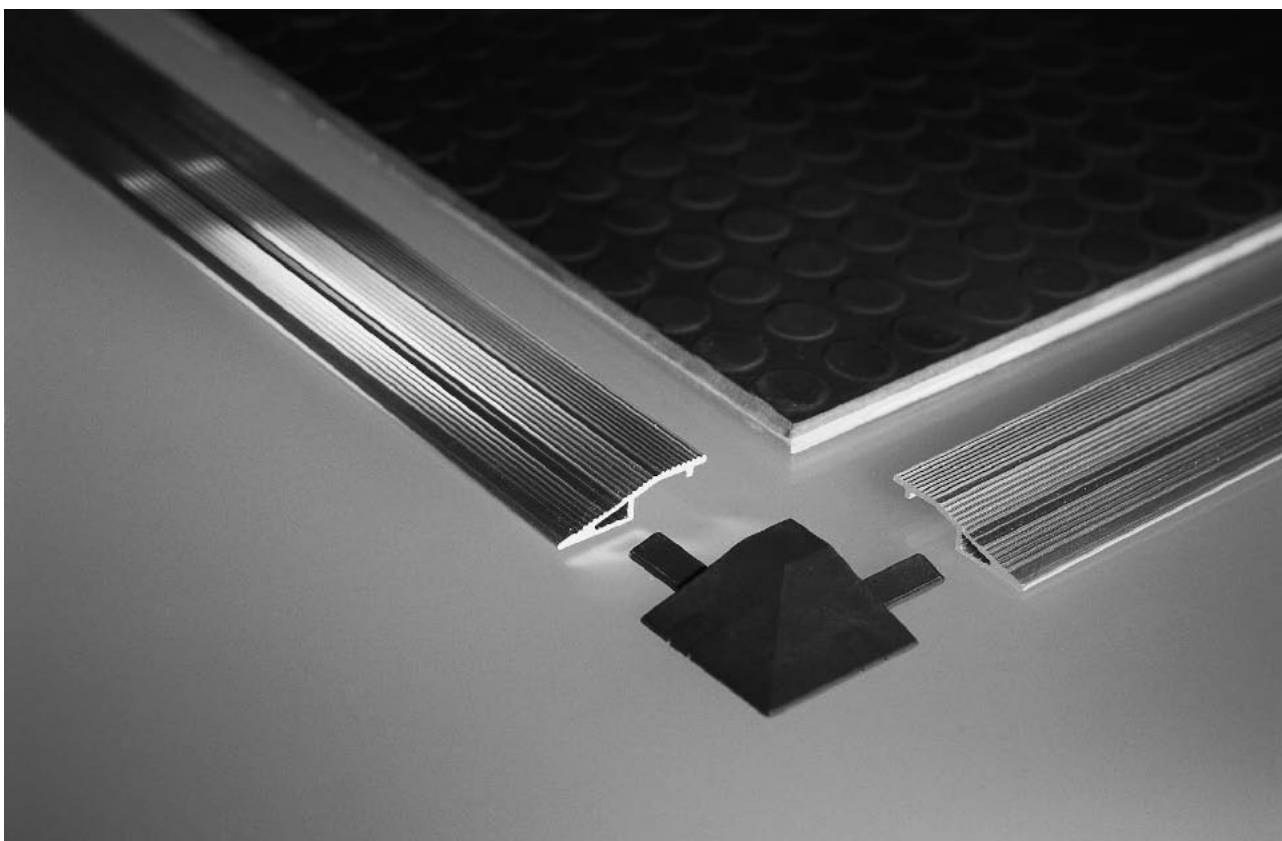


MAYSER®

Polymer Electric



Installation Instructions



Safety Mats 11 mm overall height

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1 About these installation instructions

These installation instructions are part of the product.

Mayser Polymer Electric accepts no responsibility or warranty claims for damage and consequential damage due to failure to observe the installation instructions.

