MINI-LINK™

DC Distribution Unit
Installation Instruction

ERICSSON

EN/LZT 110 2049 R4A

Contents

1 Introduction

This introduction describes how to install a DC Distribution Unit (DDU) with associated cabling. It also contains technical data and a formula for calculation of cable lengths.

1.1 Technical Description

The DC Distribution Unit (DDU) is used to distribute power supply to up to five MINI-LINK MMUs, MXUs, ICM-Cs or Fan units.

The DDU is connected to the primary power supply with a shielded battery cable. The primary power supply should have a fuse to protect the DDU and the battery cable.

Each output is protected by an automatic type fuse (6 A) combined with an ON/OFF switch.

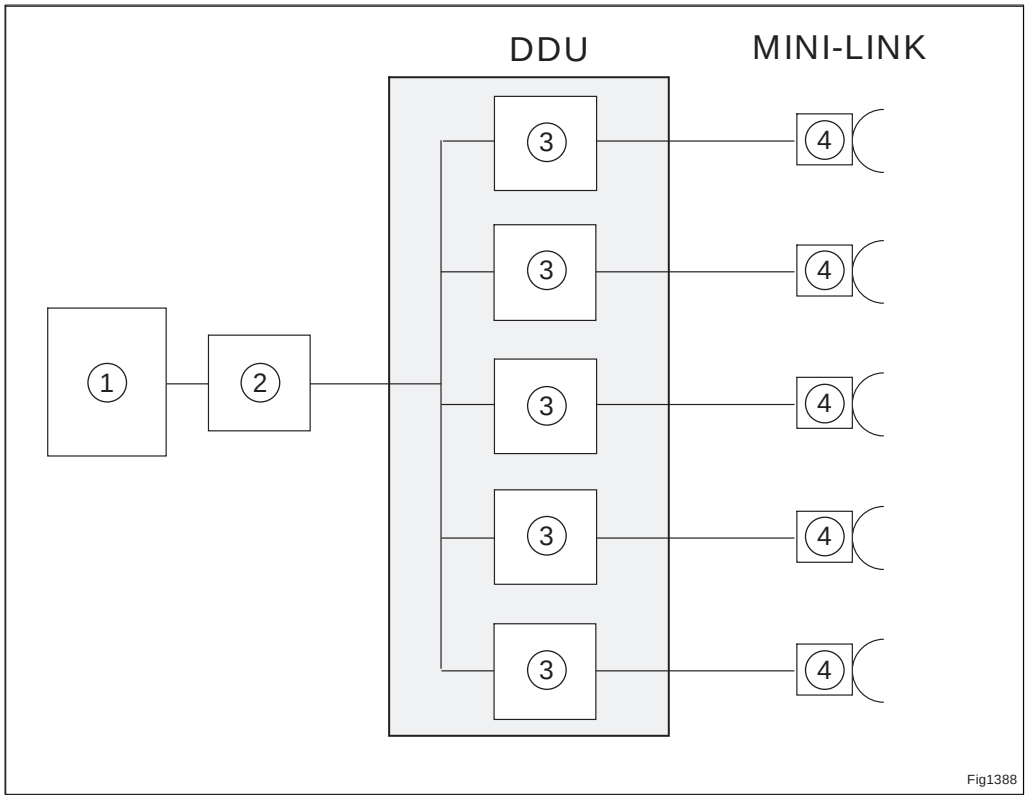

Figure 1-1. System configuration for the DC Distribution Unit

① Primary power supply.

② External fuse for the primary power supply.

③ Fuse for MINI-LINK equipment.

④ MINI-LINK equipment.

1.2 Product Codes

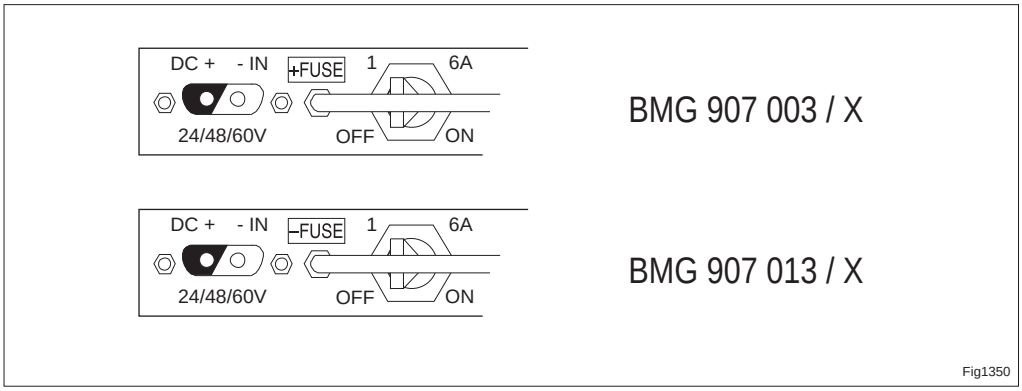

Figure 1-2. BMG 907 003/X (negative earth) and BMG 907 013/X (positive earth).

There are two versions of DDU available:

- BMG 907 003/X (Negative earth, common for + 24 V):
  The DDU is marked with a +FUSE label which means that the positive pole is connected to the DDU and the negative pole is connected to earth.
- BMG 907 013/X (Positive earth, common for - 48 V):
  The DDU is marked with a –FUSE label which means that the negative pole is connected to the DDU and the positive pole is connected to earth.

1.2.1 Index

There are two different indexes for product codes BMG 907 003 and BMG 907 013.See table below.

BMG 907 003/X (negative earth)	Index	
	/1	/4
DDU	included	included
Connector kit, SXK 111 516/2	included	-
Five pre-assembled cables, TSR 632 190/1	included	-
Screws and captive nuts, SXK 111 539/1	included	included
Earthing cable kit, SXK 111 514/2	included	included
Installation instruction, EN/LZT 110 2049	included	included

Table 1-1. Contents and index number for product code BMG 907 003.

BMG 907 013/X (positive earth)	Index	
	/1	/4
DDU	included	included
Connector kit, SXK 111 516/2	included	-
Five pre-assembled cables, TSR 632 190/1	included	-
Screws and captive nuts, SXK 111 539/1	included	included
Earthing cable kit, SXK 111 514/2	included	included
Installation instruction, EN/LZT 110 2049	included	included

Table 1-2. Contents and index number for product code BMG 907 013

2 Installation Equipment

The following tools are required for installation of the DDU:

- DC connector crimping tool, LSD 319 80
- Pin extraction tool, LSY 141 12
- Torx screwdriver TX 30 (M6)
- Slot tool type H (Philips) no 2

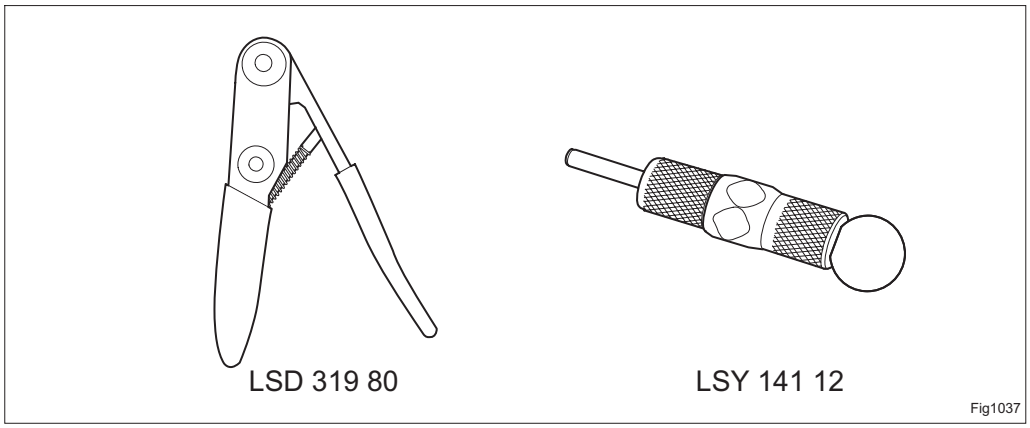

Figure 2-1. DC connector crimping tool and pin extraction tool.

3 Installation

3.1 Installing the DDU in a 19” Rack or Cabinet

The DDU should be fitted close to the MINI-LINK access module magazine.

Note: There should be at least 1U (44 mm) free space between the DDU and the AMM / Fan Unit

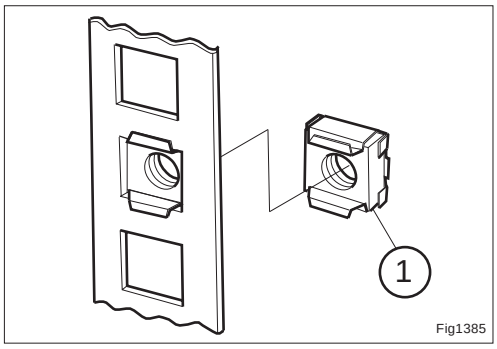

Figure 3-1. Fitting the captive nuts.

