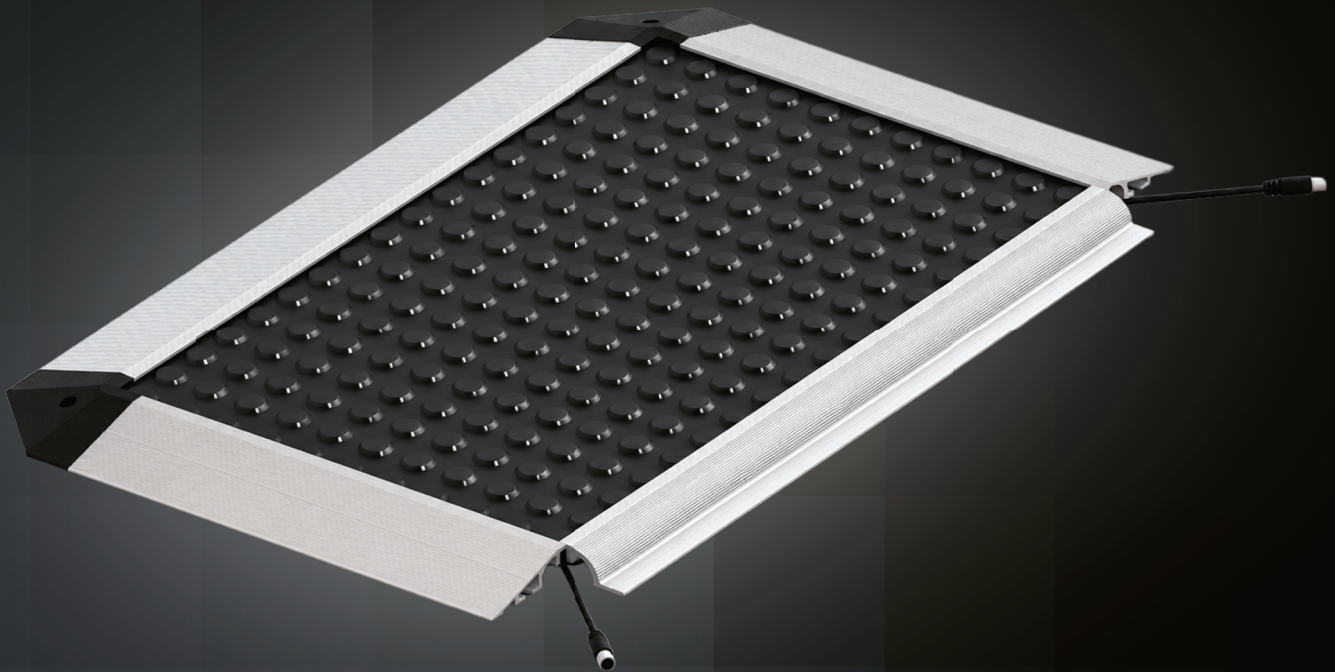
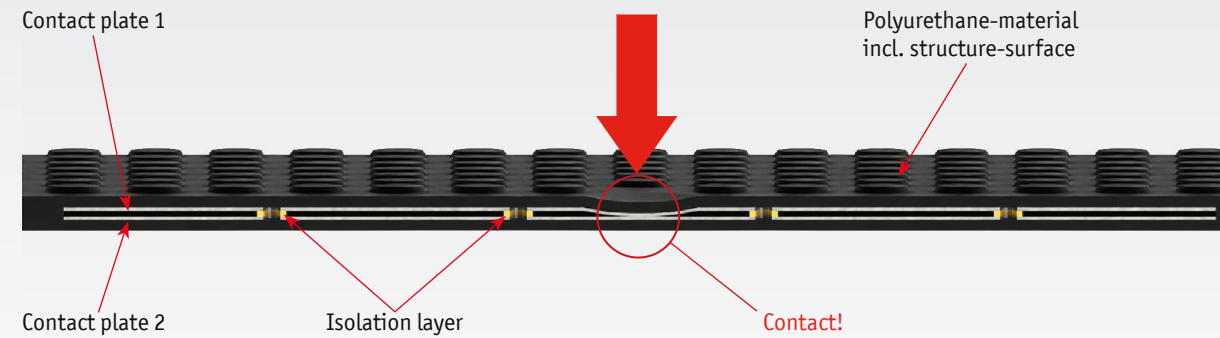


