

Acoustic Glass Break Detector AD 700

Installation Manual

Rev. 060222

Description

AD 700 is an acoustic glass break detector giving an alarm when glass is smashed at intruder attempts through windows, doors and glazed walls.

The detector is based on advanced microcontroller technology and programmed to take a lot of relevant acoustic factors into account: the Digital Room Compensation (DRC). This makes the detector able to distinguish between a true glass break and other irrelevant sounds.

The detector is for indoor use.

The coverage distance is 1–9 m. The coverage angle is 165°, which means that one detector can protect several windows in the same room.

The detector can be mounted in the ceiling or on a wall with a free “line of sight” to the window being protected.

Types of glass and window constructions

The detector can be set to protect different types of glass and window constructions: single, double and multi-glazed panes of float (standard), tempered, laminated and glass covered with security film.

The panes should measure minimum 30x30 cm and maximum 300x600 cm with a maximum glass thickness of 6,0 mm.

Connection to a 24-hour loop

The detector is constructed for continuous supervision and it is extra resistant to different acoustic disturbances. It will function well in most environments. However in rooms with very high rates of disturbances as in industrial workshops and gyms, it is recommended to test the detector for 3-4 weeks before deciding to use it continuously. In rare cases a combination of random sounds can trigger an alarm.

Special tools

In most rooms such as normal offices it is not necessary to use any special tools at the installation.

In rooms with more complicated acoustics we recommend to use the tester ADT 700.

The ADT 700 is also used afterwards for function test and annual service.

Select the best place for the detector

Choose a place:

- in a ceiling or on a wall opposite to the glass to be protected
- where the “microphone” of the detector has a clear “line-of-sight” to the glass
- within a distance of 1–9 m from the glass to be protected
- minimum 50 cm from a corner
- minimum 1 m over the floor
- minimum 30 cm from the ceiling (at wall mounting)

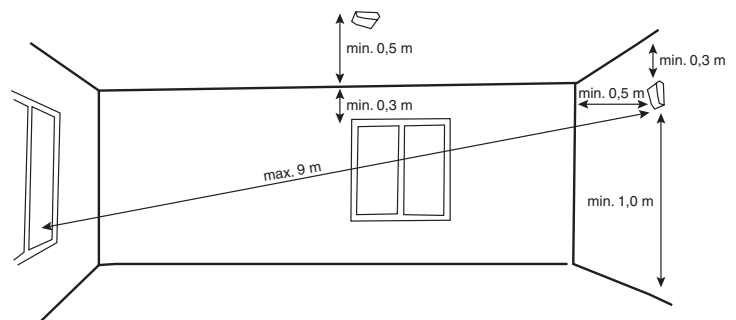
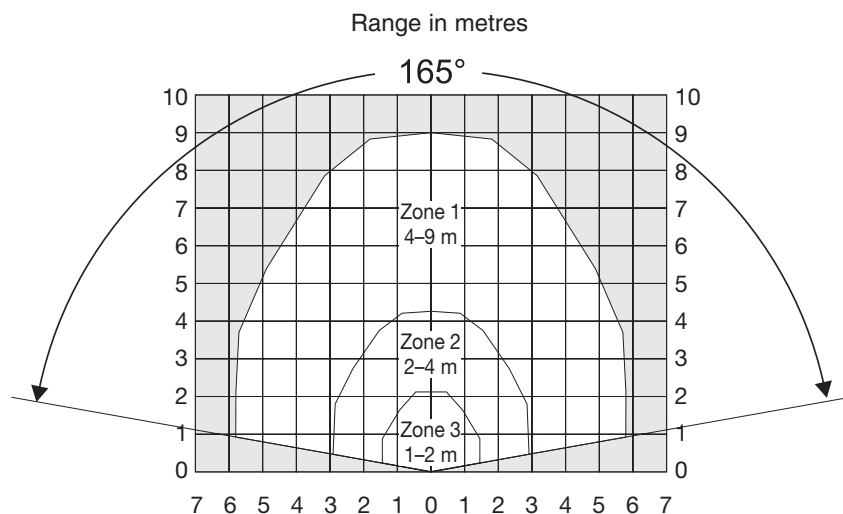
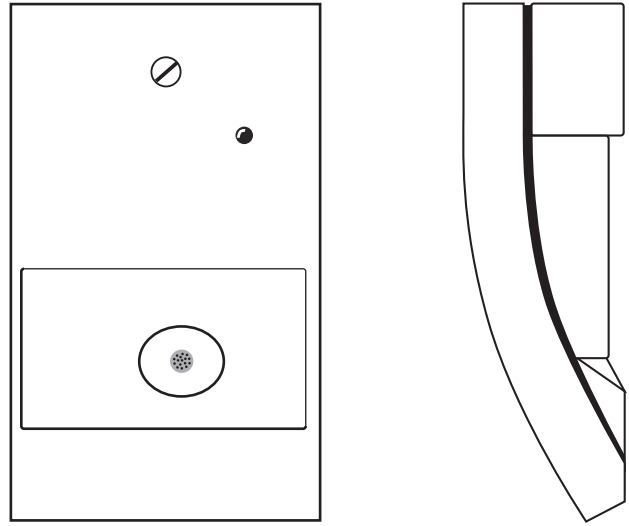
It is recommended to mount the detector on a flat surface, which is free from objects in a radius of 50 cm from the detector.