1. Fit two of the four captive nuts ① to the rack or cabinet (one on each side, as shown in the figure).

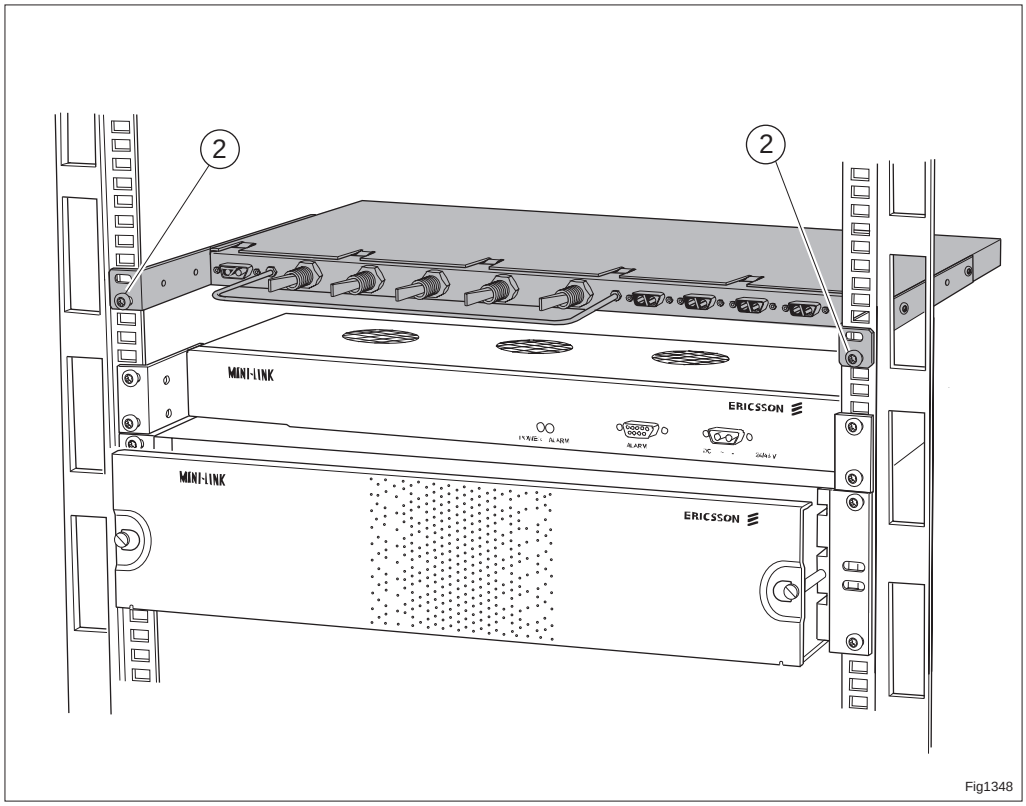

Figure 3-2. Installing the DDU in a 19” rack.

2. Fit the DDU in the rack or cabinet and tighten the screws ②, using a Torx screwdriver TX 30 (M6).

3.2 Installing the DDU with an AMM

To install the DDU next to an access module magazine on the wall, use the bars with screws and captive nuts included in the wall set.

Note: The bars can be sawn off to desired length.

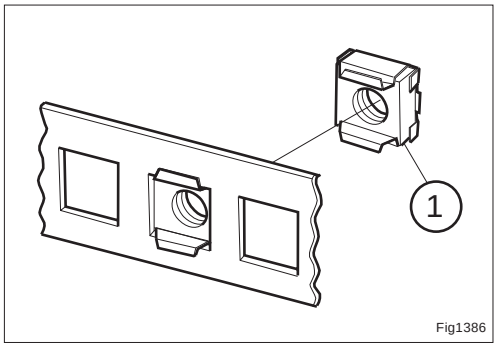

Figure 3-3. Fitting the captive nuts.

1. Fit two captive nuts ① to each bar.

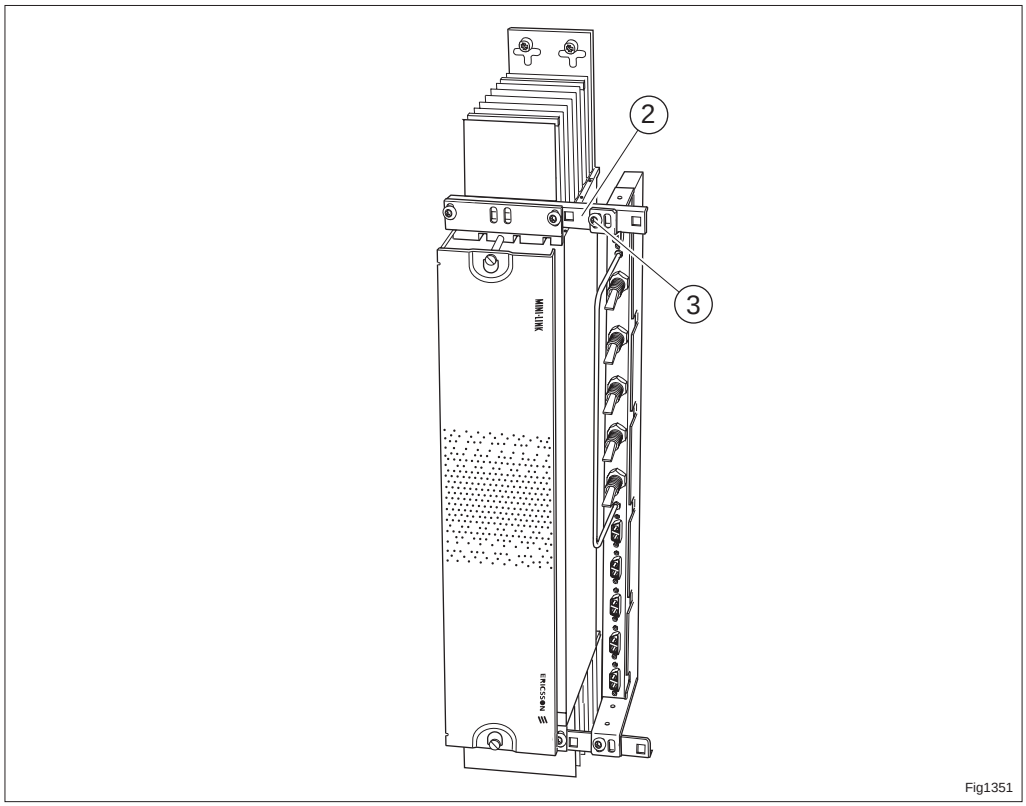

Figure 3-4. Installing the DDU next to a 2U magazine.

2. Fit a bar to each magazine bracket ② with the screws, using the Torx screwdriver TX 30 (M6).

3. Install the DDU between the two bars with two of the screws ③ and captive nuts included in the DDU kit (one to each bar), using the Torx screwdriver TX 30 (M6)

3.3 Connectors and Cables

Use the following connector kits and cables for connection of BMG 907 003/X and BMG 907 013/X.

BMG 907 003/X and BMG 907 0013/X	**Interface**	**/1**	**/4**
Connector kit, SXK 111 516/2	DC IN	included	ordered separately
TFL 424 03 or other shielded, twisted two pair cable, AWG 10	DC IN	ordered separately	ordered separately
Pre-assembled cables, TSR 632 190/1, 5pcs.	OUT 1-5	included	ordered separately*****

Table 3-1. Connectors and cables, BMG 907 003/X

* As an alternative cable and connector kit can be ordered separately, see *table 3-2* below.

Separate Cables and Connectors	**Interface**	**/4**
TFL 424 02 or other shielded, twisted two pair cable.	OUT 1-5	ordered separately
Connector kit, SXK 111 516/1, (1pc is included with MMU).	OUT 1-5	ordered separately

Table 3-2. Alternative cable and connectors for BMG 907 003/4 and BMG 907 013/4

Note: See MINI-LINK E Installation Manual, EN/LZT 110 2014, for instruction how to trim and assemble the cable, TFL 424 02, and Connector kit, SXK 111 516/1.

3.4 Maximum Cable Length for Cable TFL 424 03

The maximum length for the cable between the power supply and the DDU depends on the power consumption for the equipment connected to the DDU´s secondary side. The cable length is calculated from the formula below.

In the text below there are different examples describing how to calculate the cable length depending on the type of equipment used.