SENTIR® *bumat*



The principle of the safety-contact-mat

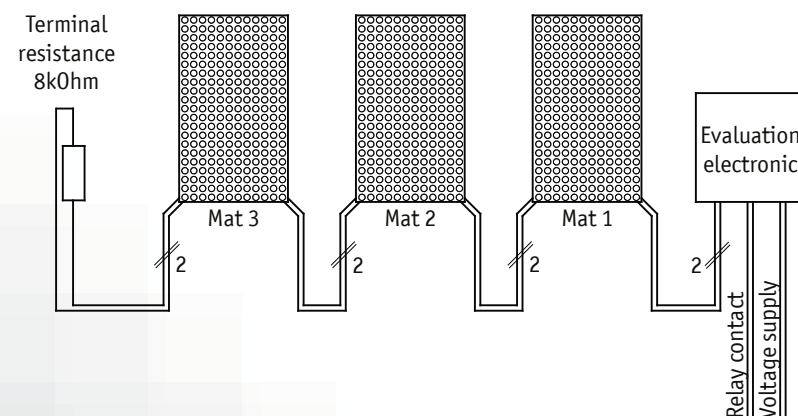


The structure

The basic construction of the ASO Safety Contact Mat consist of two conductive plates which are separated by a proprietary isolating layer. These plates are completely potted in a polyurethane material so that they are impervious to oil, water and dirt. The top consists of a slip resistant checkered pattern. This surface provides excellent resistance against oil and grease. Two cable exits are provided. These cables consist of one M8 male plug and one M8 female plug in standard construction (optional cable exits are available upon request). Mounting to the floor can be realized with optional aluminum ramp rails RS 14 or BS 14.

Signal processing

The SENTIR mat safety contact mat is fitted with 2 two-core connecting cables and offers the possibility of connecting several mats in series up to a maximum total area of 10 m². One end of the cable is connected to the safety evaluation control electronics and the terminal resistance is connected to the other end (prepared at the factory). The safety evaluation control electronics provides monitoring for the entire circuit including the cabling route and the mats, by monitoring the terminal resistance. The two surfaces of the mat make contact when stepped on and the resistance is bridged. This immediately causes a signal within the electronics that is then given as a potential free output for the contact-mat by the relay. The entire switching circuit is monitored at the same time for damage to cable or manipulation.



Please pay attention to:

- Up to 10 contact mats wired in series may be connected to one evaluation control unit. The maximum total area can not exceed 10m²!
- The total cable length can not exceed 25m.
- The 8.2 kΩ terminal resistance must be connected to the last mat in series when several mats are connected!
- Please inquire separately for mats with recesses or special shapes.

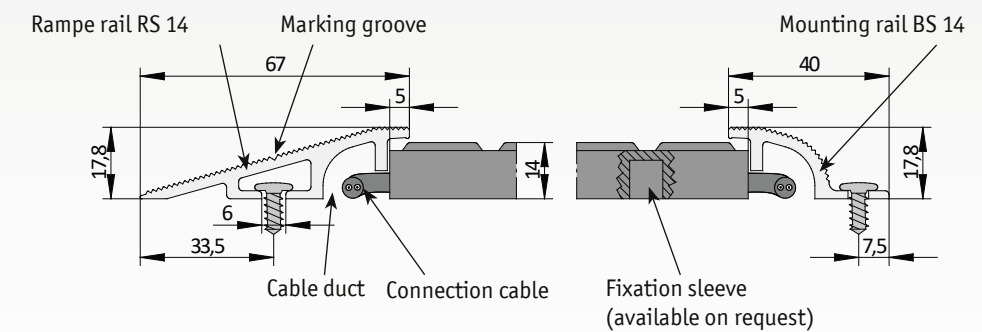
Ramp rail

The ramp rail RS 14 provides secure mounting capability for the safety contact mat. The angled design reduces tripping and slipping when mounted to the mat. The integrated channel can be used for clean and safe installation of the connecting cable.

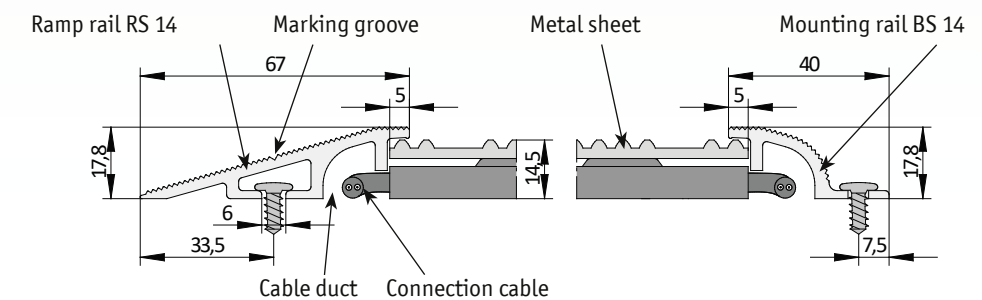
Mounting rail BS 14

The mounting rail BS 14 can be used to attach the safety contact mat in less accessible areas (for example at machines, shut-off positions, walls, etc.). Also the integrated channel can be used for clean and safe installation of the connecting cable.