- ➔ Read installation instructions carefully before use.
- ➔ Keep installation instructions for the complete service life of the product.
- ➔ Pass installation instructions on to every subsequent owner or user of the product.
- ➔ Add any supplement received from the manufacturer to the installation instructions.

Validity

These installation instructions are only valid for the products specified on the title page.

Target group

The target group of these installation instructions are operators and trained specialist personnel who are familiar with installation and commissioning.

Other applicable documents




- ➔ The following documents are to be observed in addition to the installation instructions:
 - drawing of the Safety Mat system (optional)
 - wiring diagram (optional)
 - operating instructions of the Control Unit used

Symbols used

Symbol	Meaning
➔ ...	Action with one step or with more than one step where the order is not relevant.
1. ... 2. ... 3. ...	Action with more than one step where the order is relevant.
• ...	Bullets first level
- ...	Bullets second level
(see chapter 1, pg. 3)	Cross-reference

Tab. 1-1: Other symbols

Danger symbols and information

Symbol	Meaning
<p>DANGER</p> 	Immediate danger leading to death or serious injury
<p>CAUTION</p> 	Possible danger which may lead to slight injury or damage to property.
	Information on easier or safer working practices.

Tab. 1-2: Danger symbols and information

2 Safety

2.1 Intended use

The product is designed as a pressure-sensitive protective device for protecting areas, which is activated when stepped on by persons with a weight of more than 20 kg.

2.2 Safety label on the product

A label is attached to the underside of every Safety Mat with symbols which warn against damage to the Safety Mat. In addition, you will find our contact address there.

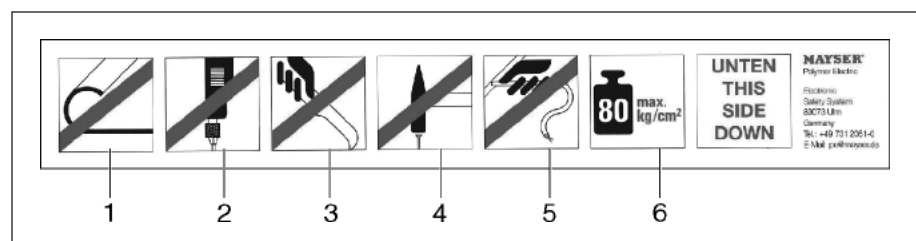


Fig. 2-1: Safety label on the product

- 1 Do not allow Safety Mat to bend or sag
- 2 Do not make holes or cut-outs in Safety Mat
- 3 Do not cut Safety Mat
- 4 Do not hammer or screw any objects (nails, screws etc.) into Safety Mat
- 5 Do not use the cable as a carrying handle
- 6 The maximum load bearing capacity of the Safety Mat is 80 kg/cm²

2.3 Non-sensitive areas

Residual dangers

The edges of the Safety Mats are not sensitive (40 mm on the cable exit side, 10 mm on all other sides). When non-sensitive areas are stepped on, the protective function of the Safety Mat is not active.

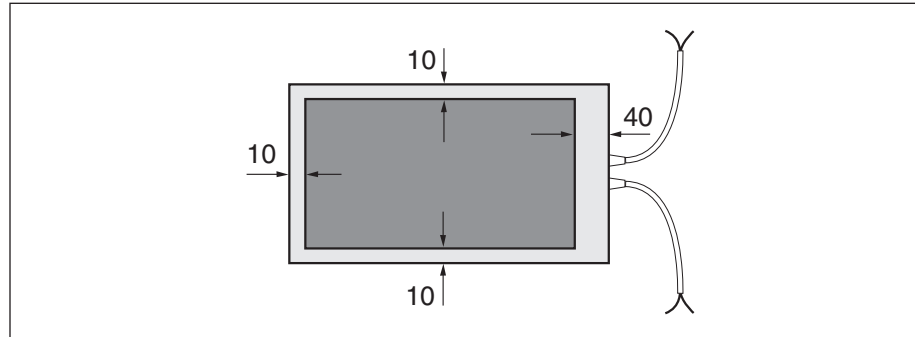


Fig. 2-2: Non-sensitive edges

- ➔ Install Safety Mats wherever possible in direct contact with the source of danger.
- ➔ When installing more than one Safety Mat, ensure that cable exit sides always remain clear.
- ➔ At the danger source, place a covering over parts (surfaces, cross-struts etc.) which could be used as a tread.
- ➔ When positioning the Safety Mats, observe the standard EN 999 “The positioning of safety equipment in respect of approach speeds of parts of the human body”.