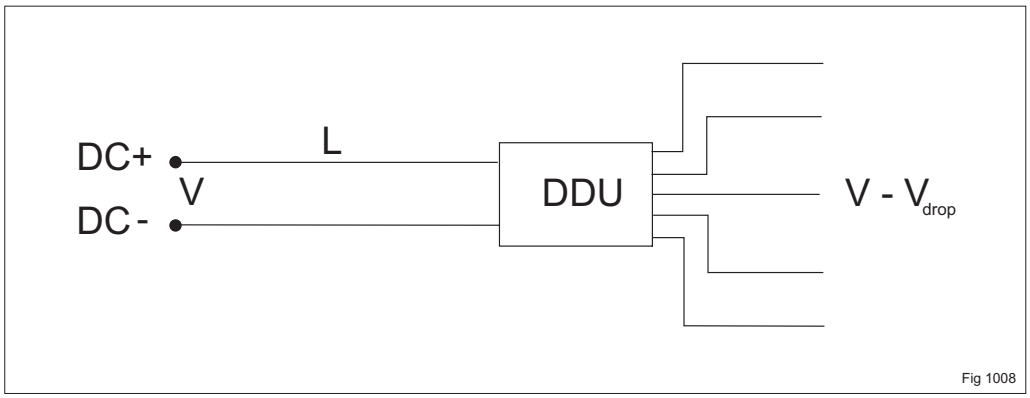

Figure 3-5. Parameters for calculation of maximum cable length.

$$L = \frac{V_{drop}}{I \times 2 \times R}$$

L : maximum cable length

I : maximum current for the MINI-LINK equipment in Amperes

R : Resistance, 3.5 Ω/km

Vdrop : maximum allowed voltage drop that is the difference between the specified minimum input voltage for the MINI-LINK equipment (see user's manuals for the equipment) and the specified minimum output voltage from the power supply. The voltage drop for the cable connecting the DDU and the plug-in unit shall be included (R=13.5 Ω/km) in the calculations.

Example 1; MINI-LINK E, RAU1, 1+0 with SAU, supply 48 V.

According to MINI-LINK E installation manual, section 10.4:

Maximum power consumption 54 W + SAU 10 W = 64 W

Minimum output voltage from supply (-15%): 40.8 V

Minimum input voltage for MMU: 20.4 V

$$\Rightarrow \quad I = \frac{64}{20.4}\,A \qquad V_{drop} = 40.8 - 20.4 = 20.4\,V \qquad R = 3.5\,\Omega/km$$

– Maximum length with <u>one</u> terminal connected to the DDU:

$$L = \frac{20.4 \times 20.4}{64 \times 2 \times 3.5} = 929\,m$$

– Maximum length with <u>four</u> terminals, of which one with SAU and a Fan unit connected to the DDU:

Maximum power consumption:	terminal	54 W
	terminal + SAU	64 W
	fan unit	10 W

$$L = \frac{20.4 \times 20.4}{(3 \times 54 + 64 + 10) \times 2 \times 3.5} = 252\,m$$

Example 2; MINI-LINK E, RAU1, 1+0 with SAU, supply 24 V

According to MINI-LINK E installation manual, section 10.4:

Maximum power consumption 54 W + SAU 10 W = 64 W

Minimum output voltage from supply : 21.0 V

Minimum input voltage to MMU: 20.4 V

$$\Rightarrow \quad I = \frac{64}{20.4}\,A \qquad V_{drop} = 21.0 - 20.4 = 0.6V \qquad R = 3.5\,\Omega/km$$

– Maximum length with <u>one</u> terminal connected to the DDU:

$$L = \frac{0.6 \times 20.4}{64 \times 2 \times 3.5} = 27\,m$$

– Maximum length with <u>four</u> terminals, of which one with SAU and a Fan unit connected to the DDU:

Maximum power consumption:	terminal	54 V
	terminal + SAU	64 W
	fan unit	10 W

$$L = \frac{0.6 \times 20.4}{(3 \times 54 + 64 + 10) \times 2 \times 3.5} = 7\,m$$

Example 3; MINI-LINK E, RAU2, 1+0 with SAU, supply 48 V.

According to MINI-LINK E installation manual, section 10.4:

Maximum power consumption 44 W + SAU 10 W = 54 W

Minimum output voltage from supply (-15%): 40.8 V

Minimum input voltage to MMU: 20.4 V

$\Rightarrow \quad I = \frac{54}{20.4}\,A \qquad V_{drop} = 40.8 - 20.4 = 20.4\,V \qquad R = 3.5\,\Omega/km$

– Maximum length with <u>one</u> terminal connected to the DDU:

$$L = \frac{20.4 \times 20.4}{54 \times 2 \times 3.5} = 1101\,m$$

– Maximum length with <u>four</u> terminals, of which one with SAU and a Fan unit connected to the DDU:

Maximum power consumption:	terminal	44 V
	terminal + SAU	54 W
	fan unit	10 W

$$L = \frac{20.4 \times 20.4}{(3 \times 44 + 54 + 10) \times 2 \times 3.5} = 303\,m$$

Example 4; MINI-LINK E, RAU2, 1+0 with SAU, supply 24 V

According to MINI-LINK E installation manual, section 10.4:

Maximum power consumption 44 W + SAU 10 W = 54 W

Minimum output voltage from supply : 21.0 V

Minimum input voltage 20.4V

$\Rightarrow \quad I = \frac{54}{20.4}\,A \qquad V_{drop} = 21.0 - 20.4 = 0.6V \qquad R = 3.5\,\Omega/km$

– Maximum length with <u>one</u> terminal connected to the DDU:

$$L = \frac{0.6 \times 20.4}{54 \times 2 \times 3.5} = 32\,m$$

– Maximum length with <u>four</u> terminals, of which one with SAU and a Fan unit connected to the DDU:

Maximum power consumption:	terminal	44 V
	terminal + SAU	54 W
	fan unit	10 W

$$L = \frac{0.6 \times 20.4}{(3 \times 44 + 54 + 10) \times 2 \times 3.5} = 9\,m$$

3.5 Preparing the Cable and Assembling the Connector for the Input Power Supply

Applies to cable TFL 424 03 and connector SXK 111 516/2. The figure below shows the parts included in the connector and the cable. Items ② to ⑤ are delivered inside the connector casing.

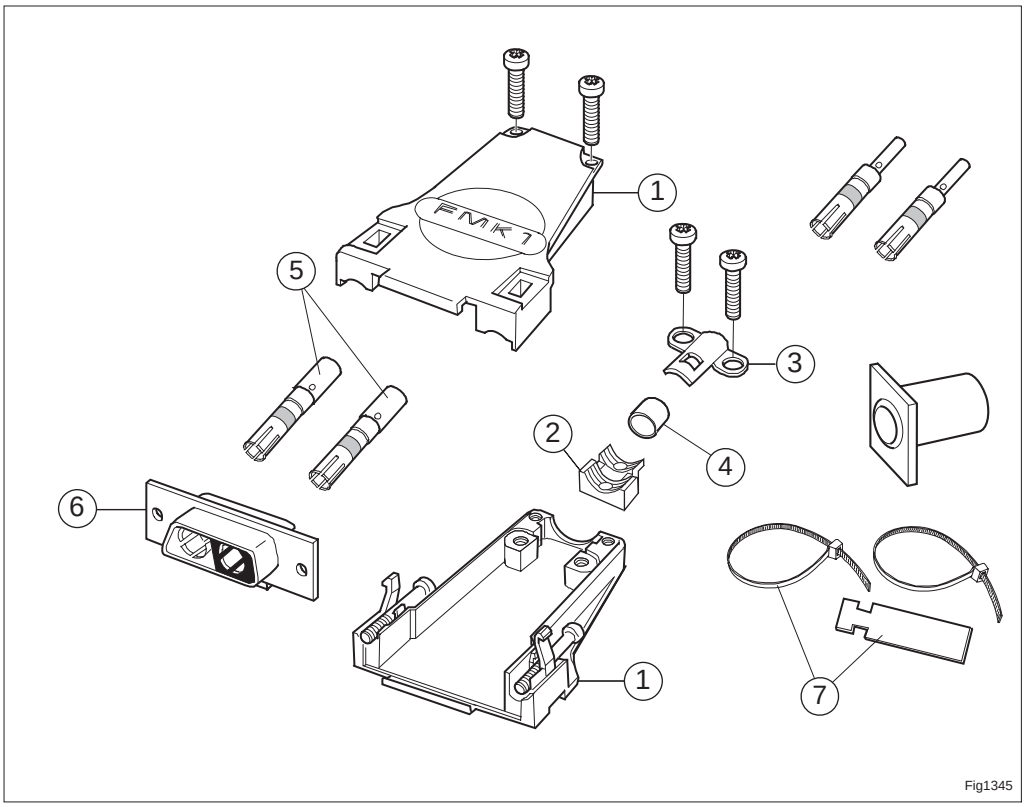

Figure 3-6. The DC connector.

