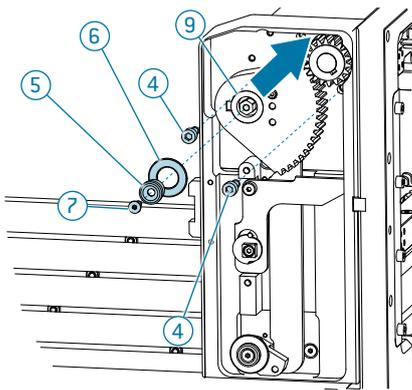


Fig. 191

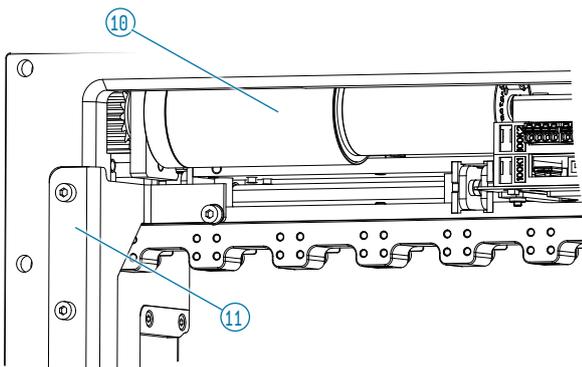


Fig. 192

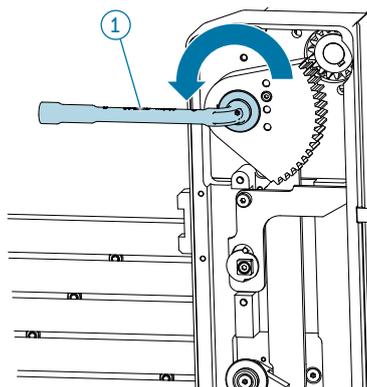


Fig. 193

**⚠ DANGER** Danger from transmitting electric current!

Touching live connectors can lead to an electric shock.

- ▶ Only allow skilled personnel to open the receiver via the emergency release.
- ▶ Only ever open the receiver via the emergency release when the device is de-energized.
- ▶ Secure the device against restarting.

To undo the cover fixing screws (3), you will need:

- Hexagon wrench width across flats 2.5 mm

To undo the emergency-release screw (7), you will need:

- Hexagon wrench for hexagon socket width across flats 2.5 mm

To actuate the locking shaft (9), you will need:

Socket wrench width across flats 8 for emergency release (1) [Articel-Nr. 098.637.000.000.001]. The emergency-release screw is at the top of the receiver's right side panel.

### Opening the receiver via emergency release

- ▶ Remove the fixing screws from the cover (3) (hexagon socket width across flats 2.5).
- ▶ Remove the cover from the side panel (2).
- ▶ Remove the fixing screws (4) from the motor and push the motor back until the gears are no longer meshed.\*
- ▶ Ensure that the electrical contacts of the motor do not touch the control unit when pulling out the motor.
- ▶ Remove the cover (5) and the washer (6) together with the screw (7) (hexagon socket width across flats 2.5).
- ▶ Place the socket wrench width across flats 8 (1) onto the now-exposed hexagon socket of the locking shaft (9).
- ▶ To unlock the receiver, turn the socket wrench counterclockwise until the system (8) is unlocked completely, see bottom figure.
- ▶ After removing the adapter (ITA), move the socket wrench width across flats 8 (1) back to the home position and reassemble everything by following the steps in reverse order [Fig. 191].
- ▶ When assembling the motor, make sure the gears mesh with one another.

