

Installation Instructions

Kit 2DS Ex-i module for CM44x(R) / CM44P

Replacement / repair of the 2DS Ex-i module for
CM44x(R) / CM44P



1 Overview of spare part set

Order number	Original spare part kit
71477718	Kit 2DS Ex-i module

2 Intended use


The 2DS Ex-i module kit is only suitable for the replacement of an identical 2DS Ex-i module for the purpose of repairing the CM44x(R).

Use for any purpose other than that described poses a threat to the safety of people and of the entire measuring system, and is therefore not permitted.

The manufacturer is not liable for damage caused by improper or non-intended use.

3 Authorized installation personnel

- Installation, commissioning, operation and maintenance of the measuring system may only be carried out by qualified technical personnel specially trained for the task.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may only be performed by an electrical technician.
- The technical personnel must have read and understood the Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

 Repairs not described in the Operating Instructions provided must only be carried out directly at the manufacturer's site or by the service organization.

4 Safety instructions

The following safety instructions must be observed. The Operating Instructions for the device must be followed.

4.1 Workplace safety

As the user, you are responsible for complying with the following safety conditions:

- Installation specifications
- Local standards and regulations

4.2 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.
3. Do not operate damaged products, and protect them against unintentional operation.
4. Label damaged products as defective.

During operation:



1. If faults cannot be rectified:
Products must be taken out of service and protected against unintentional operation.
2. The display cover must be kept closed outside of service and maintenance tasks.

4.3 Product safety

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.








5 Symbols

5.1 Warnings

Structure of information	Meaning
 DANGER Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ► Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation will result in a fatal or serious injury.
 WARNING Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ► Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation can result in a fatal or serious injury.

Structure of information	Meaning
<div><div>⚠ CAUTION</div><div>Causes (/consequences) If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action</div></div>	<div>This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.</div>
<div><div>ℹ NOTICE</div><div>Cause/situation If necessary, Consequences of non-compliance (if applicable) ▶ Action/note</div></div>	

5.2 Symbols used


-  Additional information, tips
-  Permitted or recommended
-  Not permitted or not recommended
-  Reference to device documentation
-  Reference to page
-  Reference to graphic
-  Result of a step


6 Scope of delivery

71477718 Kit 2 DS Ex-i module

Item	Description	Quantity	Base unit
a	2DS Ex-i module	1	Piece
	Service kit instructions	1	Piece