① Connector casing
② Insert
③ Clamp
④ Tube
⑤ Contact sleeve
⑥ Contact socket
⑦ Label

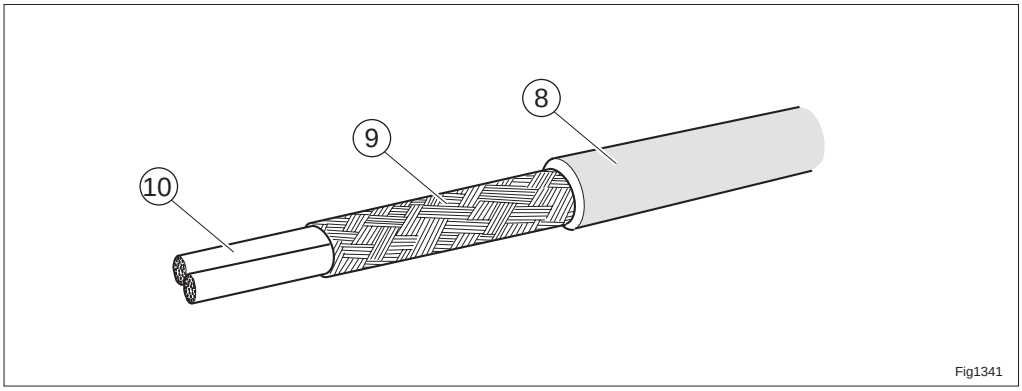

Figure 3-7. The DC cable.

⑧ Jacket

⑨ Screen

⑩ Wire

Opening the connector casing:

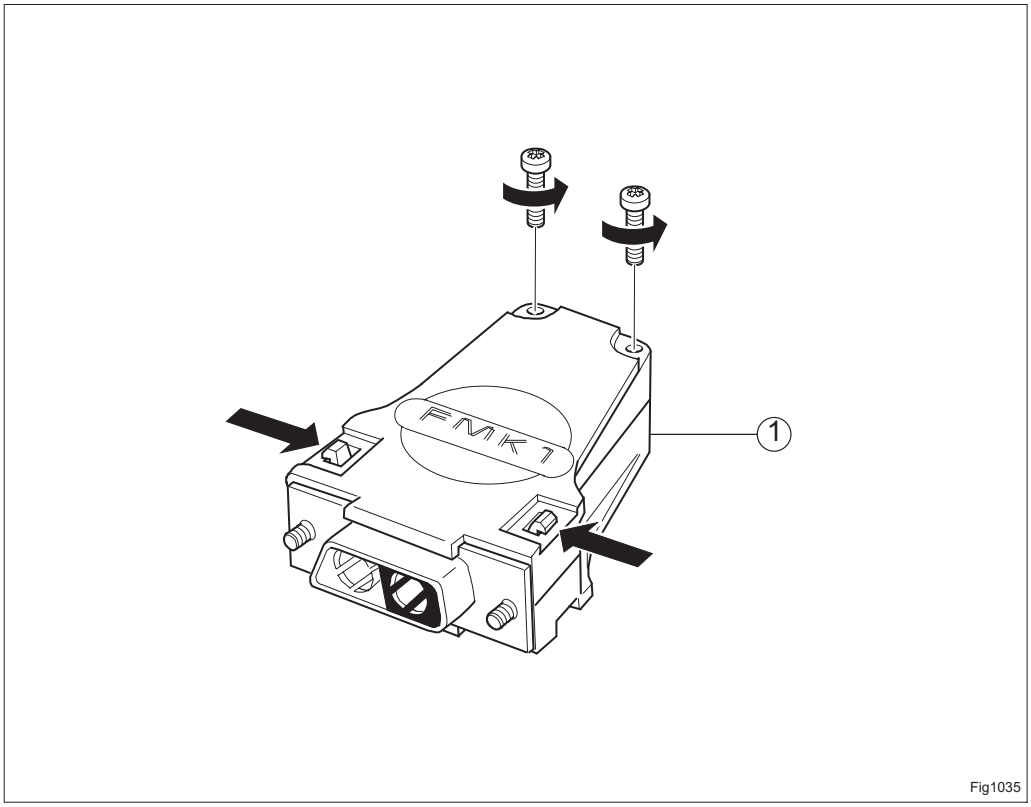

Figure 3-8. Opening the connector casing.

1. Open the connector casing ① by removing the screws, pushing the two plastic springs together and lifting the casing halves apart.

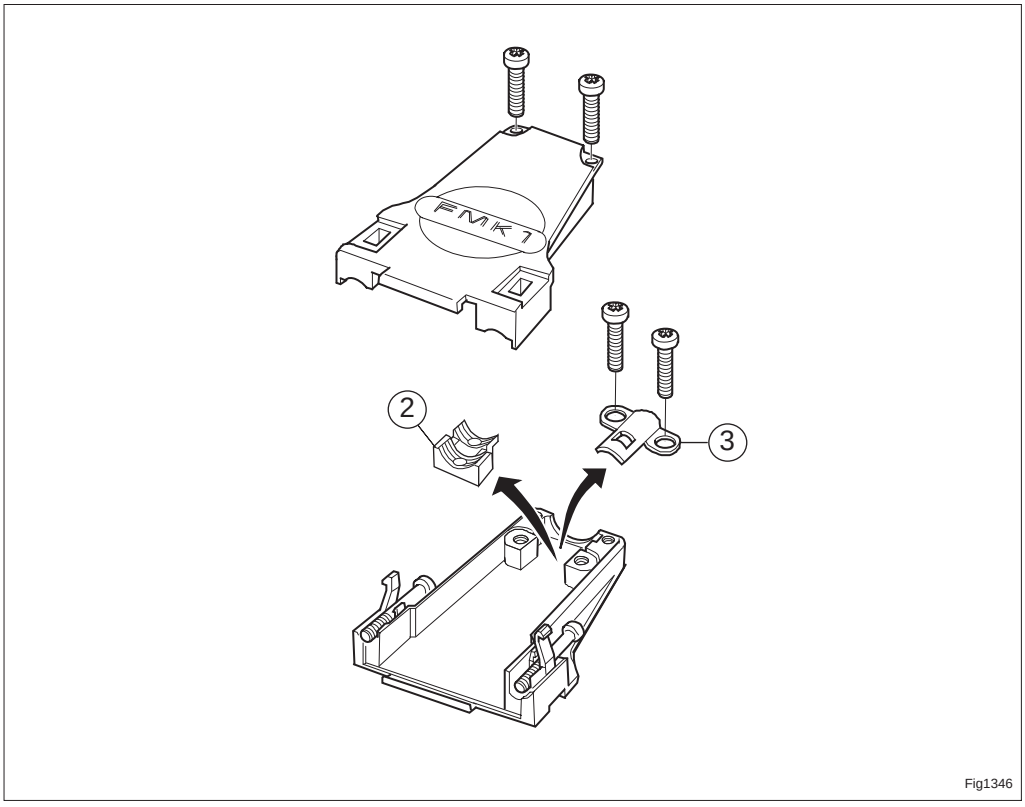

Figure 3-9. Removing parts.

2. Remove the insert ② and clamp ③ from the connector casing.

Trimming:

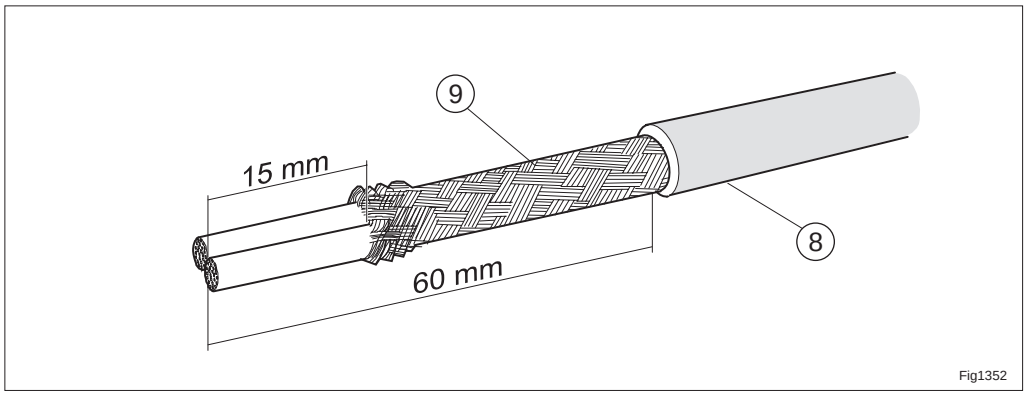

Figure 3-10. Stripping the cable.

