

Mounting and System Description for SSZ-Safety-Mats

SSZ-Safety-Mats

Further SSZ Products:

- Safety Switching Rails
- Safety Bumper
- Floor Switches
- Protection of shelving alleys PSA/P
- Protection of Fork-lift trucks PSA/S
- Special devices and developments

SSZ-Safety-Mats

Application

SSZ-safety-mats are areal protections with integrated sensor element and can only be used with controller Type **SSZ-AE-N**, **SSZ-SS-N**, **SSZ-SQ-N** and **SSZ-SQP-N**.

SSZ-safety-mats protect the dangerous working areas on machines and plants and prevent injuries or damage or reduce them to a minimum.

SSZ-safety-mats can be used where areas have to be protected. The safety mat/controller fulfils the requirements stage 2 (**SSZ-AE-N**) or the requirement stage 3 according to prEN 954-1.

Areas of Application

- for computer controlled devices
- for driverless floor conveying vehicles
- for dangerous areas within machines and units
- for protecting crushing points and cutting points and many more.

Types

SSZ-safety-mats are manufactured on customer demand. The maximum dimensions are 3000 mm x 1500mm. To protect a greater area it is possible to attach several **SSZ**-safety-mats.

Note

- the controllers are only allowed to be used in rooms with a minimum protection acc. to IP 54.
- the systems have to be checked by the user at least once per day to ensure that they function perfectly.
- the valid safety regulations and accident prevention regulations must be observed by the user.
- the controller can only be used in voltage circuits that comply with at least the same safety standards.

SSZ-Safety-Mats

Safety Category

The **SSZ**-controller type **SSZ-SS-N**, **SSZ-SQ-N** and **SSZ-SQP-N** apply with the safety category 3.

The **SSZ**-controller type **SSZ-AE-N** applies with the safety category 2.

Approvals

The **SSZ**-safety components are approved according to the above named safety categories for accident prevention.

The according "Baumusterprüfung" is held by the TÜV Hannover/Sachsen-Anhalt e.V.

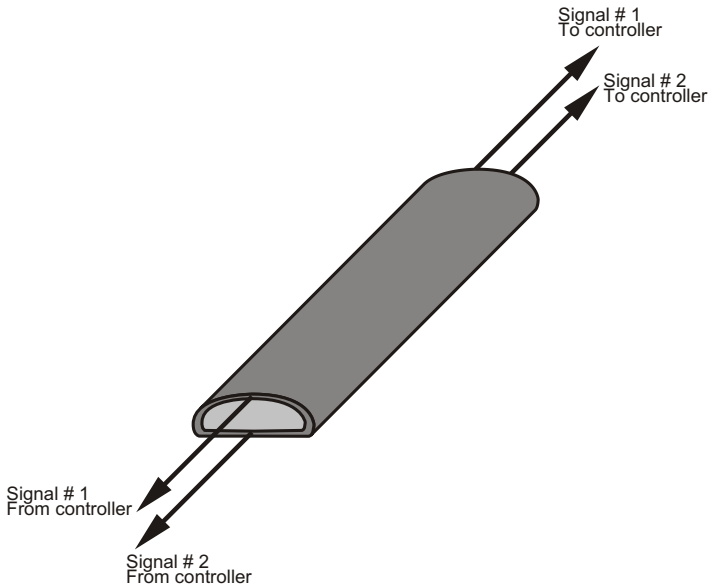
Important Note

The user has to take relevant measures to prevent independent starting after power cuts and starting an emergency stop facility acc. to VDE 0113 T1, 1986, para. 5.5.1.2.

SSZ-Safety-Mats

Like all **SSZ**-safety components, **SSZ**-safety-mats are constructed in a 4 wire system to ensure the highest safety standards.

The sensor element which is integrated into the **SSZ**-safety-mat, conducts 2 signals that are produced by the controller via the sensing area.



These signals are fed back to the controller via the 4 wire connection cable.

When the mat is actuated, the signal conducting contact areas touch each other whereby the signals change. This changing of the signals is transmitted to the output relays K1 and K2 in the controller. Hereby the relays contacts open.