a

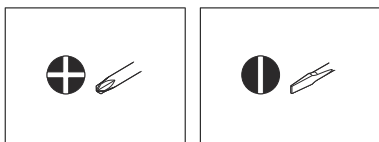


 1

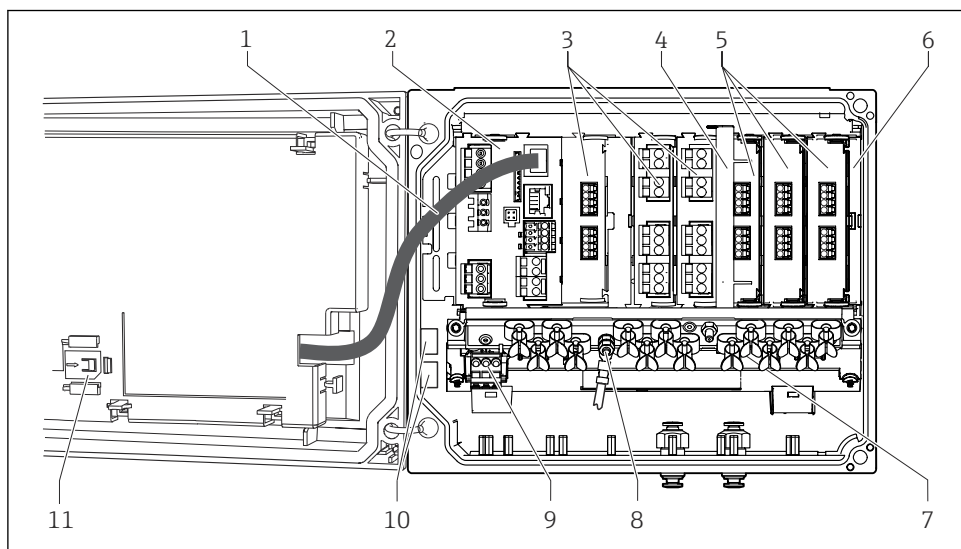
Kit 2DS Ex-i module

A0050181

7 Tools list



8 Replacement of modules (using the example of CM448 with the sensor communication module type 2DS Ex-i)



A0045639

2 Example of a field device with sensor communication module type 2DS Ex-i and open display cover (without wiring)

- | | | | |
|---|---|----|--|
| 1 | Display cable | 7 | Cable mounting rail |
| 2 | Base module | 8 | Threaded bolt for protective ground connection |
| 3 | Extension modules (optional) | 9 | Extension power unit |
| 4 | Separator element (pre-installed) | 10 | Distributor terminals for user-defined use ¹⁾ |
| 5 | Sensor communication modules 2DS Ex-i | 11 | Storage slot for SD card |
| 6 | Shock protection, dummy cover and end cover | | |

- 1) Example: you want to loop the signal from the alarm relay to a siren and a lamp. The terminals on the alarm relay only accommodate one cable. Route the signal from the alarm relay to a terminal on the distributor block. The block's terminals are all interconnected. You therefore have 3 additional terminals on this block from where you can carry the signal forward to the consumer (siren, lamp etc.). The signal can be multiplied in this way.

8.1 Wiring

⚠ WARNING

The device is live.

Incorrect connection may result in injury or death.

- ▶ Prior to commencing the work, make sure no voltage is applied at any of the cables. The electrical connection may only be established by a certified electrical technician. Technical personnel must have read and understood the instructions in this manual and must adhere to them.

⚠ WARNING

Module is not covered.

No shock protection. Risk of electric shock!

- ▶ If not all slots are occupied, always insert a dummy cover or end cover in a free slot. This protects the device from impact.

8.2 Opening the housing

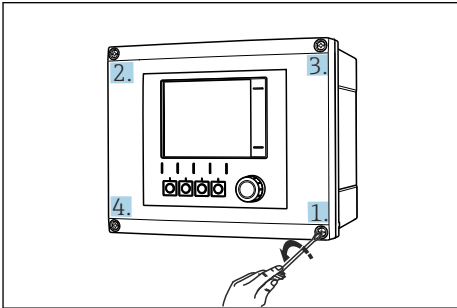
NOTICE

Pointed or sharp tools

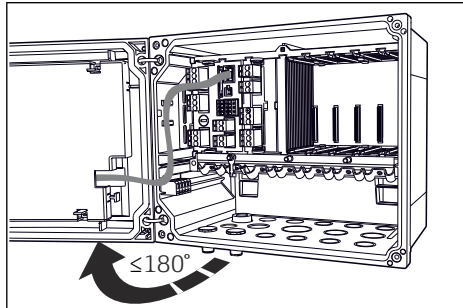
If unsuitable tools are used, they can scratch the housing or damage the seal, and thus have a negative impact on the leak-tightness of the housing.

- ▶ Do not use any sharp or pointed objects, such as a knife, to open the housing.
- ▶ Only use a suitable Phillips screwdriver.

Liquiline CM44x:



- 3 Releasing housing screws in a diagonally opposite sequence with Phillips screwdriver



- 4 Opening display cover, max. opening angle 180° (depends on installation position)

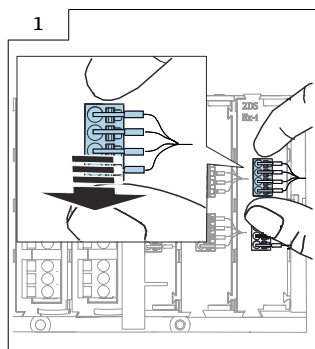
8.3 Disconnecting the plug-in terminals / cables

Disconnect the plug-in terminals from all modules that are to be replaced. If the plug-in terminal is faulty, disconnect the cables from the plug-in terminals and replace the plug-in terminal.

8.3.1 Disconnecting the plug-in terminal with the cable

If the plug-in terminal is intact:

- ▶ Disconnect the cable with the plug-in terminal in order to avoid rewiring.