SENTIR mat 14



SENTIR mat 14 ARB (SENTIR mat 14 TBV)



Fixation sleeve

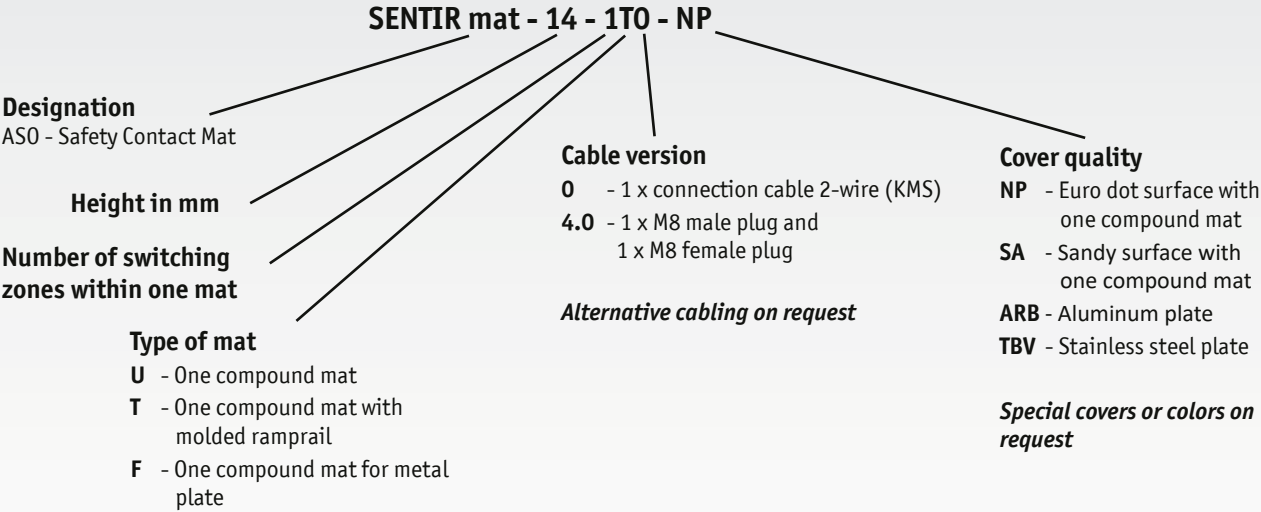
This enables the safety contact mat to be fixed to the floor without additional space being needed.

Covers

Special covers or colors on request.

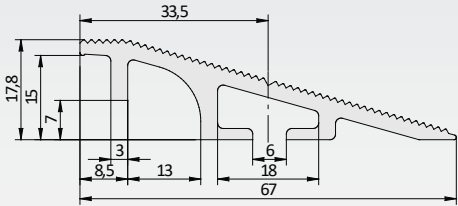
- | | |
|------------|---|
| NP | - Euro dot surface with one compound mat |
| SA | - Sandy surface with one compound mat |
| ARB | - One compound mat with aluminum plate |
| TBV | - One compound mat with stainless steel plate |

Type code information

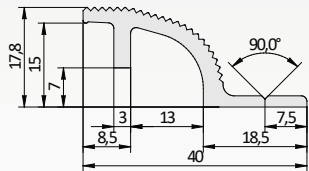


Technical specifications for equipment

Technical specifications ramp rail RS 14
Application: SENTIR mat 14
Articel-No.: 603001
Material: Aluminum AlMgSi 0,5
Standard length of delivery: 3 m
Weight: approx. 788 g/m



Technical specifications mounting rail BS 14
Application: SENTIR mat 14
Articel-No.: 603003
Material: Aluminium AlMgSi 0,5
Standard length of delivery: 3 m
Weight: approx. 411 g/m