3. Strip the jacket ⑧ approximately 60 mm.

4. Push the screen ⑨ back and cut the wires approximately 15 mm.

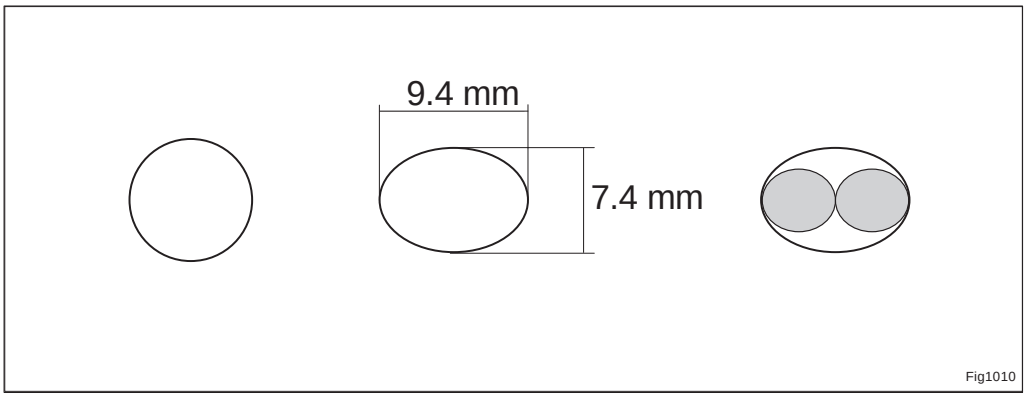

Figure 3-11. Shaping the tube.

5. Shape the tube until it has the measurements defined in *Figure 3-11* above. It will make it easier to slide the tube onto the screen and wires.

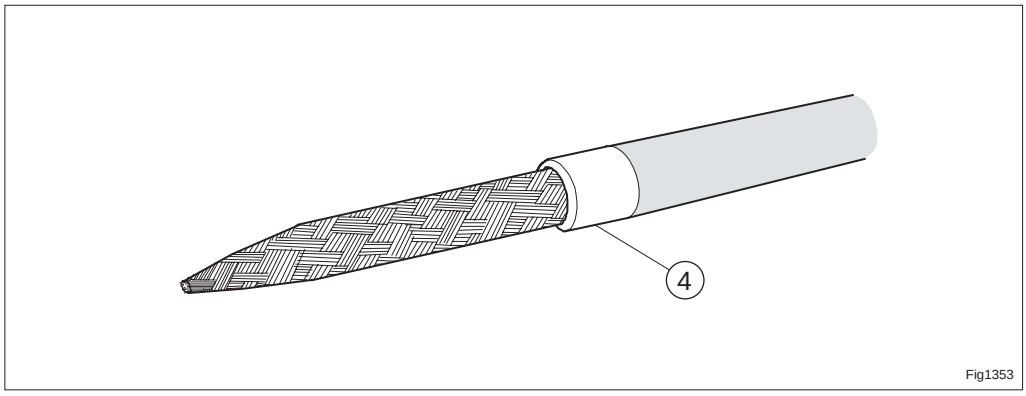

Figure 3-12. Fitting the tube.

6. Pull the screen down towards the cable end and slide the tube ④ over the screen and against the jacket.

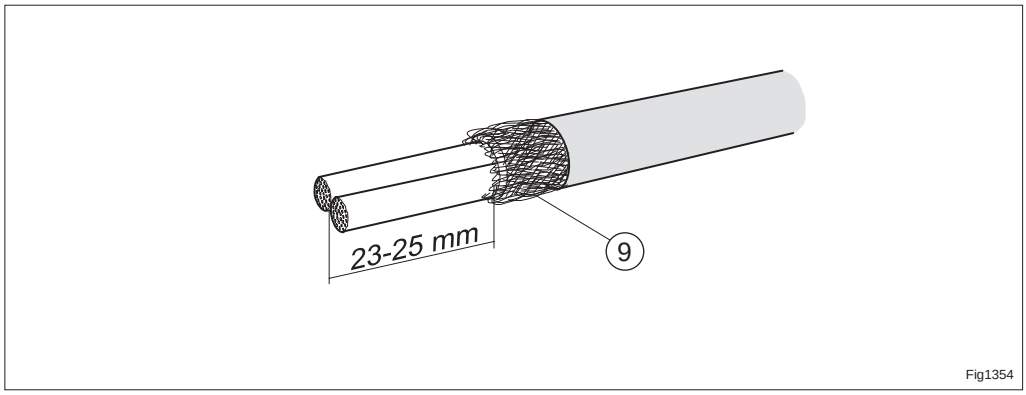

Figure 3-13. Folding the screen and cutting the wires.

7. Fold the screen ⑨ over the tube and trim the screen.

8. Cut the wires and leave 23-25 mm.

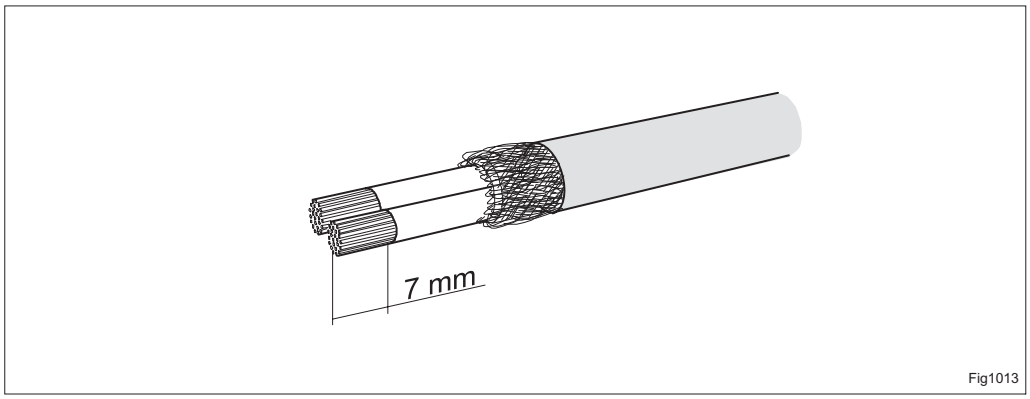

Figure 3-14. Stripping the wires.

9. Strip the wire 7 mm.

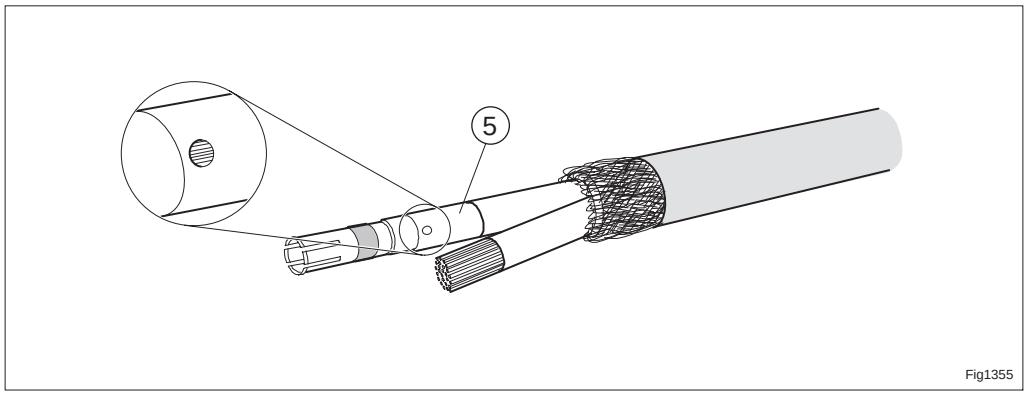

Figure 3-15. Assembling and crimping the contact sleeve and checking the inspection hole.

10. Slide the contact sleeve ⑤ over the wire and crimp it with crimping tool LSD 319 80. Note: Ensure that the wire is visible in the inspection hole when it is positioned for crimping.

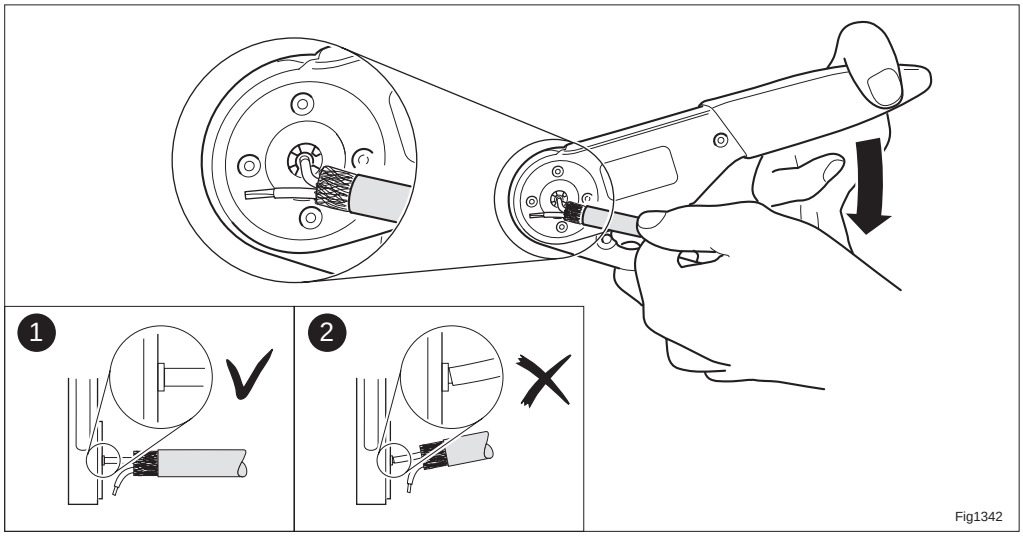

Figure 3-16. Using the crimping tool LSD 319 80.