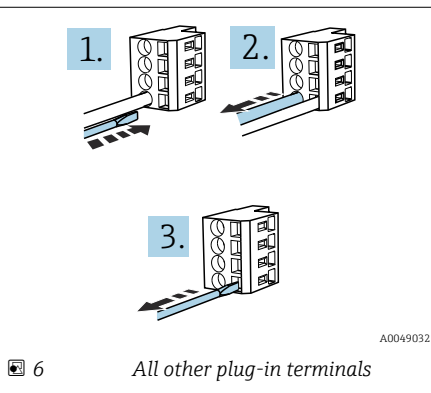
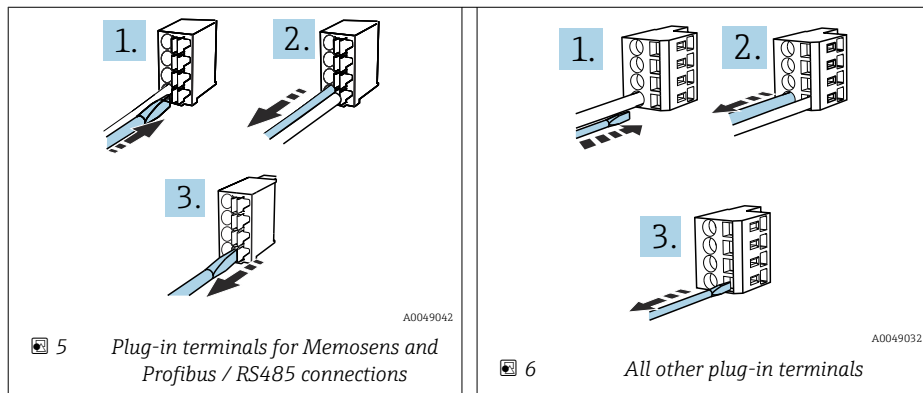


A0049054

8.3.2 Disconnecting the cable from the plug-in terminal

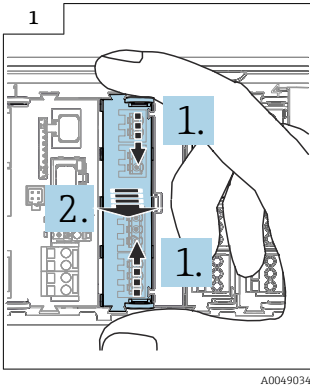
If the plug-in terminal is faulty:

1. Press the screwdriver against the clip (opens the terminal).
2. Remove the cable.
3. Remove the screwdriver (closes the terminal).

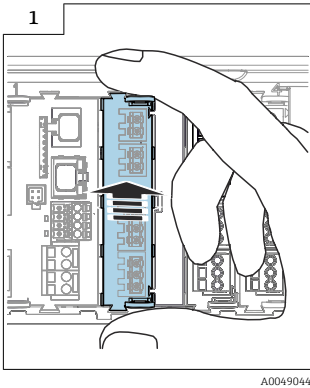


8.4 Replacement of the modules


8.4.1 Replacement of modules not connected to the separator element

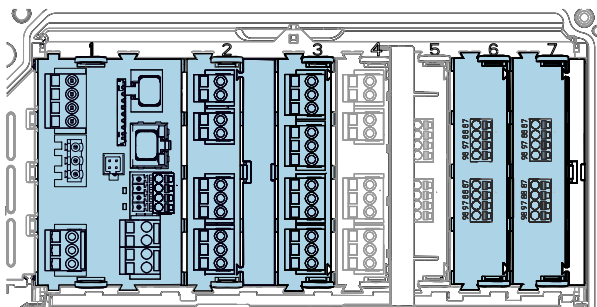


- Replace the module you have removed with a new replacement part.



- Snap the locking elements fully into their starting positions.

 All modules marked blue can be replaced by unplugging the old module and plugging in the new one.

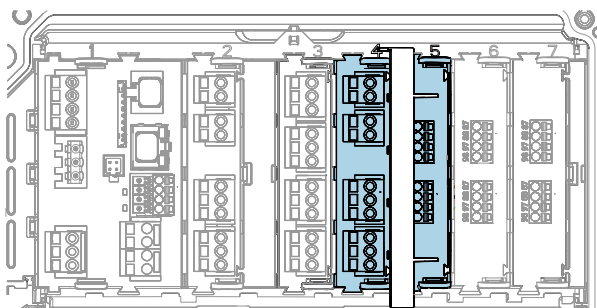


A0049035



Modules that can be replaced by unplugging/plugging.

8.5 Replacement of the modules connected to the separator element



A0049036

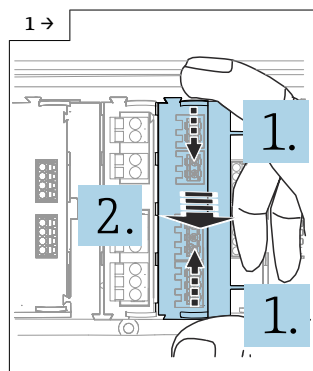


Modules located to the left and right of the separator element.