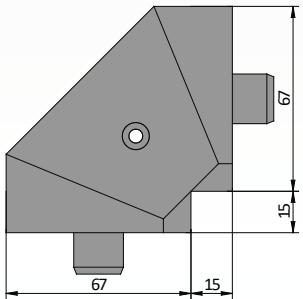


Technical specification for Safety contact mats

	SENTIR mat 14 U/ SENTIR mat 14 T	SENTIR mat 14 ARB
Max. dimensions	2000 mm x 1250 mm	2000 mm x 1250 mm
Standard dimensions available from stock	only SENTIR mat 14 U / T 1000 mm x 750 mm 1000 mm x 1000 mm 1000 mm x 1500 mm	
Construction height	14 mm with covering	14 mm with covering
Surface	Euro dot	checkered
Weight	U 24,9 Kg/m² ; T 26 Kg/m²	approx. 31,5 kg/m²
Inactive border	16/42 mm	30/40 mm
Switching pressure	Round body Ø 80 mm = approx. 150 N	Round body Ø 80 mm = approx. 150 N
Static load	max. 2000 N over Ø 80 mm *	max. 2000 N over Ø 80 mm *
Response time	< 25 ms *	< 25 ms *
Switching cycles	at least 1 million *	at least 1 million *
*Certificates	EN ISO 13856-1 EN ISO 13849-1 UKCA	EN ISO 13856-1 EN ISO 13849-1 UKCA
Electrical capacity	24 V 100 mA	24 V 100 mA
Material	PUR black, 78 +/- 5 Shore A	PUR black, 78 +/- 5 Shore A
Protection class	IP 65 (IP 67)	IP 65 (IP 67)
Temperature range	-10°C to +55°C	-20°C to +55°C
Chem. resistance:		Aluminium
Oil	good	good
Fuel	resistant	good
Solvent	sufficient	good
Acid diluted	resistant	good
Base diluted	resistant	good
Maintenance	The mat is maintenance free. Functional testing on an annunal basis is recommended.	
Connection cable	Standard: 2 pcs. - 2 x 0,34 PVC / PU cover black Ø 3,5 mm with M8 male/female plug 120 mm (4,72") Alternative: 1 pc. 4 x 0,25 PVC / PU cover black Ø 4,4 mm with open wires (BN: 1, BU: 3 WH: 2, BK: 4)	



Technical specifications corner connector EVA
Application: SENTIR mat 1
Articel-No.: 603020
Material: PA 6 30% DV, black
Weight: ca. 29 g/pcs.



Technical specifications checkered plate cover
Application: SENTIR mat 14 ARB
Articel-No.: 1600028
Material: Aluminum 2,5/4 mm, max. 2500 x 1400 mm
Weight: approx. 7,6 kg/m²



Aluminum checkered plate

Technical specifications bulb plate cover
Application: SENTIR mat 14 TBV
Articel-No.: 1600016
Material: Stainless steel 1,5/2 mm, max. 2500 x 1250 mm
Weight: approx. 11,6 kg/m²



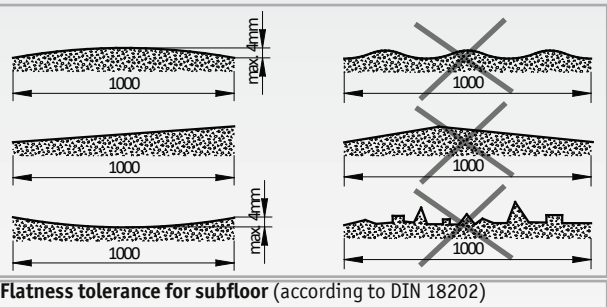
Stainless steel bulb plate



Assembly Information

The mounting surface must be absolutely even, clean and dry.
Mats may not be glued on the bottom.

Lay out and position the mat correctly with the base plate downwards. Mats may not be broken or bent. Safety-Contact-Mats may not be changed in any way. Cut outs or shortening is not possible.



Please note for measurement:

The ramp rail resp. the mounting rail are used for the fixation of the mat.

To calculate the necessary space needed for the mat, the additional size of the ramp rail(s) resp. mounting rail(s) has to be added to the dimension of the safeguarded area.

	Ramp rail	additional size	mounting rail	additional size
SENTIR mat 14	RS 14 Aluminum	62 mm	BS 14 Aluminum	35 mm
SENTIR mat 14 T	molded	30 mm	- / -	- / -
SENTIR mat 14 ARB	RS 14 Aluminum	62 mm	BS 14 Aluminum	35 mm
SENTIR mat 14 TBV	RS 14 Aluminum	62 mm	BS 14 Aluminum	35 mm

Available space for safeguarding:

Required Safety contact mat:

Example of calculation:

1200 x 500 mm

SENTIR mat 14 with ramp rail RS 14 and mounting rail BS 14

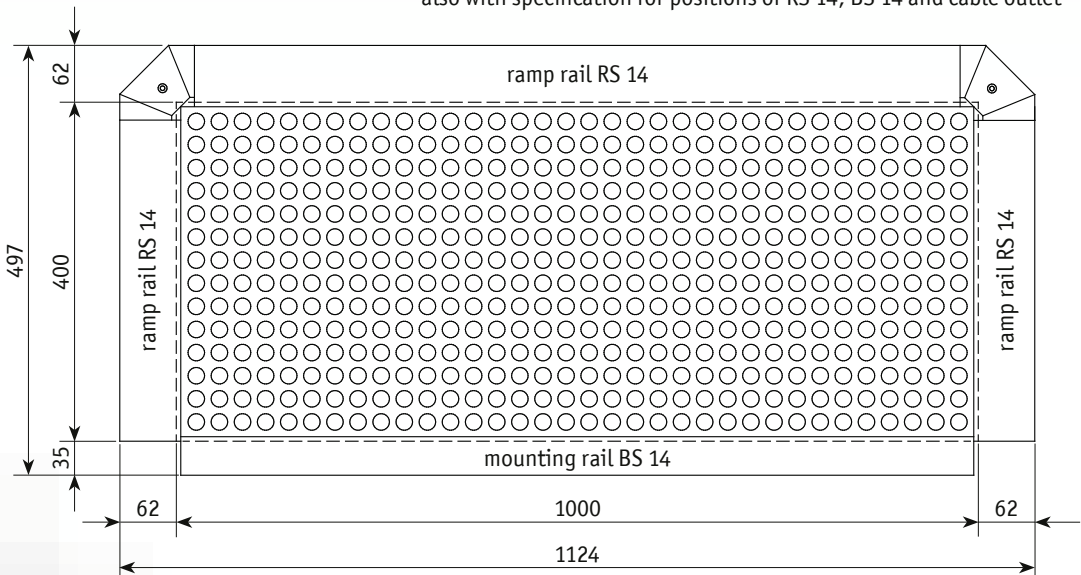
1200 mm - 62 mm - 62 mm = 1076 mm

500 mm - 62 mm - 35 mm = 403 mm

Ordering example:

SENTIR mat 14 1000 x 400 mm with RS 14 and BS 14

also with specification for positions of RS 14, BS 14 and cable outlet



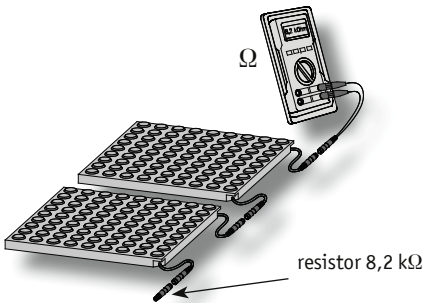
2000 mm x 1250 mm is the maximum producible size of a mat. All dimensions larger than this have to be realized by using several mats.

When installing several mats next to each other they are put together edge to edge.

Then connect the mats electrically and check the resistance value.

With not activated mat the value must be $8,2 \text{ k}\Omega \pm 500 \Omega$.

During cable laying inside the ramp- and/or in the mounting rail pay attention that the cable is not pinched.

