

1. Safety instructions

Please read these instructions carefully and completely before installing and starting to work with this unit. The manufacturer cannot be held liable for damage resulting from use contrary to the designated purpose.

- The glass breakage sensor is intended for indoor installation only.
- The glass breakage sensor must not be modified or changed.
- The glass breakage sensor must not be connected to 230 V AC mains voltage.
- The glass breakage sensor must only be operated in the specified temperature range.
- Installation, programming, maintenance and repair works must be carried out only by authorized trained persons.

2. General information

The active glass breakage sensor MAGS-S with integrated alarm memory is used in intrusion detection systems for monitoring glass breakage. It consists of an evaluation unit and one or two sensor pairs (transmitter and receiver). The detector requires no adjustment to adapt it to the glass surfaces. All calibration and gain settings are made automatically.

It is only necessary to add here the Sensors (transmitter and receiver) to the glass pane and connect the wires to the evaluation unit. After the operating voltage is connected, the detector adjusts itself automatically. Since the "MAGS-S" adjusts automatically to the pane of glass, even significant changes in the glass or frame construction due to environmental influences such as cold, heat, aging etc. do not lead to errors.



The active glass breakage sensor "MAGS-S" can only indicate glass breakage that falls within the spectrum of its physical mode of operation.

Active glass breakage detectors monitor for climbing or reaching through, but not for tools which pass through the glass. Therefore they are not suited for monitoring glass panes and enclosures in jewelry Stores, watchmaker Shops and similar situations if jewelry, precious stones or metals, medals, pearls and other valuables are to be protected.

Special Features

- Simple assembly and commissioning - no adjustments required.
- Automatic recognition of glass types (no interference through changing ambient conditions such as temperature, ageing, etc.).
- Transmit and receive sensors are interchangeable (transmitter can operate as a receiver and vice versa).
- Same transmitter and receiver for all types of glass.
- Small sensor housing dimensions.

3. Function

Depending on the glass surface to be monitored and its characteristics, monitoring is performed by two Sensors connected to an evaluation unit. During normal operation, the active glass breakage sensor transmits a frequency to the receiver. If the glass breaks, the signal propagation delay and amplitude of the reflected Signal changes within a certain time interval. The evaluation unit detects this condition and triggers an alarm, setting the alarm memory and indicating with LED3. The housing of the evaluation unit is monitored for opening by a cover contact.

4. Monitored instances of interference / tampering:

- Incorrect operating voltage and/or malfunction of the glass-break sensor.
- Disconnection or shorting out of the sensor.
- Tamper by means of interfering electrical Signals.
- Damping of the glass surface being monitored.
- Application of foil.
- Dirt on the glass pane with automatic readjustment of the sensor.

5. Glass types which can be monitored:

The MAGS-S can be used anywhere for monitoring the following types of glass.

- Window glass
- Crystal glass
- Tempered glass
- Insulation glass
- Bullet-proof glass
- Wire-reinforced glass
- Laminated glass
- Safety glass with or without pre-stressing

6. Mounting

Requirements

All glass surfaces to be monitored must be incorporated in rigid frame constructions. The panes must not be cracked or have other damage. The detector side of the glass must be flat. Installation on plastic panes is not possible.

It should be ensured that the setting blocks for the panes are properly inserted and that there are no loose particles of glass in the glazing rebate (these may cause false alarms). In the case of glass panes with metal framing, direct contact between the glass and the metal must be avoided.

Installation

The installation location for the evaluation unit should be chosen such that the memory LED remains visible.

In normal operation, terminal 13 (reset) is to be wired to OV/GND (relay or transistor output). To reset the alarm memory, this connection must be interrupted for at least three seconds.



If the PCB is removed from the lower part of the housing, care must be taken not to damage the auxiliary board located under it or its connections (equalize the potentials).

Application test

The transmission characteristics of glass surfaces depend heavily on the type of glass, its thickness, geometry and the frame. Therefore it is urgently recommended to perform a preliminary test of the transmission characteristics. To do this, the adhesive pads included with the package are applied to the glass pane as shown in Figures 1 and 2. It should be ensured that the surfaces to which they are applied are clean and free of fatty substances. The surfaces should be cleaned before hand with alcohol if necessary. Afterward the sensors are to be pressed firmly onto the adhesive pads. After the sensors are connected to the evaluation unit and the operating voltage is applied, the voltages must be measured at reading point 1 as described in Section 9.

If the test is successful, the sensors must be removed carefully from the adhesive pads. First mark the position of the sensors. Then remove the adhesive pads and clean the points of attachment as described in Section 7 and install the sensors permanently at exactly the same position.