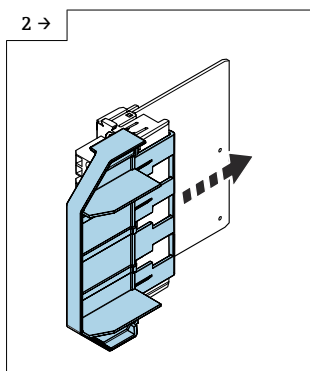
8.5.1 Replacement of the module to the left of the separator element

1. Remove the module on the left of the separator element together with the separator element.
2. Disconnect the separator element from the left module.
3. Replace the module you have removed with a new replacement part.
4. Reuse the separator element.

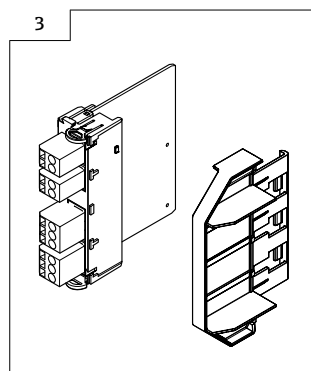
5. Slide the separator element onto the new replacement part.



A0049037

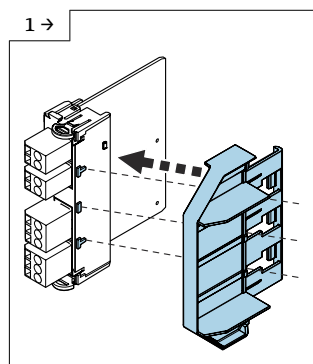


A0049127

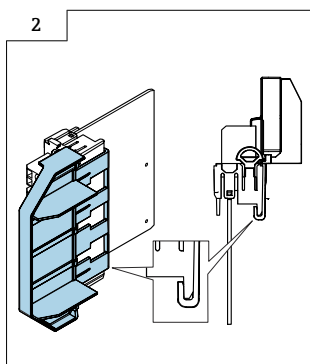


A0049128

1. Replace the module you have removed with a new replacement part.
2. Position the module cover between the contour of the separator element.
3. Position the catches between the spacers of the module cover.

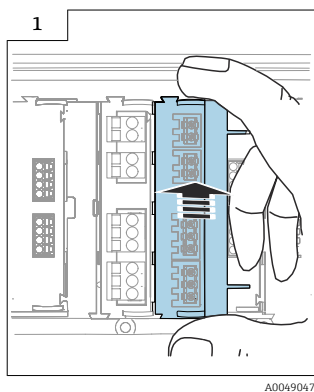


A0049210



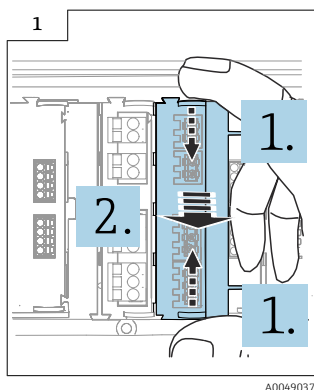
A0049206

- Snap the locking elements fully into their starting positions.

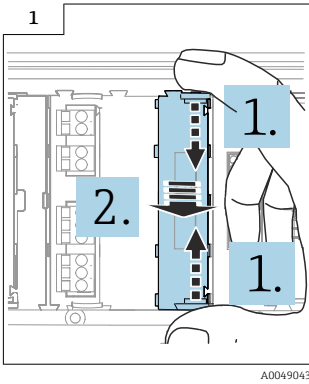


8.5.2 Replacement of the module to the right of the separator element

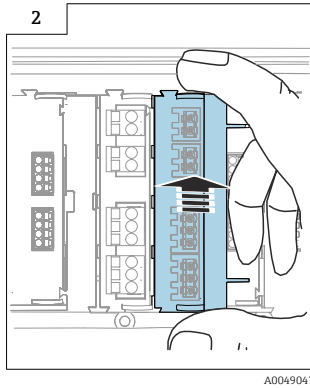
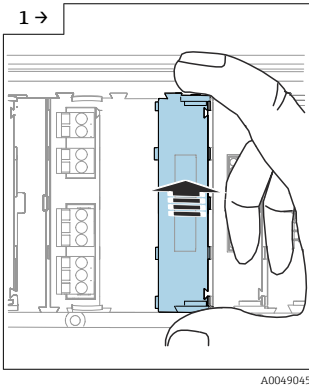
- Remove the module on the left of the separator element together with the separator element.