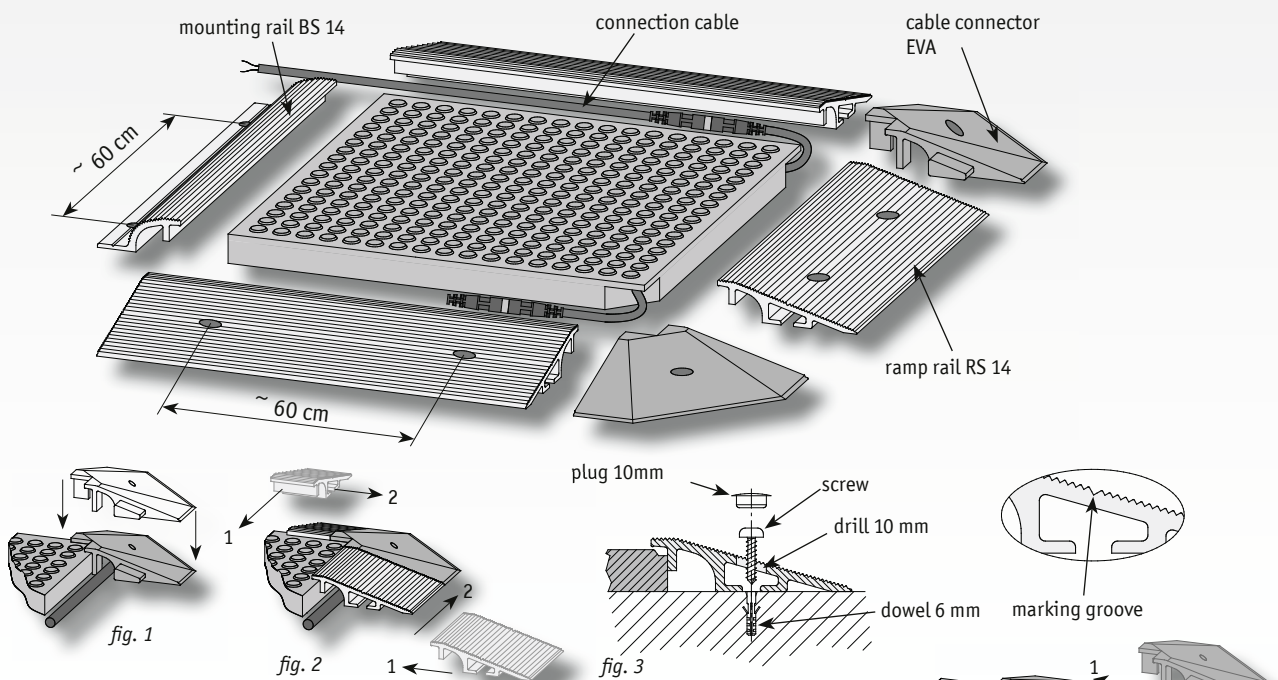


Assembly of SENTIR mat 14

When using corner connectors the ramp rail must be shortened around 20mm for each corner connector. The corner connector nearest the cable is to be mounted from above over the cable in such a way that the cable is guided safely in the cable duct (fig. 1). Afterwards drill and fasten it to the bottom with 6 mm dowel and suitable screw.

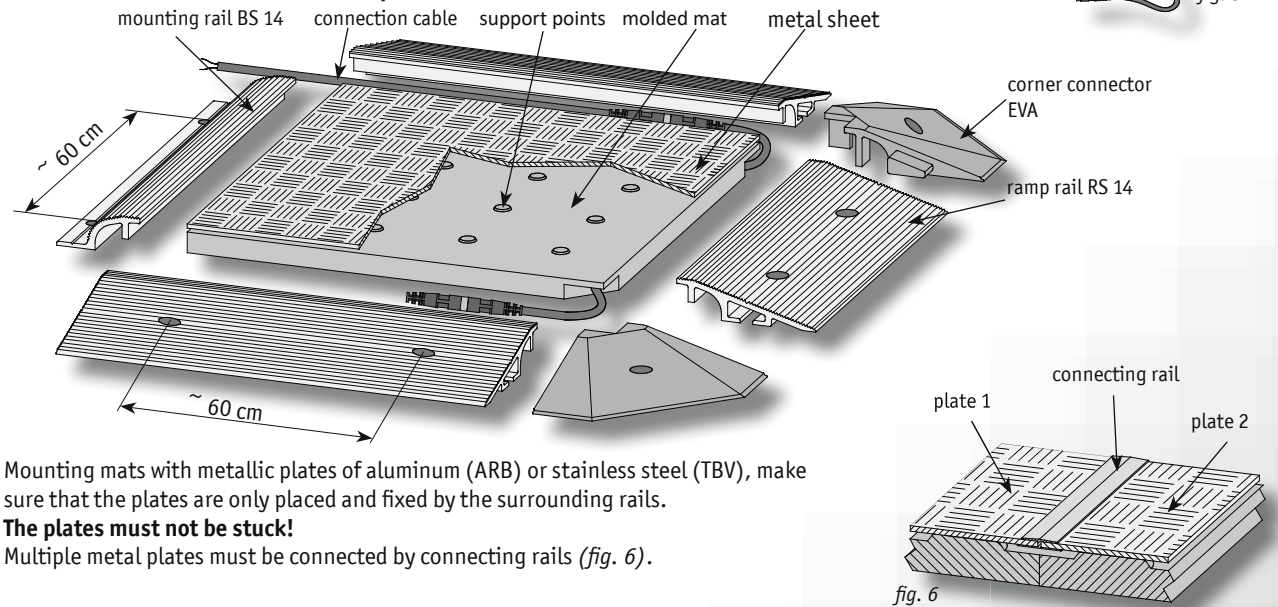
Push the ramp rails laterally to the mat and then on the fixation-pin of the corner connector (fig. 2). Mark the fastening points along the marking groove on the rail and pre-drill 10 mm for the intended plugs. Fasten the rails on the bottom with 6 mm dowels and suitable screws (approx. all 60 cm) and close the openings with the plugs (fig. 3).

Push the corner connectors laterally to the mat and then the fixation-pin into the rail (fig. 4). Afterwards drill and fasten it to the bottom with 6 mm dowel and suitable screw.



At the machine side the conclusion takes place via the adjustment with the mounting rail BS 14. Fasten the rail to the bottom with 6 mm dowels and suitable screws (approx. all 60 cm). If possible bring out the cable laterally and attach it to the controller (fig. 5).

SENTIR mat 14 ARB / SENTIR mat 14 TBV



Mounting mats with metallic plates of aluminum (ARB) or stainless steel (TBV), make sure that the plates are only placed and fixed by the surrounding rails.

The plates must not be stuck!