This means that the emergency stop circuit of the machine in which the contacts are included, is interrupted and the dangerous movement is prevented.

SSZ-Safety-Mats

If there is any interruption (cable break etc.) in an individual wire in the connection cable or the signal transmitter, the controller no longer receives an appropriate signal. This is indicated by the extinction of one of the two yellow diodes.

By this the output relays K1 and K2 decline and the emergency stop circuit of the machine is opened.

At a crush-closing or the cutoff of the connection cable these two output relays also decline.

The switching condition of the relays is displayed via light emitting diodes (LED) on the controller. The function of the LEDs is shown in the following table.

| Name of the LED | Colour | Function |
|-----------------|--------|---------------------|
| Ub | red | operating voltage |
| RDY (K1) | yellow | signal on clamp 5 |
| ON (K1) | green | relais K1 tightened |
| OFF (K1) | red | relais K1 declined |
| RDY (K2) | yellow | signal on clamp 6 |
| ON (K2) | green | relais K2 tightened |
| OFF (K2) | red | relais K2 declined |

The **SSZ**-safety-mat as well as its connection cable are permanently controlled through this wiring and with the assistance of the controller.

SSZ-Safety-Mats

The **SSZ**-safety-mat is mounted to the appropriate part of the machine by the supplied aluminium edging.

The controller must be installed in the controlling housing, switch cabinet or the appropriate installation point.

After the safety-mat connection cables have been laid, these are connected to the controller.

The connection cable is fitted with wire marking and additional colour codes.

| Clamp on controller | Wire No./colour 1x4 plug | Wire No./colour 1x4 fixed |
|---------------------|-----------------------------|------------------------------|
| 3 | 3/ blue | 3/ green |
| 4 | 4/ brown | 4/ brown |
| 5 | 5/ black | 5/ yellow |
| 6 | 6/ white | 6/ white |

The wires labelled 3/4/5 and 6 definitely must match clamps 3/4/5 and 6 on the controller to ensure correct functioning.

The output contacts of relais K1, N.O. 13/14 or 23/24 must be connected in series with N.O. contacts 33/34 of relais K2 (on the type **SSZ-AE-N** contacts 11/14 K1 and 21/24 K2) so that a possible fault (sintering by overloading etc.) can be detected.

These contacts that are connected in series must now be included in the emergency stop circuit of the machine.

As long as the safety-mat is not activated these contacts and therefore the emergency stop circuit is closed.

The **SSZ-SQ-N** and **SSZ-SQP-N** controller are self locking units. This means that after actuating the safety-mat, the relais remain declined until an acknowledgement has been given via an external potential-free reset button.

The reset button is connected to the clamps S1 and S2.

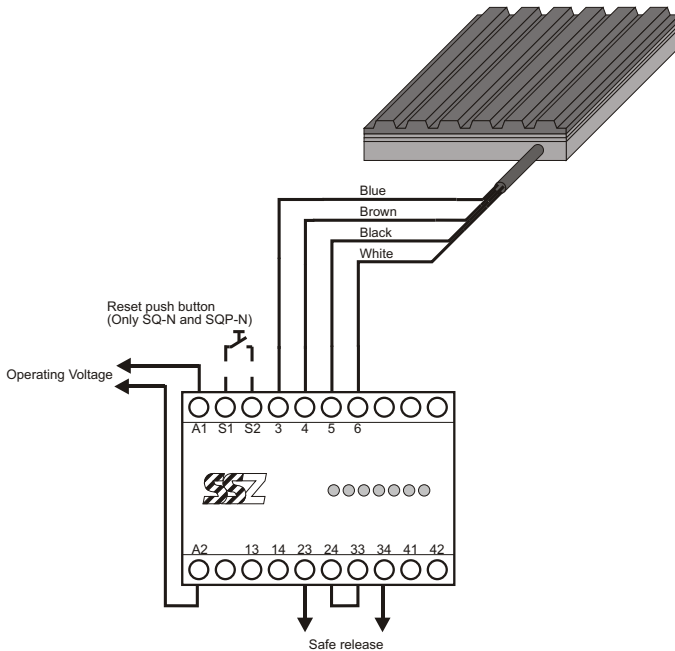
SSZ-Safety-Mats

The reset of the controller is done by falling edge. This means that the output relays do not resume working condition and the contacts do not close until the contact of the reset button has been opened.