Only the adhesive pads provided should be used for the application test.

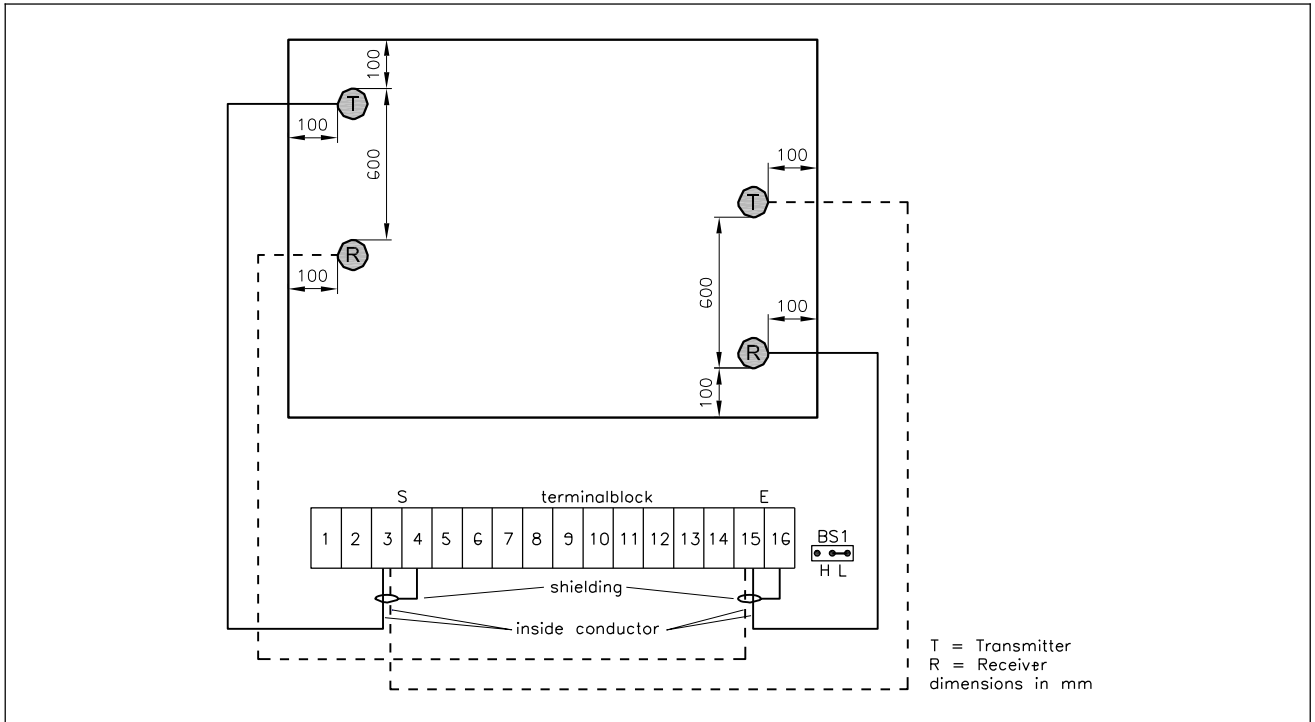


Figure 2 Mounting and connect with 2 pairs of sensors

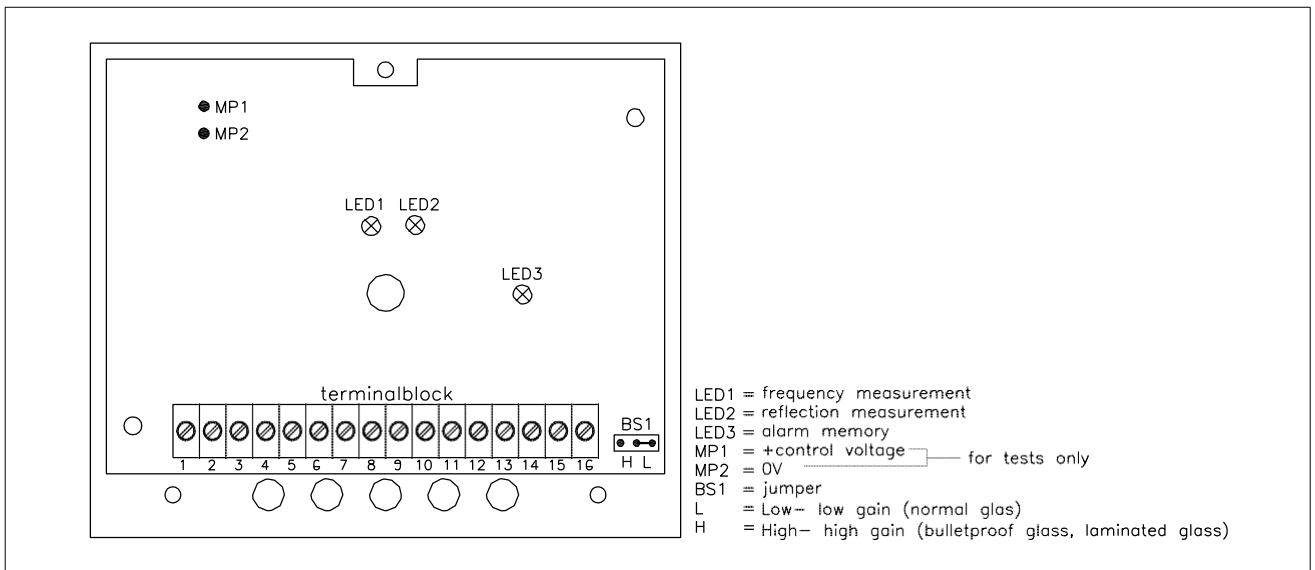


Figure 3 Evaluation unit, position of components

7. Glue instruction

In order to ensure that the signal from the transmitter reaches the receiver without difficulty, it is absolutely critical that the application of adhesive be done properly.

The glass-metal bonding kit Loctite 319 (Item no. 055260; adhesive 319 with activator 7649) is to be used for attaching the transmitter and receiver. The work is to be done only as described in the instructions below.

- The glass pane, transmitter and receiver must be clean, free of grease and completely dry.
- Clean the glass pane, transmitter and receiver thoroughly with acetone or cleaning spray (the cleaning agent for Loctite 70636AC is recommended – it even removes silicone). Do not exhale in the direction of the attachment point.
- Apply the activator to the pane of glass and allow it to deair completely (this takes a few minutes).
- Apply a drop of adhesive to the unactivated attachment surface of the transmitter or receiver.
- Place the transmitter and receiver diagonally on the activated glass pane with approximately 10 cm spacing from the edge of the frame, and apply medium pressure for about 30 seconds without twisting.

At a room temperature of +22°C (ideal temperature), the bonding point is fully set after approximately three hours. Lower temperatures require longer curing time for the adhesive.

Excess activator can be removed from the glass after setting (use only acid-free solvents).



At temperatures below +15°C, no work with the adhesive should be performed, as the adhesive will not cure properly and this may lead to false alarms!

It is important to pay attention to the expiration date of the adhesive kit. Adhesive that is past its expiration date must not be used. It is to be disposed of properly.