Replacement parts

When using non-OEM replacement parts, the safety of the Safety Mats may be impaired.

- ➔ Only use OEM replacement parts from Mayser.

2.4 Applicable standards

The construction type of the product complies with the EC machinery directive 98/37/EC and the EMC directive 89/336/EEC.

Applicable standards:

- EN 1760-1 “Safety of machinery – Pressure-sensitive protective devices – Part 1: pressure-sensitive mats and pressure sensitive floors”
- EN 954 “Safety of machinery – Safety-related parts of controls”
- EN 61000-6-2 “Electro-magnetic compatibility (EMC) – Part 6-2: generic immunity standard for industrial areas”
- IEC 61508 “Functional safety of safety-related electrical/electronic/programmable electronic systems”

These installation instructions were prepared in compliance with DIN EN 62079 “Preparation of instructions – structuring, content and presentation”.

3 Technical data

Protection class of the Safety Mats	IP65
Actuation forces for signal triggering	in accordance with EN 1760-1
Behaviour in the event of a fault	EN 954 Category 3
Safety integrity level	SIL2 in accordance with IEC 61508
Operating temperature of individual Safety Mats	-5 °C to +55 °C
Operating temperature of combined Safety Mats	+5 °C to +55 °C
Storage temperature	-5 °C to +55 °C
Static load	max 800 N/cm ²
Weight	13.5 kg/m ²

Tab. 3-1: Technical data

Type plate

A type plate is attached to the cable exit on the underside of the Safety Mat for identification of the Safety Mat type. In the event of enquiries, have the specified information to hand.

4 Transport and storage

4.1 Packaging and transport

The Safety Mats are packed in wooden crates (max. 10 Safety Mats per crate) and can be transported to the installation site with a crane or lifting truck. Depending on the scope of supply, the installation accessories are either included with the Safety Mats or packed separately.

DANGER



Danger of injury due to components falling!

- ➔ Only use tested, suitable load bearing equipment.
- ➔ Use appropriate load securing devices (e.g. transport belts, anti-slip-ping devices).
- ➔ Do not stand under suspended loads.

4.2 Storage

- ➔ Store Safety Mats in the original packaging in a dry place.
- ➔ Note and observe storage temperature in accordance with the technical data.

5 Installation

Overview

Install Safety Mats in the following order:

1. Prepare the installation site.
2. Unpack Safety Mats and accessories.
3. Lay out Safety Mats.
4. Install cable conduits.
5. Place Safety Mats at stopping face of cable conduits.
6. Fix Safety Mats with ramp rail.
7. Lay cables.
8. Test for correct operation.

5.1 Preparing the installation site

DANGER



Danger of injury due to equipment and parts in the vicinity of the installation site! (possible electrocution, crushing danger)

- ➔ Disconnect all equipment and voltage-carrying parts in the immediate vicinity of the installation site from the power supply and secure against being switched on again (see relevant operating instructions).
- ➔ Check that the equipment or parts are disconnected from the power supply.

➔ Preparing the installation surface:

- Create level surface where necessary (e.g. screed). There must not be any bumps or holes with a diameter of more than 20 mm.
- Remove dirt particles.

➔ Provide necessary tools.

5.2 Unpacking

CAUTION



Damage to property due to incorrect handling!

Safety Mats can be damaged by bending or due to the effects of sharp objects.

- ➔ Always transport Safety Mats upright to prevent sagging.
- ➔ Safety Mats are always to be transported by two persons.
- ➔ Only place Safety Mats on a level, dirt-free, dry surface.
- ➔ Do not use the connection cable of the Safety Mats as a carrying handle.