\*With older versions, the receiver must be completely removed from the mounting plate or the telescopic pull-out in order to slide the motor out to the rear. [see Fig. 195]

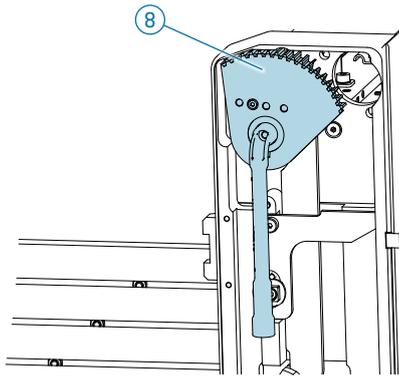


Fig. 194

- ① Socket wrench width across flats 8
- ② Cover for right side panel
- ③ Cover fixing screws (hexagon socket width across flats 2.5)
- ④ Motor fixing screws
- ⑤ Cover for emergency-release screw (hexagon socket width across flats 2.5)
- ⑥ Washer
- ⑦ Screw
- ⑧ System
- ⑨ Locking shaft
- ⑩ Motor
- ⑪ Mounting frame
- ⑫ Controller

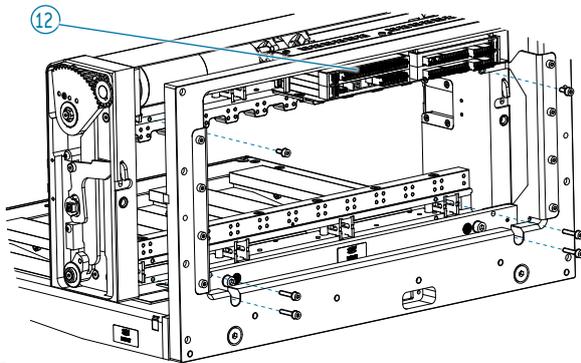


Fig. 195

For customer-specific receivers, it must be ensured that the required areas for emergency unlocking are easily accessible, otherwise it will not be possible to open the receiver in the event of a defect in the electromechanical locking system.

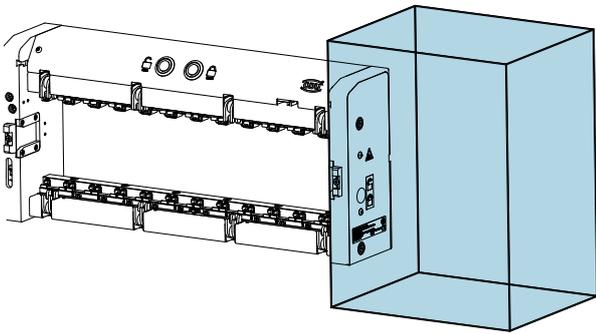


Fig. 196

**ATTENTION** If the emergency release cannot be reached; there is a potential hazard as it will not be possible to disconnect the adapter from the receiver in case of a defect!

► In order to actuate the emergency release, it is necessary to ensure during the design phase that there is a freely accessible area on the side of the receiver. [Fig.196]

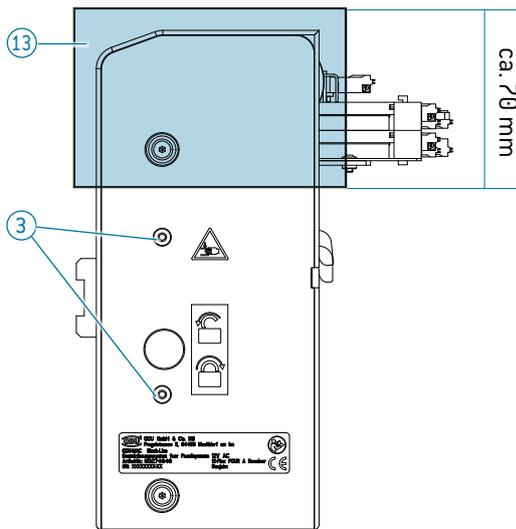


Fig. 197

► If this is not possible, it must at least be ensured that the screws ① on the cover and the marked area ⑬ are accessible. [Fig.197]

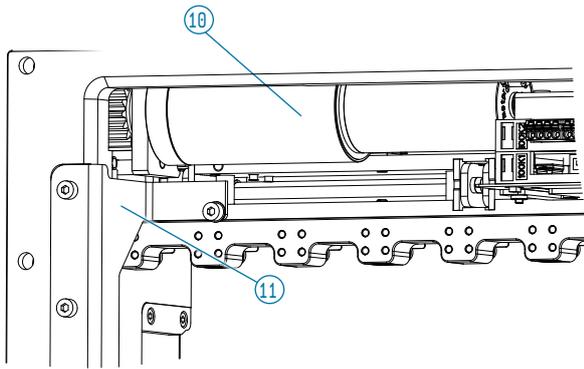


Fig. 198

**NOTICE**

Take note of the specified tightening torques and numbers of screws!  
For details of screws, nuts, and tightening torques, see [Section 6.16](#).