Use the bonding jig MAGSKL to achieve the best bonding results for the transmitter and receiver. This jig is designed to maintain the proper distance between the transmitter and the frame automatically. The bonding jig ensures that even pressure is maintained on the transmitter or receiver at the start of the adhesive curing process.

8. Use of the MAGSKL glue jig

- Loosen the press nut on the glue jig, set the desired cable exit position and apply pressure to the receptacle to compress the pressure spring, then tighten the press nut.
- Place the transmitter or receiver in the receptacle provided for it.
- Clean the bonding surfaces (glass, receiver, transmitter) with acetone or a similar cleaning agent (see the bonding instructions).
- Dry the bonding surfaces completely using a clean, dry cloth (see the bonding instructions). Apply the activator to the glass pane and distribute it evenly.
- Apply a small drop of adhesive to the attachment surface of the transmitter or receiver and distribute it evenly (apply a layer of adhesive approx. 0.2 mm).
- After the activator has evaporated, position the bonding jig and press it evenly on the glass pane. The three suction cups ensure secure seating of the bonding jig.
- If the bonding jig is in the desired position, loosen the press nut. The sensor will be pressed against the glass pane by the pressure spring. The curing process will start with evenly distributed pressure. After approx.
- 3 minutes, the bonding jig can be removed as follows:
- Retract the pressure spring by raising the guide pin and tighten the press nut again. Remove the sensor receptacle without twisting or tilting the sensor.
- Move the individual suction cups with your finger until the bonding jig can be removed.
- Excess activator residue should be removed only after curing is completed (See the bonding instructions). Wiring can be run as soon as the bonding jig has been removed.

9. Calibration and testing instructions

9.1 Calibration

The transmission quality from the transmitter to the receiver is influenced by many factors.

The DC voltage at measuring point 1 (MP1), which should be monitored during the automatic calibration, is a measure of the transmission quality. The lower this voltage is, the better the transmission quality.