-
1. Check that the contents of the packaging are undamaged.
 2. Lay out Safety Mats next to one another at the installation site (see chapter 5.4, pg. 8).

5.3 Laying out the Safety Mats

1. Approximately arrange Safety Mats (possibly in accordance with the drawing of the Safety Mat system). Observe the following:
 - lay the Safety Mats in such a way that the structured side is face up or the type plate is face down.
 - lay the Safety Mats in such a way that the cable exits are facing in the direction of the source of danger (cable conduit side).
2. Check the resistance between the two wire ends of the cable of each Safety Mat with an ohmmeter.

The measured resistance must be $> 1 \text{ M}\Omega$ (see chapter 5.8, pg. 14).



Ensure that no short circuit can ensue between the strands of the second cable!

3. Arrange all fixing rails (ramp rails, cable conduits) at a short distance from their final position in order to arrange the Safety Mats.

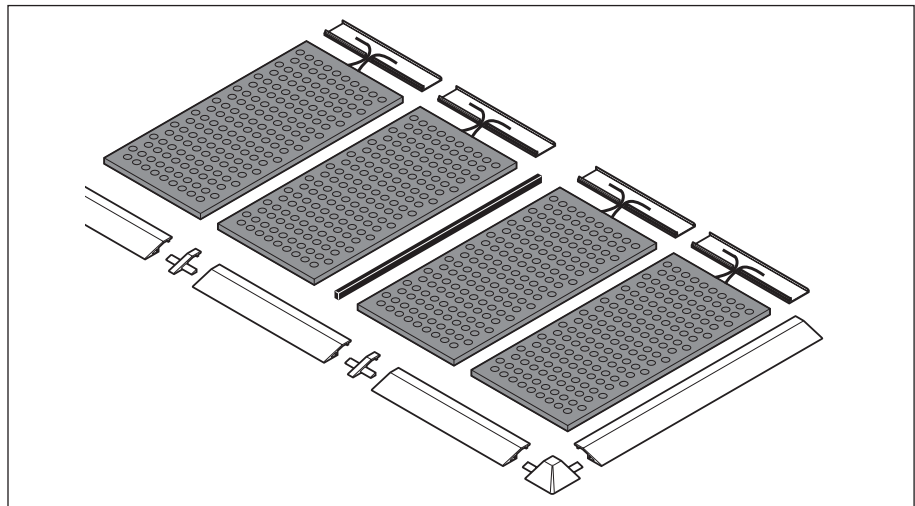


Fig. 5-1: Arrange Safety Mats and fixing rails

5.4 Installing cable conduits

Cable conduit AP 45

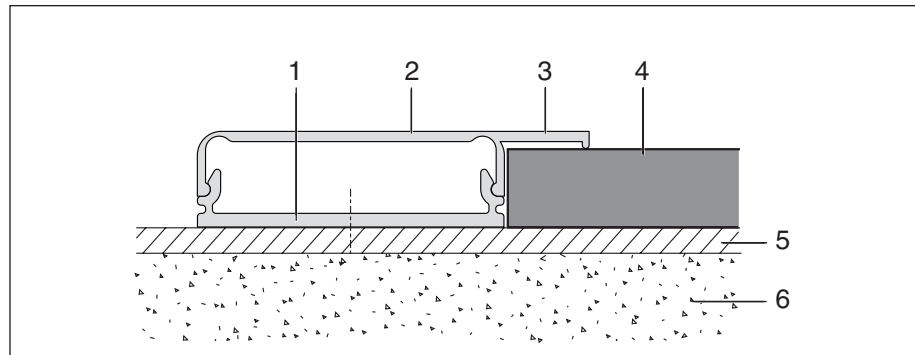


Fig. 5-2: Installation cross-section for cable conduit AP 45

- | | |
|--------------------------------------|---------------|
| 1 Lower section of the cable conduit | 4 Safety Mat |
| 2 Upper section of the cable conduit | 5 Plant floor |
| 3 Cover plate | 6 Screed |