Avoid mounting close to air vents.

Avoid big sound reflecting obstacles in the proximity of the detector.

Never mount the detector in corners.

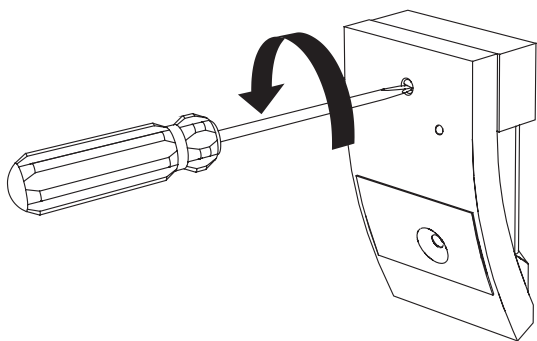
Decide how many detectors you will need to protect the room.



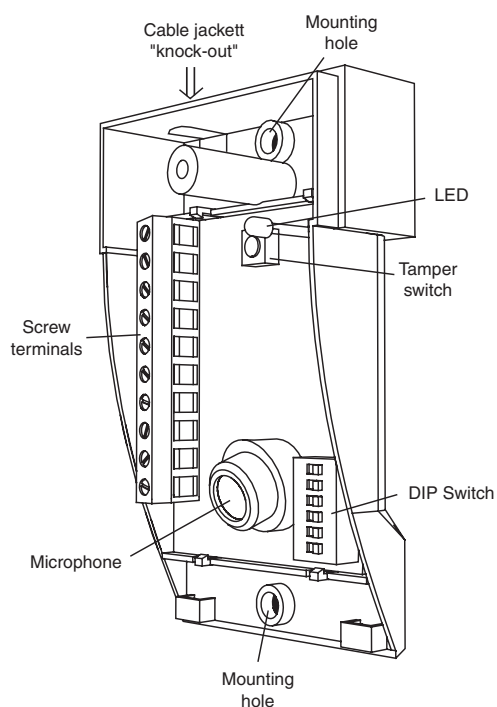
Location for wall or ceiling mount.

Installing the detector

1. Choose the best mounting position on the wall or ceiling.
2. Loose the cover screw and remove the cover.



3. Use the bottom part as a template and mark the place of the holes of with a pen.



4. Use a 2,5 mm drill for the self-tapping screws provided. If necessary use wall anchors.

5. If necessary cut out the marked "knock out hole" on the back of the base with a pair of tongs.

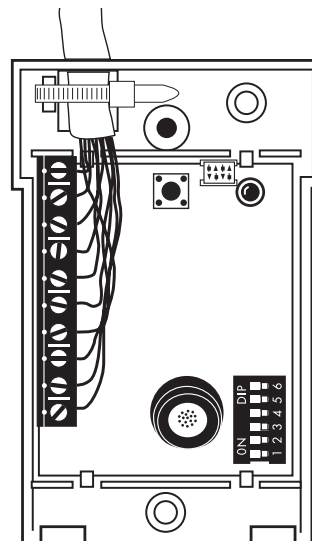
6. Pull the wiring cable through the knock out hole in the bottom plate.