- Remove the module on the right of the separator element.



1. Replace the module you have removed with a new replacement part.
2. Install the module on the left of the separator element together with the separator element.
3. Snap the locking elements fully into their starting positions.



8.6 Replacement of the modules when replacing the backplane

- To replace the backplane, all the modules, covers and the separator element must be removed, as described in Section 8.3, 8.4 and 8.5. → 5



Follow the kit instructions for the backplane replacement.

- After replacing the backplane, the modules, covers and the separator element must be installed again in the same order they were in before being removed.



In the case of field devices, the order is also indicated on the inside of the cover.

8.6.1 Position of the module and separator element

The base module and fieldbus module (if present) have fixed slots:

- The base module (which is always present) always occupies slots 0 and 1
- Fieldbus module 485: if the module is fitted it always occupies slot 2

Assign all of the other modules in the following order to slots 2 (if there is no fieldbus module) or 3 to 7:

- Photometer module PEM (only for CM44P)
- Spectrometer module SEM (only for CM44P)
- Memosens input modules 2DS (DS = digital sensor)
- Digital inputs and outputs DIO (DIO = digital input output)
- Current input modules 2AI (AI = analog input)
- Current output modules 4AO or 2AO (AO = analog output)
- Relay modules AOR, 4R or 2R (AOR = analog output + relay, R = relay)

2DS Ex-i modules:

- 2DS Ex-i modules are positioned starting from the right. Exception CM442: insert the 2DS Ex-i module in slot 2.
- Insert a dummy cover in any slots that are empty.

Separator element:

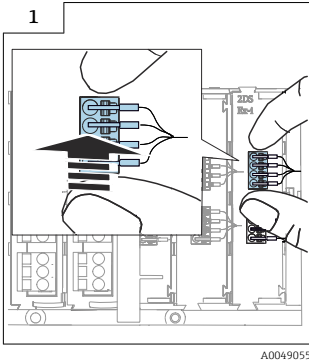
Only 2 positions are possible:

- CM442: separator element beside the base module
- CM444 / CM448 / CM44P: separator element between slot 4 and slot 5

8.7 Connecting the plug-in terminals / cables

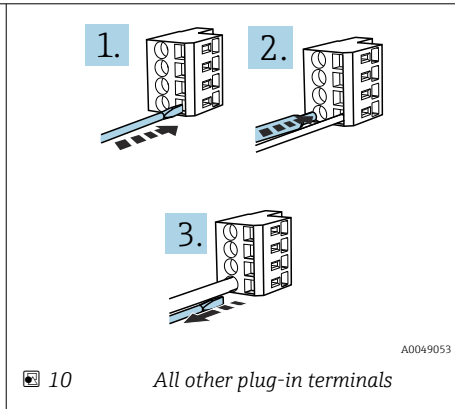
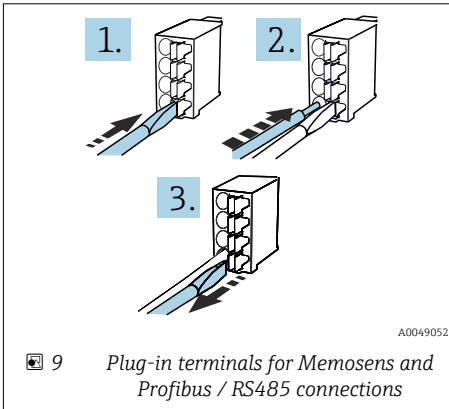
8.7.1 Inserting in the plug-in terminal with the cable

- Plug the plug-in terminals back in at the same position they were before they were removed.