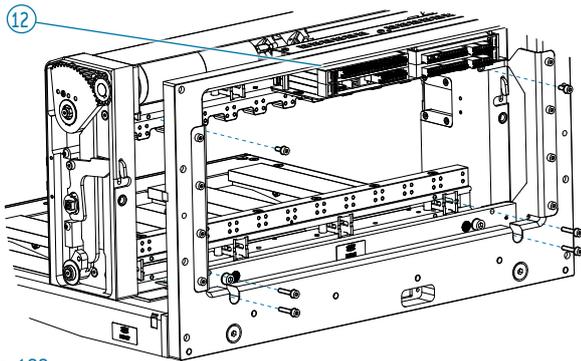


Fig. 199

- With older versions, the receiver must be completely removed from the mounting plate or the telescopic pull-out in order to slide the motor out to the rear.

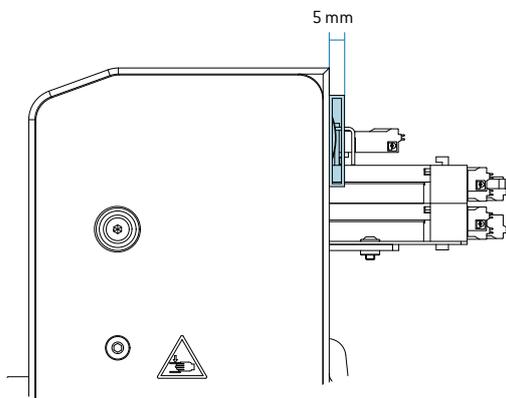


Fig. 200

- For mounting the receiver on a customer mounting plate, the spaces marked in Figures 200 and 201 must not be installed.

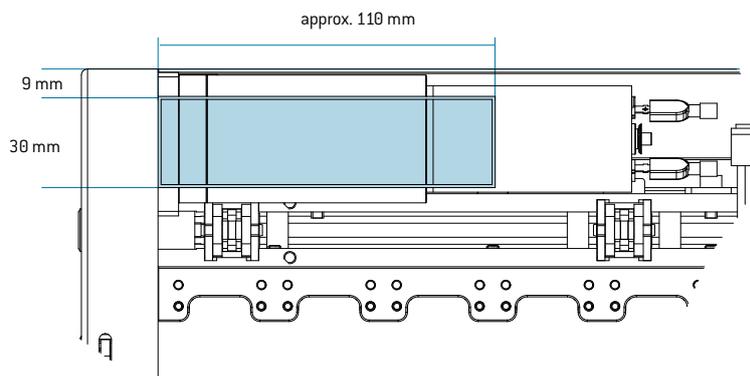


Fig. 201

# 11. DECLARATION OF INCORPORATION

Declaration of conformity with the required content in accordance with EN ISO/IEC 17050-1



A PERFECT ALLIANCE.

## Original Declaration of Incorporation

in accordance with the Machinery Directive for partly completed machinery

Document No./Month Year: D00010598 / June . 2020

For the partly completed machinery described below

**Role:** Contact system for testing systems for installation in stationary testing systems

**Description, Article No.:** ODU-MAC Black-Line; 12-Flex FOUR A Receiver; Art. No. 50274947, 50274948, 50274949, 50274950

We hereby declare that these products comply with the essential requirements described below for partly completed machinery in accordance with the Machinery Directive 2006/42/EC:

1.1.3, 1.1.5, 1.1.6, 1.2.1, 1.2.2, 1.2.3, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.9, 1.4.1, 1.5.1, 1.5.2, 1.5.5, 1.5.6, 1.5.7, 1.5.8, 1.5.9, 1.5.10, 1.5.11, 1.6.1, 1.6.2, 1.6.4, 1.6.5, 1.7.1, 1.7.3, 1.7.4

The specific technical documentation referred to in Annex VII, Part B has been created.