The procedure below is to be followed for determining the correct setting for the BS 1 jumper.

1. After the operating voltage is applied, remove the BS 1 jumper and wait about 30 to 40 seconds until the alarm memory is set and LED 3 is lit.
2. Since in most cases the glass types are unknown, start with the gain setting "L", i.e. set the BS 1 jumper to "L". If the memory clears after approx. 30 seconds, then the gain is sufficient for that glass pane. The voltage reading must be < 4,5 V.
3. If the voltage reading is not as specified in (2), then the BS 1 jumper should be set to "H". If the memory can be cleared after 30 seconds, the measured voltage should also be < 4,5 V. If the memory cannot be cleared after 30 seconds, then the transmission is considerably inhibited, and you should proceed according to (4).
4. In the case of extreme damping effects from the glass (such as laminated or bullet-proof glass), two additional sensors should be bonded to the pane and connected to the evaluation unit as shown in Figure 2. If the memory can be cleared after 30 seconds, the measured voltage should also be < 4.5 V. If clearing is not possible or the voltage is greater than 4.5 V, it cannot be ensured that the detector will work properly.

Note

An optimization, i.e. further lowering of the measured voltage, can be achieved by removing the BS 1 jumper, waiting 15 to 20 seconds, then replacing it at the same position. This forces recalibration of the detector, which may find an even better transmission setting. This procedure can be repeated multiple times.

9.2 Testing

Choose "MAGS S" at the testing device GP 2 by pressing the button in the middle until the led lights up. Press the transducer about 5 cm beside the receiver plane onto the glass. While LED 1 is on, even LED 2 and LED 3 will light up. The relay breaks. LED 3 will light until the alarm memory is reset as it is described. The relay will stay in breaking position until manual reset. If the signal level is too low in case of massive laminated glass or bulletproof glass, it can be amplified by starting the test and at the same time flick a coin onto the glass. Delay between both signals should be max. 1-2 s (press GP2`s transducer on the glass, press "Test" and then flick the coin on the glass when LED 1 lights up.)

Sequence: 1. Frequency (LED 1 lights up),
2. Reflection (LED 2 lights up)

LED designation:	BS 1 setting:
LED 1 = frequency measurement	L = LOW (low gain)
LED 2 = reflection measurement	H = HIGH (high gain)
LED 3 = alarm memory	

10. Description of the test generator GP 2

The test generator GP 2 is an multi purpose testing device, that means, beside MAGS S, it is also suitable for passive glass break detectors. That`s why it is important to select the right detector type on the testing device. At the test there will be specially defined signals sent to he glass. If you test the active glass break detector with setting "MAGS 2" or "PGM", no reliable statement can be given about safe functionality of the system, even if you could trigger an alarm in this way.

The LED beside the "TEST" button gives information about battery status (green= battery okay, red= change battery).

MAGS-S - VDE6:9912400013

VANDERBILT

Active mini glass - break – sensor VdS-Nr. G 188149

Directions for use and installation

11. Technical data

Operating voltage range:	10.4 V ... 15 V DC	
Rated operating voltage:	12 V DC	
Current consumption: without transmitter/receiver with transmitter/receiver	idle 18 mA 22 mA (Power-on current approx. 28 mA)	alarm current 26 mA 18 mA
Temperature range	transmitter/receiver: -40 °C ... +85 °C evaluation unit: -10 °C ... +75 °C	
Output:	KI 14 at alarm -UB (0 V) maximum load 20 mA (tableau control) KI 9 - 12 potential free relay contact (opener)	
Input:	KI 13 -UB (0 V) put on with reset switch, reset with cut off and switch on again from 0 V on KI13, contact opening time Reset \square 3 sec.	
Cable length:	6 m (alternative 10 m)	
Cable diameter:	approx. 1,8 mm	
Colour (Sensor):	white, brown	
Colour (Evaluation unit):	white	
Dimensions	transmitter/receiver: \varnothing 14 mm x 6 mm evaluation unit: ca. 110 mm x 90 mm x 30 mm	
environment: evaluation unit sensors	II III	
VdS approval:	G 188 149 / VdS-class C	

12. EC Declaration of Conformity

Hereby, Vanderbilt International (IRL) Ltd declares that this equipment is in compliance with all relevant EU Directives for CE marking. From 20/04/2016 it is in compliance with Directive 2014/30/EU (Electromagnetic Compatibility Directive).

The full text of the EU declaration of conformity is available at:

<http://pcd.vanderbiltindustries.com/doc/Intrusion-accessories>

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