Arranging cable conduits

Fixing cable conduits

1. Draw the line along which you want to install the cable conduits on the installation surface.
2. Arrange lower sections (1) of the cable conduits along the drawn line. Observe the following:
 - arrange cable conduits in accordance with the various Safety Mat widths.
 - the cut-out in the cable conduit for the cable must face in the direction of the Safety Mat (see Fig. 5-3, pg. 9)
3. Fix cable conduits to the installation surface by means of the oblong holes provided with plugs (Ø 6 mm) and screws (Ø 4 mm, length: min. 40 mm).
4. Remove drilling dust (for example with a vacuum cleaner), as otherwise the drilling dust could get under the Safety Mats and the ramp rails and lead to unevenness.

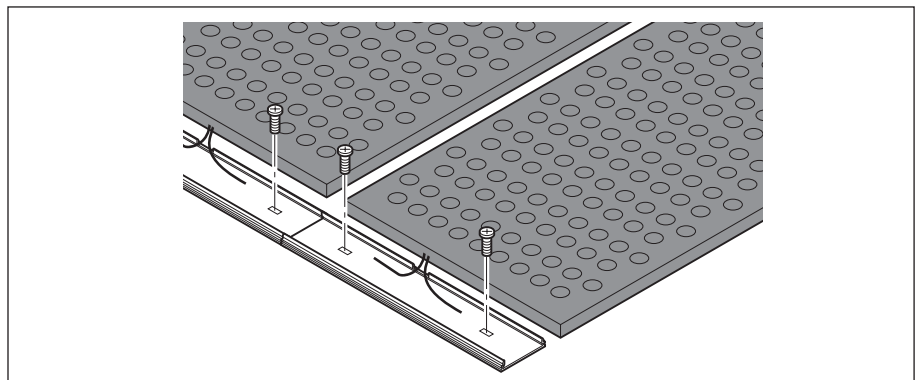


Fig. 5-3: Installing cable conduits



Do not yet fit upper sections of cable conduits!

5.5 Positioning the Safety Mats

1. Push Safety Mats as far as possible against the fitted lower sections of the cable conduits.
2. Place all Safety Mats edge to edge. Observe the following:
 - When installing separate wiring zones, place yellow filler strips at the relevant points between the Safety Mats.
 - Ensure that the distances between the Safety Mats are not more than 1 mm.
 - Do not compress or bend Safety Mats.
 - Arrange all cable exit sides in the same direction.