Multiple metal plates must be connected by connecting rails (fig. 6).

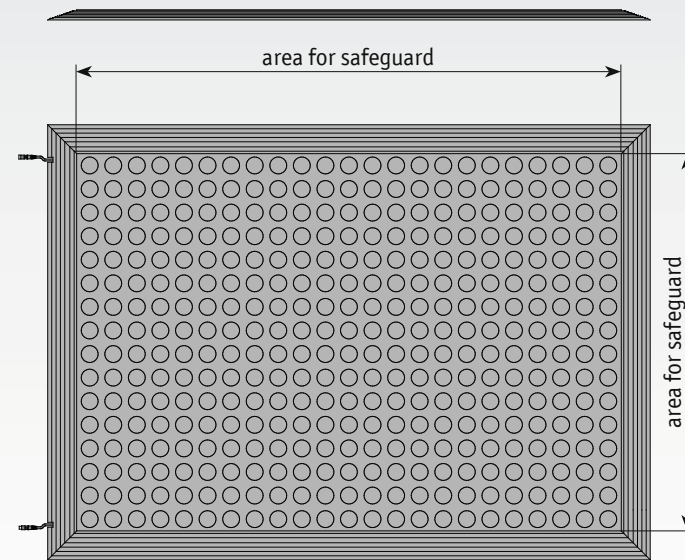
Assembly of mats with molded ramp rails SENTIR mat 14 T

Please note for dimensioning:

The area to be safeguarded is the dimensions of the mat without the ramp rails. Therefore 30mm have to be added for each ramp rail side. The result is the over-all dimension for the floor space.

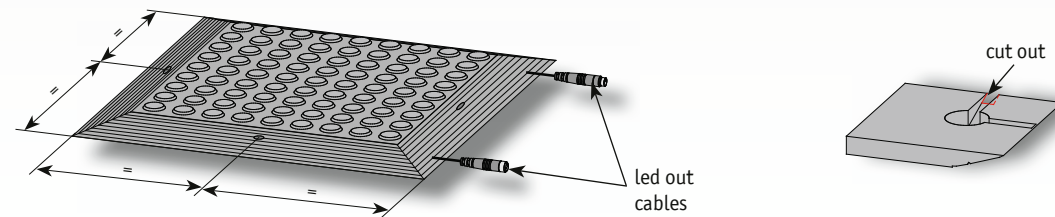
The ramp rail serves for fixation to the ground.

2000mm x 1250mm is the maximum producible size of a mat (area for safeguard). All dimensions larger than this have to be realized by using several mats.



Installation

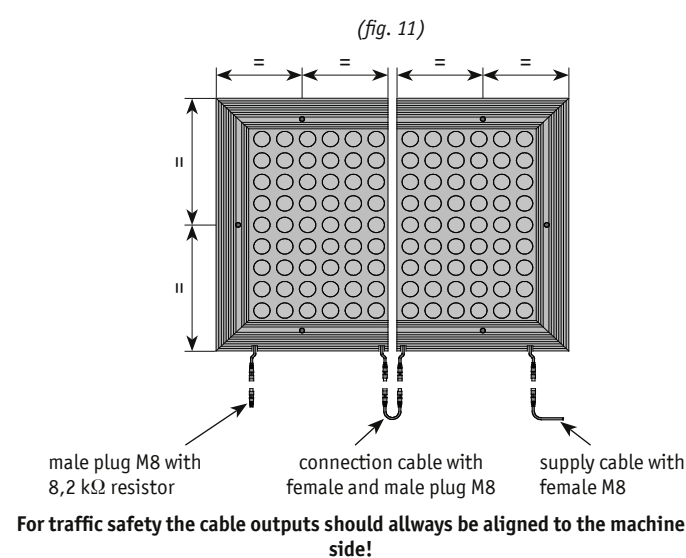
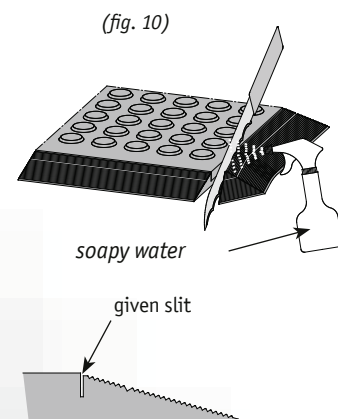
Cut out the cable output at appropriate side in that way that the coming out cables are not squeezed or sheared while placing the mat afterwards. Place and adjust the mat at appropriate place. To provide against slipping use suitable screws and dowels on each side of the mat.



When installing several mats next to each other they are put together edge to edge. To do this cut off the ramp rail with a knife in the given slit (spray the knife and the cutting area with soapy water (fig. 10)).