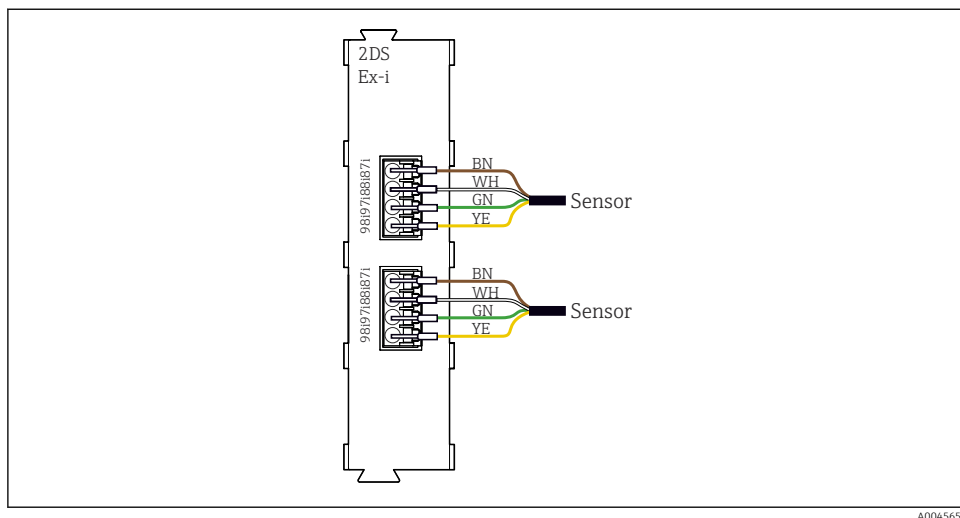
8.7.2 Inserting the cable into the plug-in terminal

1. Press the screwdriver against the clip (opens the terminal).
2. Insert the cable until the limit stop.
3. Remove the screwdriver (closes the terminal).



i After connection, make sure that every cable end is securely in place. Terminated cable ends, in particular, tend to come loose easily if they have not been correctly inserted as far as the limit stop.

8.7.3 Connecting the sensor communication module, type 2DS Ex-i



A0045659

- 11 Sensors without additional supply voltage connected to sensor communication module type 2DS Ex-i

i Only special Ex cables with a red marking may be connected to the sensor communication module.

ATEX

xYK10 and xYK20 1) according to BVS 04 ATEX E121X

IECEX

xYK10 and xYK20 1) according to IECEx BVS 11.0052X

NOTICE

Intrinsically safe digital sensors may only be connected to the sensor inputs of the sensor communication module 2DS Ex-i.

Non-intrinsically safe sensors may not be operated at a transmitter with a 2DS Ex-i card.

- ▶ The corresponding 2DS Ex-i terminals on the 2DS Ex-i module are disabled.

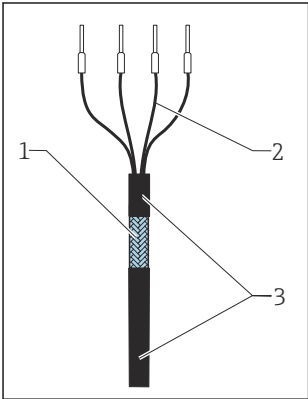
NOTICE

The cable shields of the intrinsically safe sensor must be connected to ground potential at the terminal strip of the transmitter.

- ▶ The cable shield may only be connected once to the potential equalization system. Intrinsically safe and non-intrinsically safe wiring of cables and connections must be established according to the separation requirements of IEC/EN 60079-14.

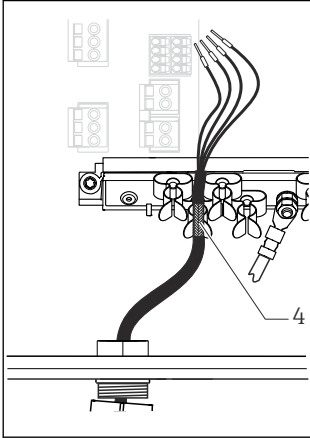
Field housing

Sample cable (does not necessarily correspond to the original cable supplied)



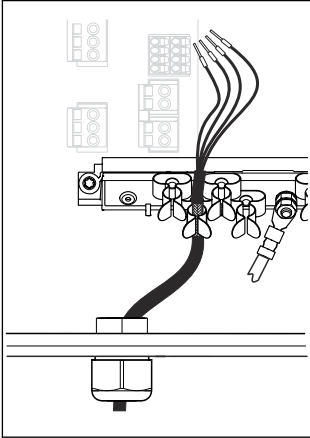
12 Terminated cable

- 1 Outer shield (exposed)
- 2 Cable cores with ferrules
- 3 Cable sheath (insulation)