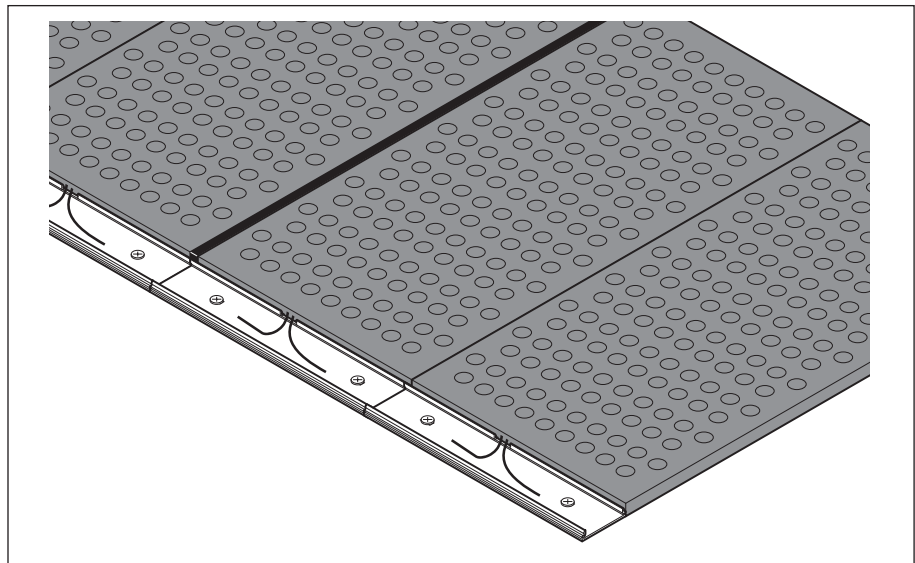


Fig. 5-4: Positioning the Safety Mats

5.6 Installing the ramp rails

Ramp Edge AK 56

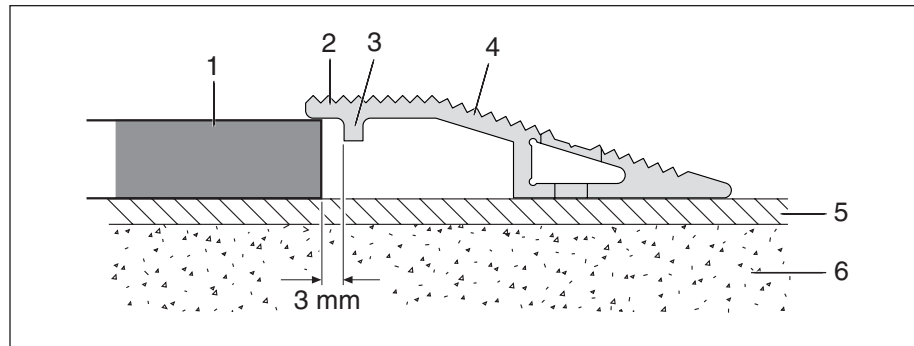


Fig. 5-5: Installation cross-section for Ramp Edge AK 56

- | | |
|---------------|-------------------|
| 1 Safety Mat | 4 Ramp Edge AK 56 |
| 2 Cover ridge | 5 Plant floor |
| 3 Stop ridge | 6 Screed |



Due to the heat expansion of the Safety Mats, the ramp rails must be installed at room temperature in such a way that an air gap of approx. 3 mm wide exists between the edge of the Safety Mat and the stop ridge (3) of the ramp rail, as otherwise the Safety Mats may arch at high temperatures.

Preparing Safety Mats and ramp rails

1. Mark the Safety Mats, for example with a ballpoint pen, at intervals of 2 mm from the outer edges of the Safety Mat system (see Fig. 5-6, pg. 11).
The ramp rails are aligned with these marks so that an air gap of 3 mm remains between the edge of the Safety Mat and the stop ridge (3) of the ramp rails.

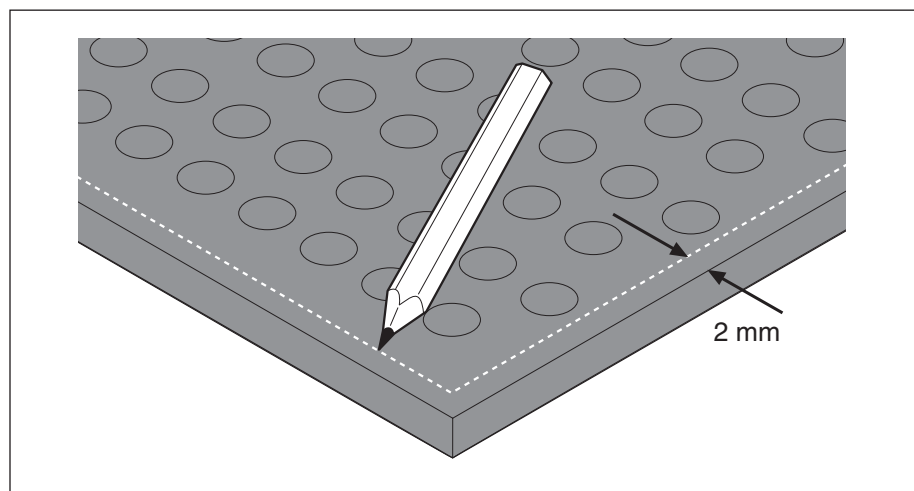


Fig. 5-6: Mark the edge of the Safety Mat

2. Fit ramp rails (4) together with the aid of the connecting wedges and corner connectors (see Fig. 5-7, pg. 12)

Positioning ramp rails

3. Place the assembled ramp rails against the Safety Mats and align the edges of the cover ridge with the marks.
4. Draw bore holes in the ramp rails on the installation surface.