Adjust the mats and save each against getting out of place (fig. 11).

After that connect the mats electrically and check the resistance value. With not activated mat the value must be $8,2 \text{ k}\Omega \pm 500 \Omega$.

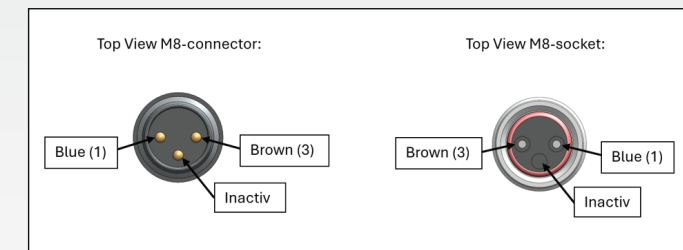


Unevenness and/or small inclusions of air which can appear on the back of the mat, do not affect the functionality of the SENTIR mat in a negative way. These kind of visual appearances are caused during the production process and can not be complained.

Function test

The SENTIR mat must be visually inspected for damage to the mat and for the integrity of the connecting cable.

Before starting the functional test, the SENTIR mat must be disconnected from the electrical current. A standard multimeter must be used for the test.



For the variant of the SENTIR mat featuring an $8,2 \text{ k}\Omega$ resistor, use a multimeter to measure the resistance between the M8 connector pins: Pin 1 (blue) and Pin 3 (brown). In all cases, polarity need not be observed.

In the unloaded, idle state, a resistance of $8,2 \text{ k}\Omega \pm 500 \Omega$ must be measured.

In the actuated state (a person is standing on the mat), a resistance of $<500 \Omega$ must be measured.

For the variant of the SENTIR mat without a resistor, use a multimeter in the unloaded state to measure the resistance between M8 connector Pin 1 (blue) and M8 socket contact 1 (blue), and between M8 connector Pin 3 (brown) and M8 socket contact 3 (brown).

In the unloaded, idle state, a resistance between 0Ω and $<50 \Omega$ must be measured.

In the actuated state (a person is standing on the mat), the resistance is measured once between the M8 connector pins: Pin 1 (blue) and Pin 3 (brown) and once between the M8 socket contacts: contact 1 (blue) and contact 3 (brown).

In the loaded state, a resistance of $<50 \Omega$ must be measured.

Damaged or defective devices must be replaced.



Storage

- SENTIR mats have to be stored dry ($-20^\circ\text{C} / +70^\circ\text{C}$)
- SENTIR mats have to be stored horizontally on a continuous even surface
- Do not stack more than 20 SENTIR mats on top of each other

UKCA Declaration of conformity

UKCA Declaration of conformity

In accordance with UK Government Guidance

ASO Safety Solutions

We hereby declare that the following products of sensing contact mat

SENTIR mat 10 / 10T
SENTIR mat 14 / 14T

satisfies the relevant UK Statutory Instruments and their amendments listed below on account of its design and construction, as does the version brought to market by us:

2012 No 3032
The Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

2008 No 1597
The supply of Machinery (Safety) Regulations 2008

Also, we declare that the product described above, to which this declaration of conformity refers to, is in conformity with the essential requirements of the following standards:

BS EN 12978+A1	Industrial, commercial and garage doors and gates. Safety devices for power operated doors and gates. Requirements and test methods
BS EN ISO 13849-1	Safety of machinery. Safety related parts of control systems General principles for design
BS EN ISO 13856-1	Safety of machinery. Pressure sensitive protective devices General principles for the design and testing of pressure-sensitive mats and pressure-sensitive floors

This declaration of conformity is issued under the sole responsibility of the product manufacturer.

Manufacturer and attorney of documents:

ASO GmbH
Hansastr. 52
D-59557 Lippstadt
Lippstadt, 11.04.2023



H. Friedrich
- Geschäftsführer - CEO - Gérant -



As of: 11.04.2023

Rev.:00

Page 1 of 1

UKCA Declaration of conformity

UKCA Declaration of conformity

In accordance with UK Government Guidance

ASO Safety Solutions

We hereby declare that the following products of sensing contact mats

SENTIR mat 14 ARB
SENTIR mat 14 TBV

satisfies the relevant UK Statutory Instruments and their amendments listed below on account of its design and construction, as does the version brought to market by us:

2012 No 3032
The Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

2008 No 1597
The supply of Machinery (Safety) Regulations 2008

Also, we declare that the product described above, to which this declaration of conformity refers to, is in conformity with the essential requirements of the following standards:

BS EN ISO 13856-1	Safety of machinery. Pressure sensitive protective devices General principles for the design and testing of pressure-sensitive mats and pressure-sensitive floors
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As of: 11.04.2023

Rev.:00

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