11. Crimp the contact sleeve by using the crimping tool (LSD 319 80, number 3) and make sure the contact sleeve is inside the crimping tool during crimping. Also make sure the contact and wire are inserted at right angles to the tool ❶.
Example ❷ is incorrect.

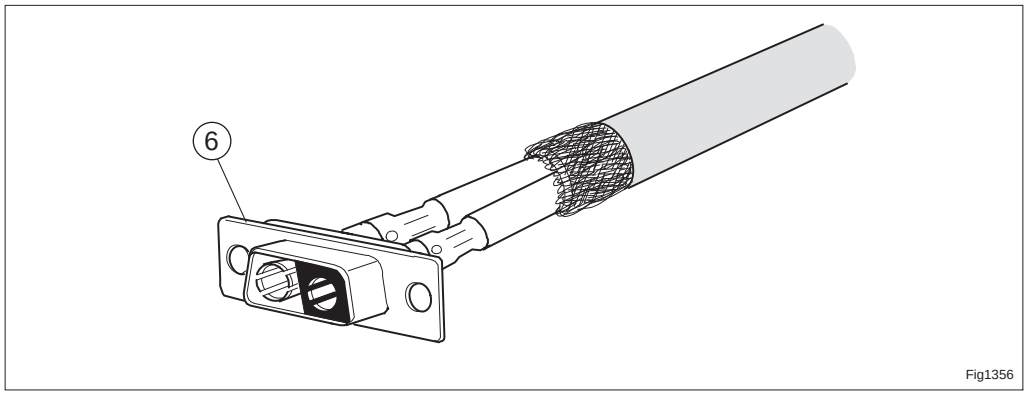

Figure 3-17. Inserting the contact sleeves into the contact socket.

External connector	Pin No	Signal	TFL 424 03
DC	1	DC +	Red
	2	DC -	Black

12. Insert the contact sleeves into the contact socket ⑥ according to the table above.

Note: If a contact is inserted improperly into the contact socket, use the pin extraction tool (LSY 141 12) to extract it.

Extracting the contact sleeves:

Items 13 and 14 only apply if a contact sleeve is inserted improperly.

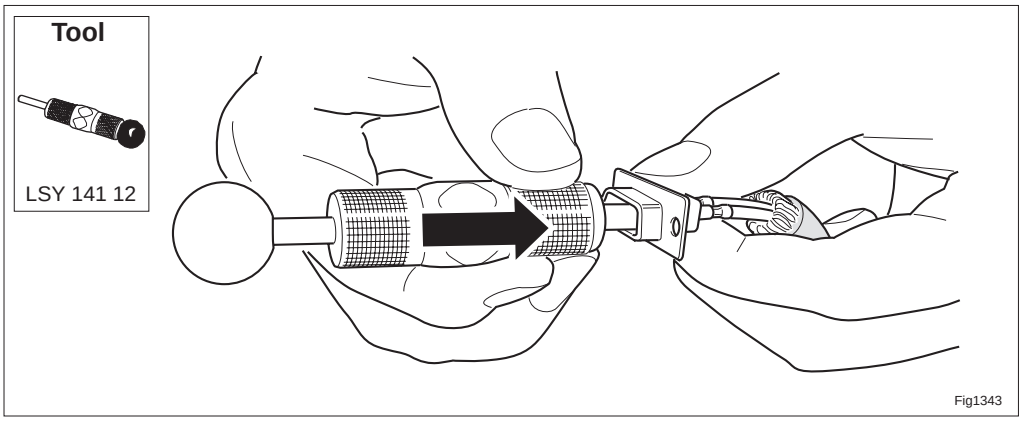

Figure 3-18. Applying the pin extraction tool on the contact socket.

13. Pull back the handle on the pin extraction tool, LSY 141 12, and apply it to the contact socket.

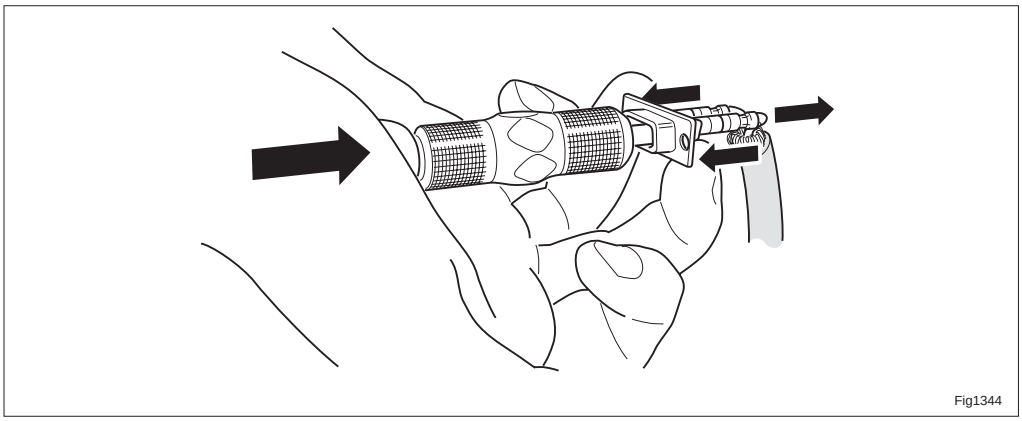

Figure 3-19. Extracting the contact sleeve from the contact socket.

14. Extract the contact sleeve by pressing the contact socket and the tool handle together.

Assembling:

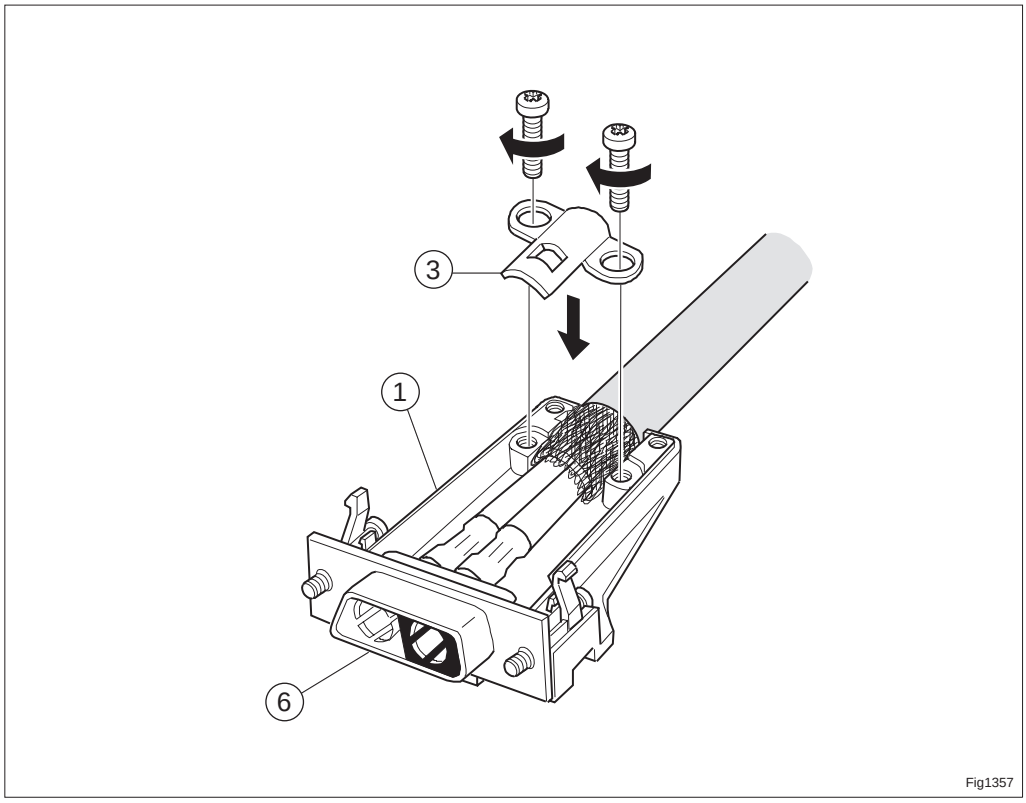

Figure 3-20. Assembling the connector in the connector casing using the clamp.