Through this measure a by-pass off the reset button is impossible.

At last the operating voltage should be connected to the clamps A1 and A2.

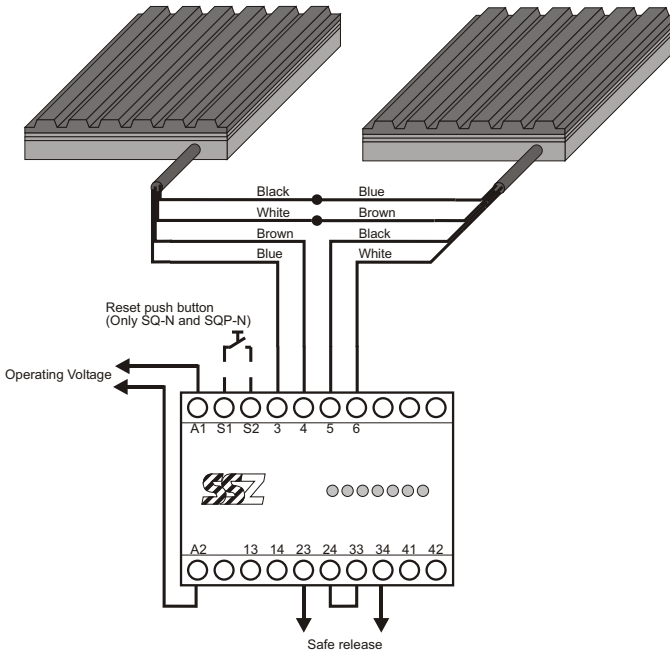
After this the **SSZ**-safety-mat should be checked by several activations.



SSZ-Safety-Mats

If two or more **SSZ**-safety-mats are connected to a controller they have to be connected in series.

Please pay attention to the following connection diagram on the tables on the following page.



SSZ-Safety-Mats

Table for connecting two SSZ-safety-mats:

1 x 4 wire connection cable with 4- pole plug

| | Wire no./ colour | Connect to |
|--------|------------------|----------------------|
| Mat #1 | 3/ blue | Controller clamp 3 |
| | 4/ brown | Controller clamp 4 |
| | 5/ black | Mat #2 wire 3/ blue |
| | 6/ white | Mat #2 wire 4/ brown |
| Mat #2 | 5/ black | Controller clamp 5 |
| | 6/ white | Controller clamp 6 |

1 x 4 wire fixed connection cable

| | Wire no./ colour | Connect to |
|--------|------------------|----------------------|
| Mat #1 | 3/ green | Controller clamp 3 |
| | 4/ brown | Controller clamp 4 |
| | 5/ yellow | Mat #2 wire 3/ green |
| | 6/ white | Mat #2 wire 4/ brown |
| Mat #2 | 5/ yellow | Controller clamp 5 |
| | 6/ white | Controller clamp 6 |

SSZ-Safety-Mats

The function test of the **SSZ**-safety mat:

The **SSZ**-safety mat can be tested with help of multi gage or an electric resistance meter.

For a function test the mat has to be disconnected from the controller and other connected safety components.

The measuring points and results are listed in the following table.

| Connection point | Measuring range | Measuring result |
|--------------------------------------|-----------------|------------------|
| Wire 3/ Wire 4 Wires 5/ 6 open | 20 M Ohms | |
| Wire 3/ Wire 4 Wires 5/ 6 shorted | 400 K Ohms | <280 K Ohms |
| Wire 3/ Wire 5 | 200 K Ohms | <140 K Ohms |
| Wire 4/ Wire 6 | 200 K Ohms | <140 K Ohms |

The resistance between wire 3 and wire 5 should have approximately same value as the resistance between wire 4 and wire 6.