13 Connect the cable to the grounding clamp

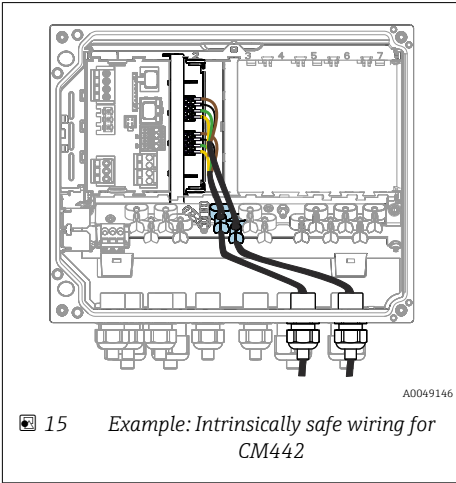
- 4 Grounding clamp



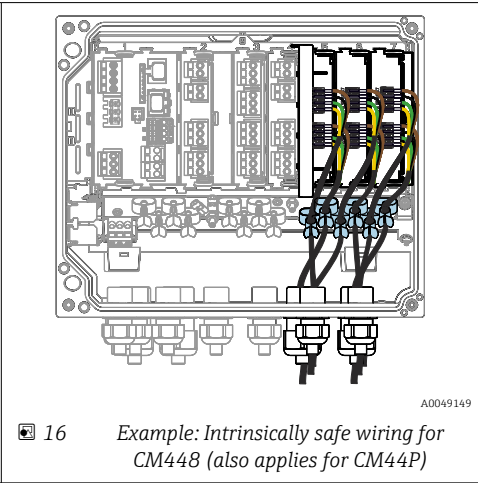
14 Press the cable into the grounding clamp

The cable shield is grounded using the grounding clamp ¹⁾

- 1) Observe the instructions in the "Ensuring the degree of protection" section



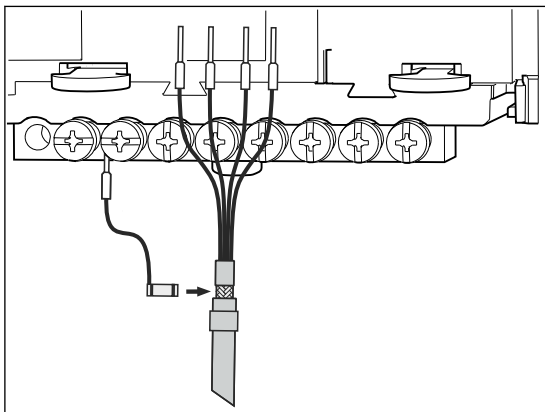
15 Example: Intrinsically safe wiring for CM442



16 Example: Intrinsically safe wiring for CM448 (also applies for CM44P)

Cabinet device

You must always connect the terminal strip with PE from the central node in the cabinet. Use the conductor with cable clamp that is included with the Memosens cable to connect the functional earth to the terminal strip of the device.

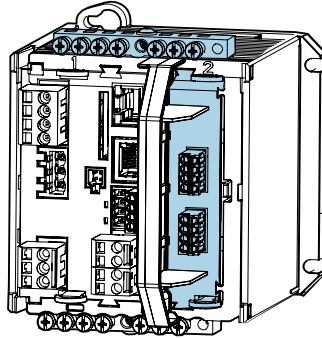


17

Functional earth connection



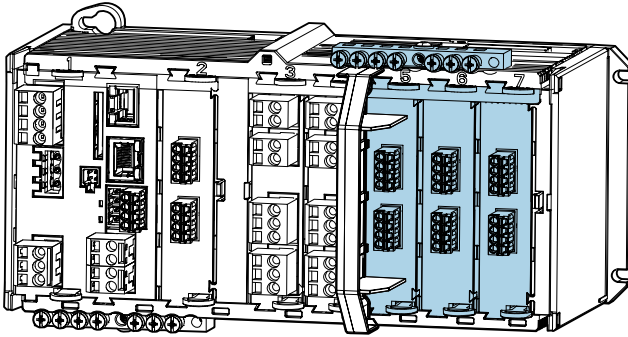
You must only ever connect one functional earth to each screw in the terminal strip. Otherwise, shielding is not guaranteed.



A0049142

18

Terminal strip for intrinsically safe wiring, CM442 R



A0049150

19

Terminal strip for intrinsically safe wiring, CM448 R

9 Disposal

- Observe the local regulations.



If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.



71575426

www.addresses.endress.com