15. Lay down the cable and adjust the contact socket ⑥ in the connector casing ①.

16. Fasten the wires and screen with the clamp ③ included, using the cross slot tool, type H (Philips) no 1

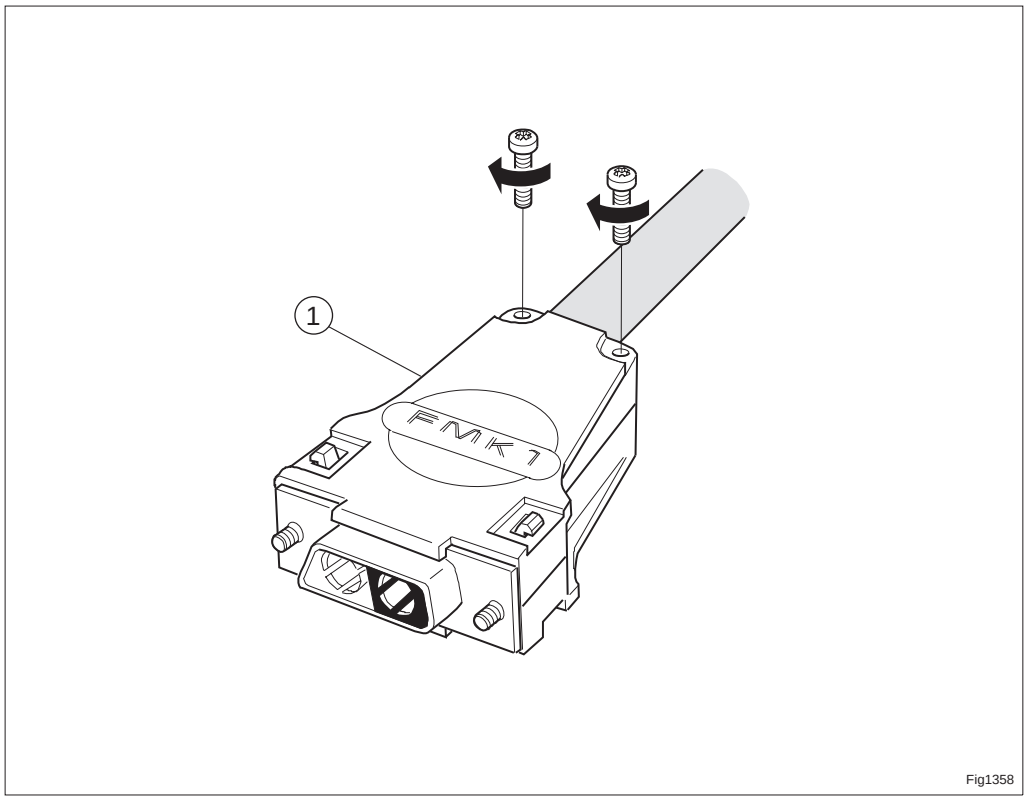

Figure 3-21. Assembling the connector.

17. Fasten the top of the connector casing ① with the screws using the cross-slot tool type H (Philips) no 2.

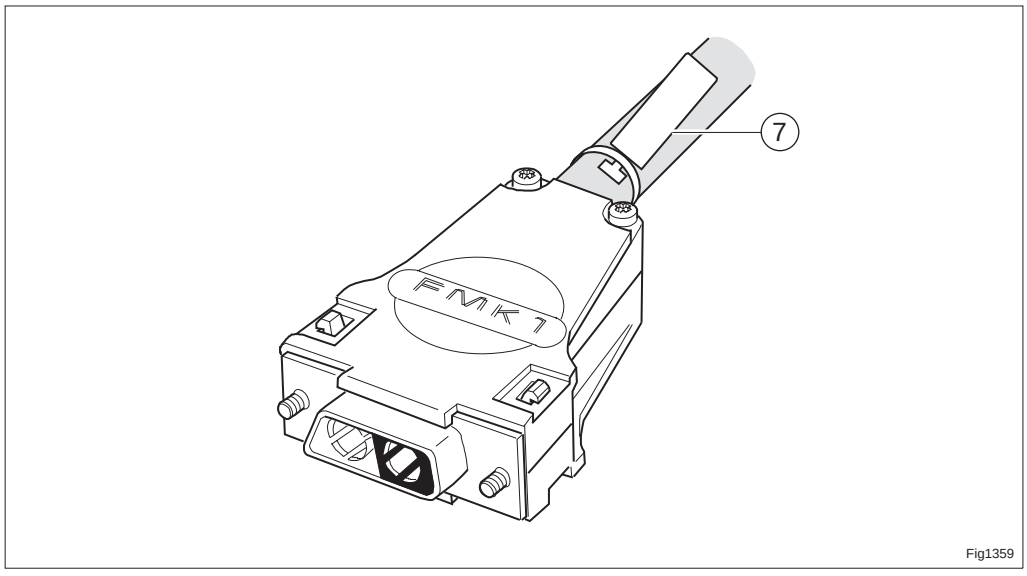

Figure 3-22. Fastening the tag.

18. Fasten a tag ⑦ to the cable using a strap.

19. Mark the assembled connector by writing on the yellow part of the tape and attaching it to the tag (wrapping the transparent part around the tag).

Note: There are two tags, one for each end of the cable.

3.6 Connecting the Cables

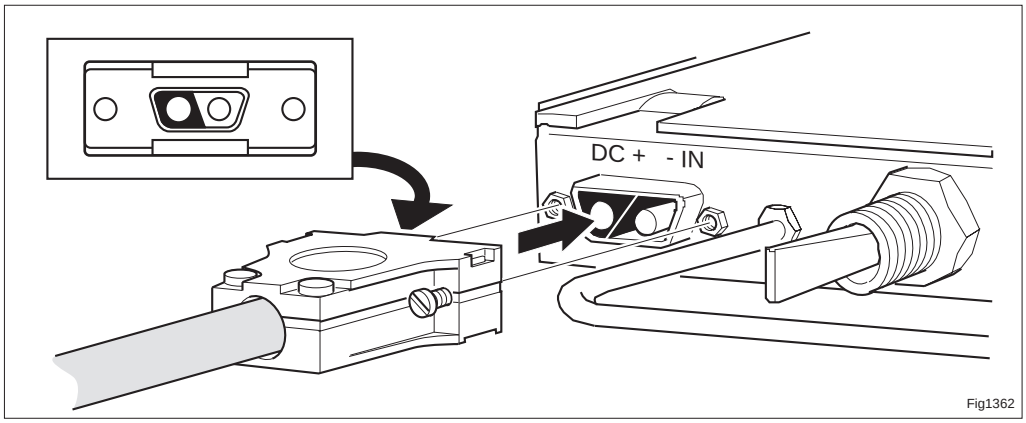

Figure 3-23. Connecting the primary power supply

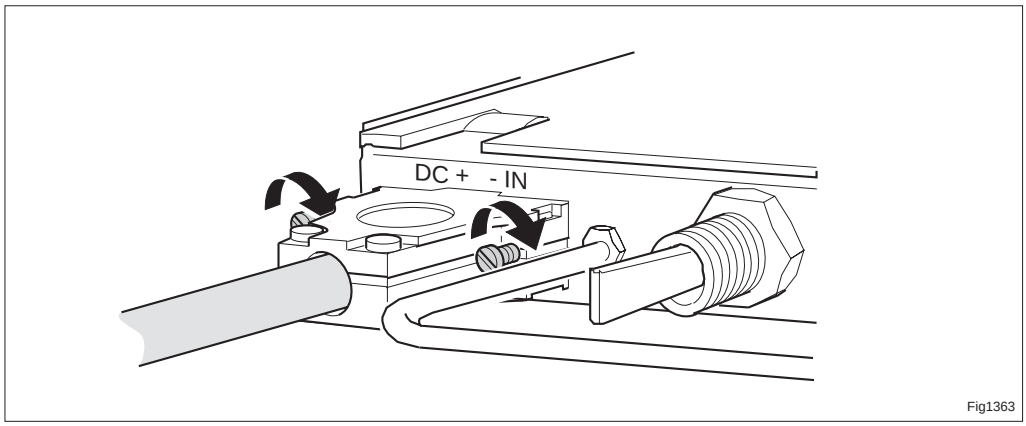

Figure 3-24. Fastening the connector with the screws.

1. Connect the primary power supply to the input port (DC IN) on the DDU and fasten the connector with the screws.
2. Make sure that the primary power supply is fused as required.

Note Considering total current for the MINI-LINK equipment, see MINI-LINK E Installation Manual, EN/LZT 110 2014.

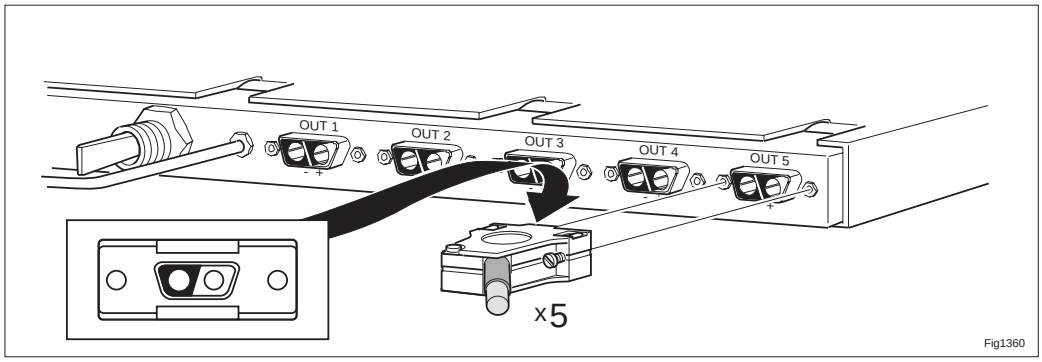

Figure 3-25. Connecting the MINI-LINK equipment.