Upon substantiated request, we shall provide the national authorities with the specific documentation concerning the partly completed machinery in electronic or paper form.

The partly completed machinery must not be put into service until it has been established that the machine into which the partly completed machinery is to be incorporated complies with the provisions of the Machinery Directive and, where appropriate, any other applicable requirements.

Details of the relevant **standards/technical specifications** used as a basis (if applicable to the partly completed machinery):

EN ISO 12100:2010, EN ISO 13849-1:2015, EN 60204-1:2006 + A1\_2009

The manufacturer bears sole responsibility for issuing this declaration of incorporation.

**Name:** ODU GmbH & Co. KG  
**Address:** Pregelstrasse 11, 84453 Mühldorf am Inn, Germany

The following person/entity is authorized to compile the relevant technical documentation:

**Name:** Otto Dunkel GmbH  
**Address:** Pregelstrasse 11, 84453 Mühldorf am Inn, Germany

Mühldorf am Inn / 26.06.2020 

Area / Date Dipl. Ing. (FH) Stefan Franzl, Segment Manager KB-MDS

Mühldorf am Inn / 26.06.2020 

Area / Date Dr.-Ing. Kurt Woelfl, Technical Manager

This declaration certifies conformity with the so-called harmonization legislation, but does not include any assurance of product characteristics or features.

### Additional information

This declaration applies to all specimens manufactured in accordance with the corresponding manufacturing drawings, which are part of the technical documentation. Further information regarding compliance with the above sources is contained in the supporting documentation enclosed with the conformity statement.



# EU Declaration of Conformity

A PERFECT ALLIANCE.

Document No./Month Year: D00010597 / June . 2020

For the product described below

**Description, Article No.:** ODU-MAC Black-Line  
12-Flex FOUR A Receiver  
Art No.: 50274947, 50274948, 50274949, 50274950

We hereby declare that this product meets the **essential requirements** laid down in the harmonization legislation referred to below:

Directive 2014/30/EU of the European Parliament and of the Council of February 26, 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility – in short: **EMC Directive**

Directive 2011/65/EU of the European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment – in short: **RoHS Directive**

Details of the relevant **harmonized standards/technical specifications** used as a basis:

### Harmonized standards

Source	Issue date	Job title
EN 61000-6-2	2005	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-4 + A1	2007, 2011	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emitted interference for industrial environments
EN 50581	2012	Technical documentation for the assessment of electrical and electronic equipment regarding the restriction of hazardous substances

The manufacturer or its authorized representative bears responsibility for issuing this declaration.

**Name:** ODU GmbH & Co. KG  
**Address:** Pregelstrasse 11, 84453 Mühldorf am Inn, Germany

Mühldorf am Inn / 26.06.2020 

Area / Date Dipl. Ing. (FH) Stefan Franzl, Segment Manager KB/MDS

Mühldorf am Inn / 26.06.2020 

Area / Date Dr.-Ing. Kurt Woelfl, Technical Manager

This declaration certifies conformity with the so-called harmonization legislation, but does not include any assurance of product characteristics or features.

### Additional information

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## 12. DISASSEMBLY / DISPOSAL



Do not dispose of old electrical and electronic devices in domestic waste.

When disposing of the device, equipment, and accessories, follow the latest relevant environmental and recycling regulations applicable in your country and region.

# 13. SERVICE / SUPPORT

**Direct any questions to:**

**Customer Service**

ODU GMBH & CO. KG

Pregelstraße 11

84453 Mühldorf a. Inn

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ODU-MAC® Black-Line operating and assembly instructions / TI / 0425 / EN

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