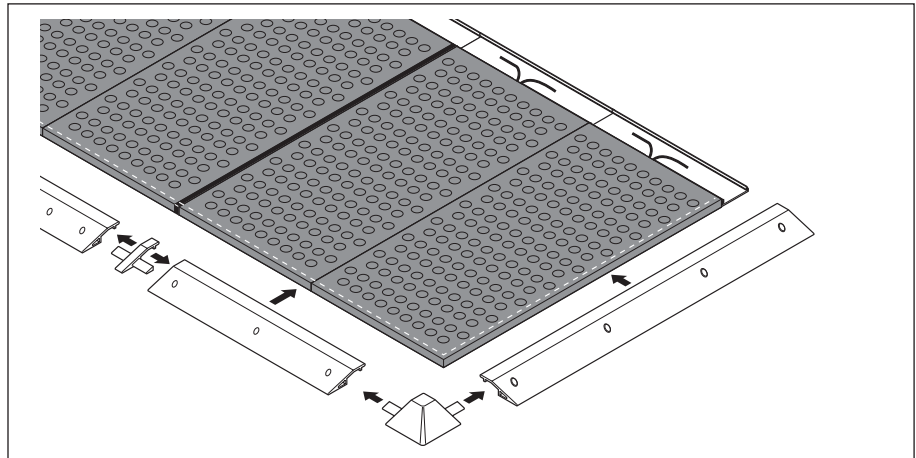


Fig. 5-7: Assemble and position ramp rails

Fix ramp rails

5. Push assembled ramp rails away from the Safety Mat system.
6. Drill bore holes at the places marked on the installation surface (\varnothing 6 mm, depth min. 40 mm) and insert plugs.
7. Remove drilling dust (for example with a vacuum cleaner), as otherwise the drilling dust could get under the Safety Mats and the ramp rails and lead to unevenness.
8. Place the assembled ramp rails against the marks on the Safety Mats again.
9. Fix ramp rails to the installation surface with screws (length: mind. 40 mm) (see Fig. 5-8, pg. 12)

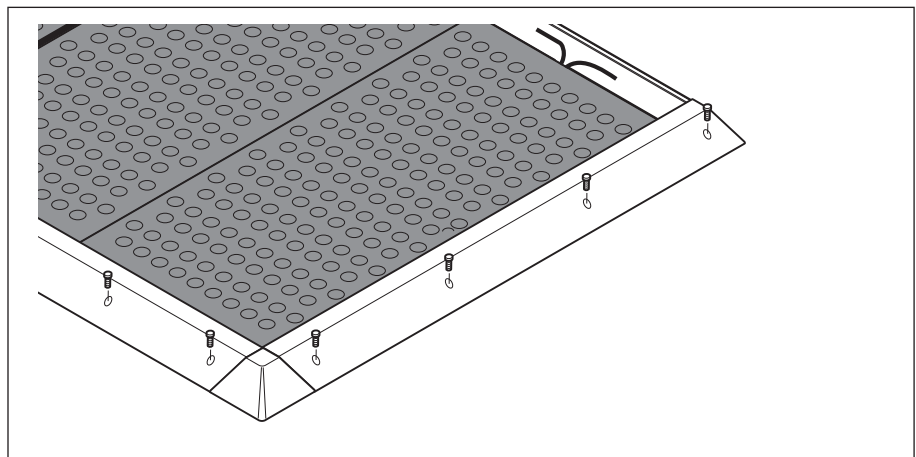


Fig. 5-8: Fix ramp rails

5.7 Laying cables

1. Connect Safety Mats to one another in accordance with the wiring diagram (see Fig. 5-9, pg. 13). Observe the following:
 - Connect cables of the Safety Mats via the flat plug and flat plug-in sleeves on the wire ends
 - Wire each zone separately and route the cables to a separate Control Unit.