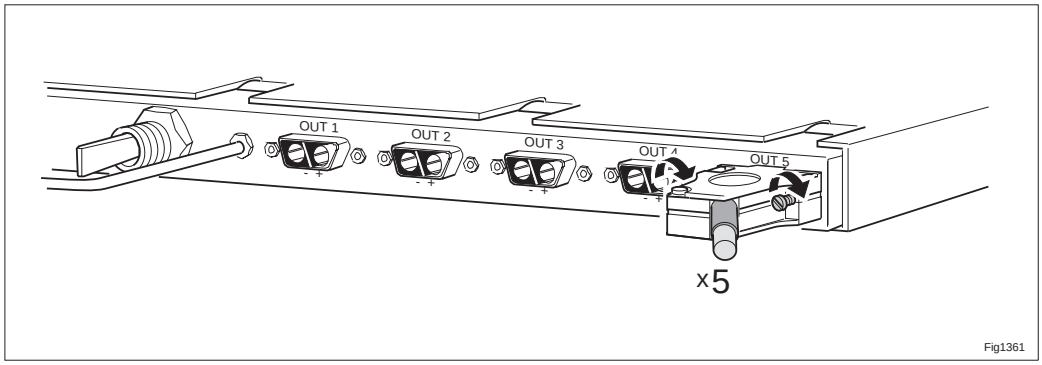

Figure 3-26. Fastening the connector with the screws.

3. Connect the MINI-LINK C or E equipment to the 1-5-output ports using the cable assemblies.

4. Set the ON/OFF switches to OFF.

5. Switch on the primary power supply

6. Switch on the secondary power supplies one by one and check that the green LEDs on the MINI-LINK C or E equipment are lit.

Note: Trimming and assembling cable, TFL 424 02, for connection of secondary power to the MINI-LINK equipment, see MINI-LINK E Installation Manual, EN/LZT 110 2014.

3.7 1+1 Connections

There are two connection alternatives available for a 1+1 hop:

Alt. 1: 1+1 connection with one DDU

Connect both MINI-LINK terminals to the same DDU:

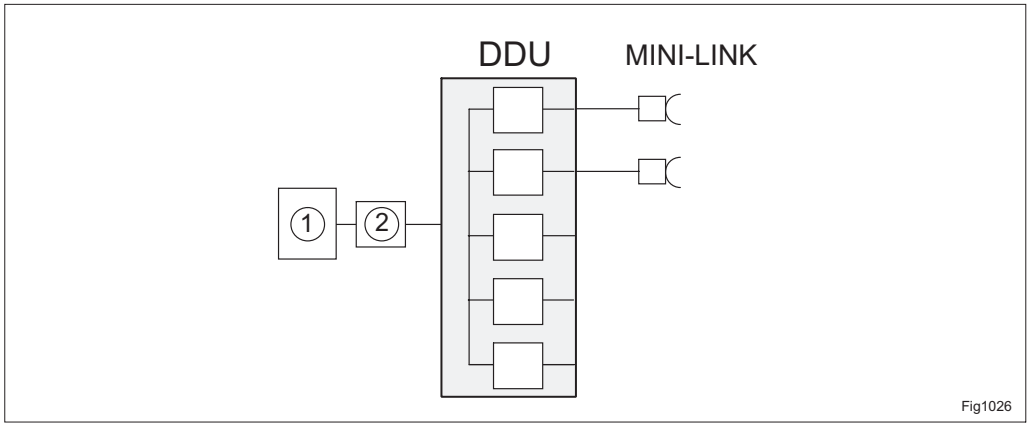

Figure 3-27. Connecting both terminals to same DDU.

Alt. 2: 1+1 connection with two DDUs

Connect each MINI-LINK terminal to a separate DDU (with a separate fuse) to minimize the risk for transmission interruption due to DC failure.

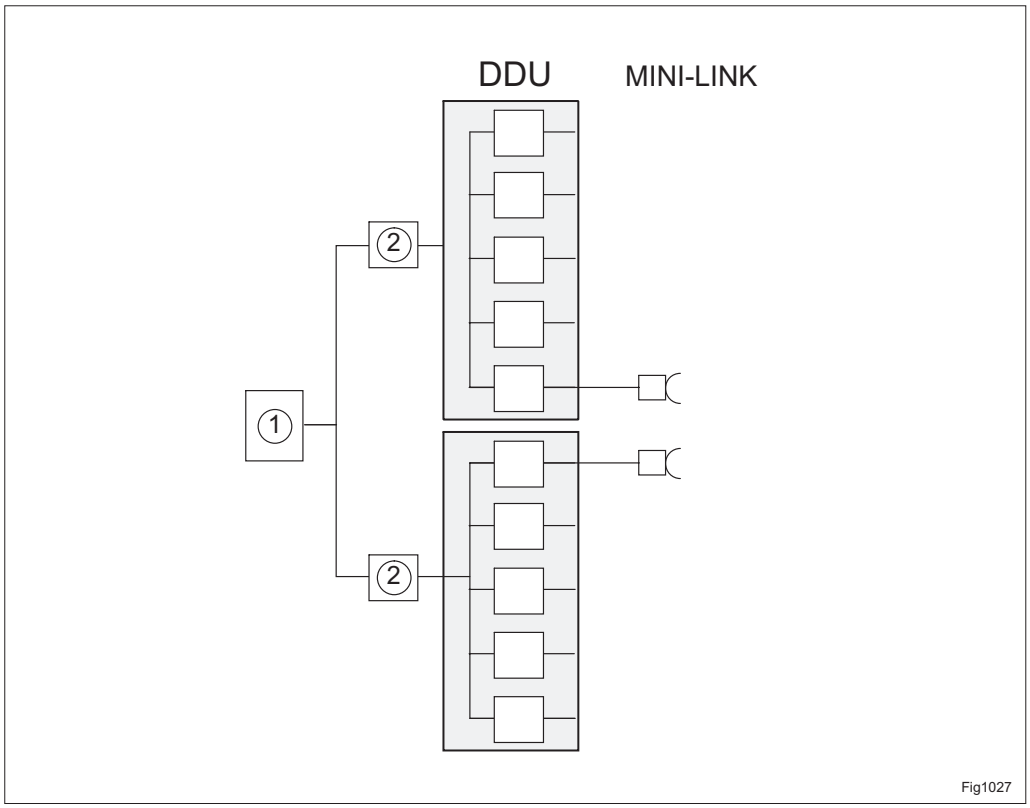

Figure 3-28. Connecting each terminal to separate DDU.

① Primary power supply.

② External fuse for the primary power supply.

4 Technical Data

Environmental Requirements

Ambient air temperature: -5 to +45 °C

Relative humidity: 5 to 96 %

Mechanical Data

Dimensions (H x W x D): 22 x 483 x 147 mm

Weight: 1.5 kg

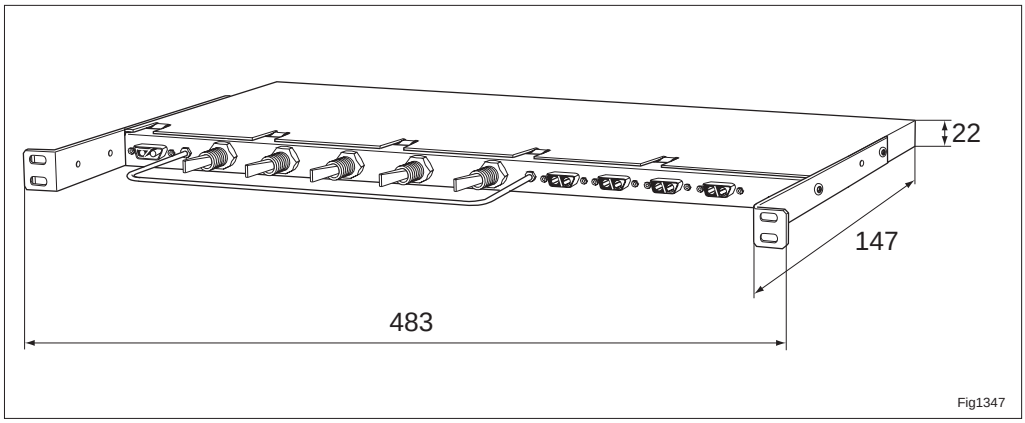

Figure 4-1. DDU dimensions.

Power Supply and Output Current

Input voltage: 24-60 V, nominal (20.4-72 including tolerance)

Maximum output current: 6 A per connector

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