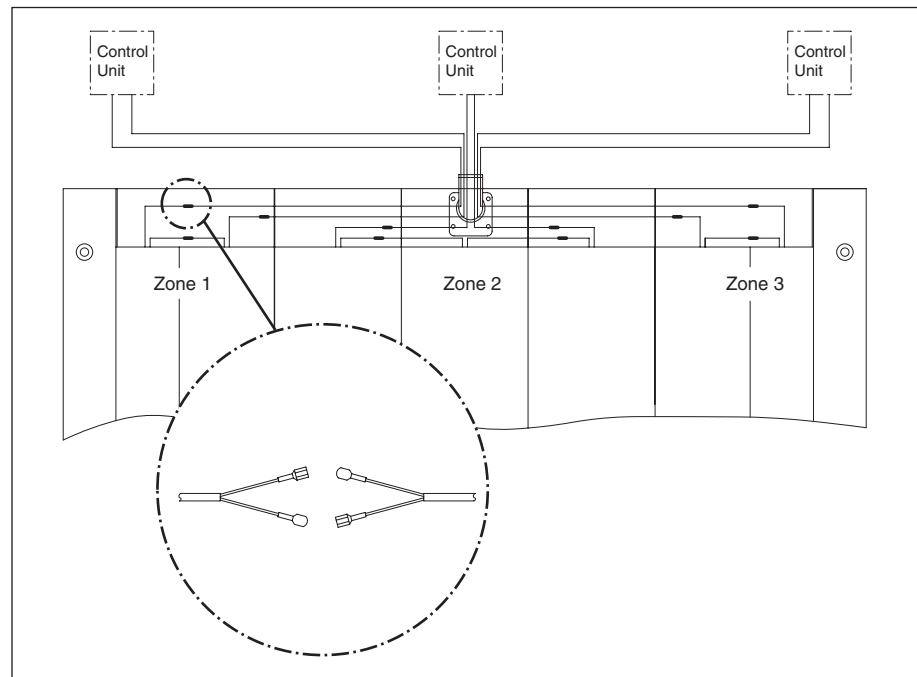


Fig. 5-9: Wiring diagram

2. Pull cable ends through the cable feed-through.
3. Lay cable in the cable conduits AP 45.
4. Fit the top sections of the cable conduits AP 45.

5.8 Test for function

Carry out the following actions for every cable of the Safety Mat system:

1. Set ohmmeter for measuring in a high resistance range.
2. Connect ohmmeter to the two wires of the cable.
3. Measure the electrical resistance between the wire ends with loaded and not loaded Safety Mat.

The measured resistance must have the following values:

- loaded (activated) Safety Mat system: < 150 Ω
- not loaded (not activated) Safety Mat system: > 1 MΩ

Test failed?

If the resistance measurement does not produce the necessary values, this may have the following causes:

- the cables of the individual Safety Mats are not correctly connected
- the cables are bent or damaged
- the Safety Mats are not lying flat on the floor

6 Maintenance and cleaning

The Safety Mats are virtually maintenance-free.

Cleaning

- ➔ Clean the surface of the Safety Mats at regular intervals using mild detergents.
- ➔ After cleaning, remove any remaining fluid.

Regular inspection

- ➔ Inspect Safety Mat surfaces for damage at regular intervals.
- ➔ Check safety function of the Safety Mats at regular intervals.

7 Disposal

The products included in the scope of supply contain the following materials:

Safety Mats

- plastics
- graphite (interior of Safety Mat, depending on version)
- aluminium (interior of Safety Mat, depending on version)
- copper (interior of Safety Mat, cables)

Installation accessories

- steel (screws)
- aluminium (ramp rails, cable conduits)
- plastics (connecting elements)

Packaging

- wood, cardboard, plastics

The following is to be observed when disposing of these materials:

- ➔ Observe all relevant national disposal regulations and statutory conditions.
- ➔ Provide the material list given above when using a disposal company.
- ➔ Recycle or dispose of materials in an environmentally friendly way.