7. Connect the wires to the screw terminals.

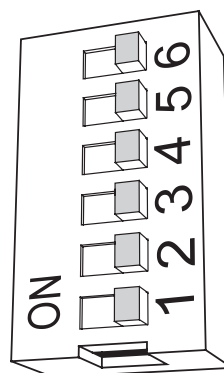


- | | |
|-------|---|
| 10 Sp | Spare terminal connection |
| 9 Sab | Tamper switch output |
| 8 Sab | Tamper switch output |
| 7 Sp | Spare terminal |
| 6 NC | Relay output normally closed in quiescent state |
| 5 C | Relay output connector |
| 4 D/N | Day and Night control of LED |
| 3 AIS | Alarm Information System |
| 2 + | Plus 9 to 15 VDC |
| 1 - | Ground |

8. Use the cable strap provided to fix the wiring cable to the detector.



9. Fix the detector firmly to the base with the enclosed screws.



- | | | |
|-----------------|--------|-------------|
| 6 Audio test | ON | OFF |
| 5 Range setting | 1-2 m | 2-4 m 4-9 m |
| 4 Range setting | OFF | OFF ON |
| 3 D/N polarity | ON | OFF OFF |
| 2 LED mode | D=high | D=low |
| 1 Relay mode | AIS | Monitor |
| | Latch | Auto |

Understanding the DIP Switches

DIP1 Relay mode ON means the LED will Latch and be permanently on in alarm. Relay mode OFF means the LED will be Auto reset after 2 seconds in Alarm.

DIP2 LED mode ON means AIS (Alarm Information System) is on. This is used for first up alarm indication when the detector is connected in series. LED mode OFF means Monitor and the relay will follow the alarm relay.

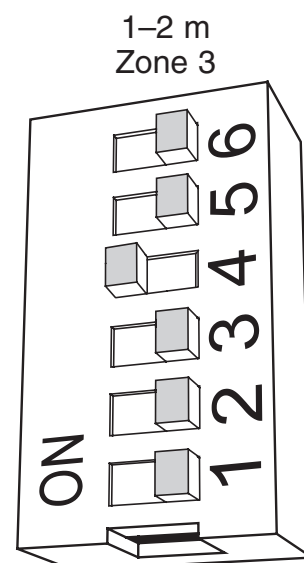
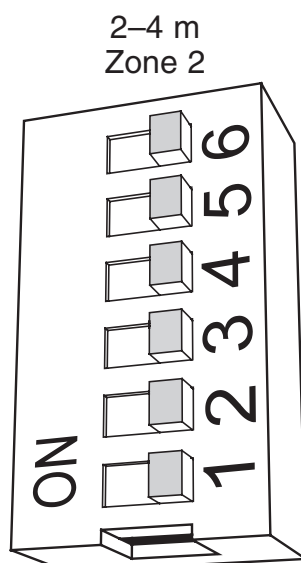
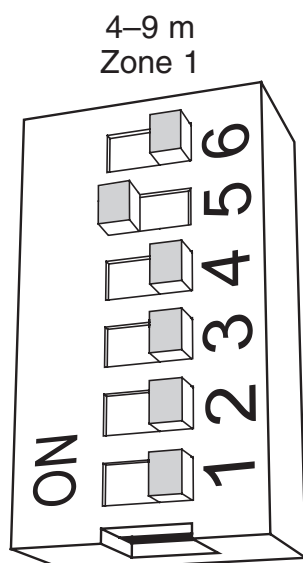
DIP3 D/N polarity mode ON means D=High means current is high during day time. D/N polarity mode OFF means D=Low means current is low during the day time.

DIP4 Range setting 1-2 m 2-4 m 4-9 m
ON OFF OFF

DIP5 Range setting OFF OFF ON

DIP6 Audio test mode ON means "handclap" test on. Audio test mode OFF means "handclap" test off.

10. Set the desired range, i.e. the detector sensitivity setting by using the DIP switch no 4 and 5.



11. Check the window constructions and note what kind of glass is used and especially in the pane closest to the room.

Suggested settings of the detector depending on window design and type of glass

- **Single glass** (float & tempered) – Set the detector at the measured distance from the glass to the detector.
- **Double glass** (float & tempered). If there are high disturbances in the surroundings – Set the detector at the measured distance from the glass to the detector. At normal or low disturbances – The detector shall be set at Zone 1*(4–9 m) for optimal function.
- **Double glass** where the inner pane is covered with **security film** – Set the detector at Zone 1*(4–9 m) apart from the measured distance.
- **Triple glass** (float & tempered) – Set the detector at Zone 1* (4–9 m) apart from measured distance.
- **Laminated glass** – Set the detector at Zone 1* (4–9 m) apart from the measured distance.

*It is important that the detector is placed in the coverage area within 1 to 9 m.

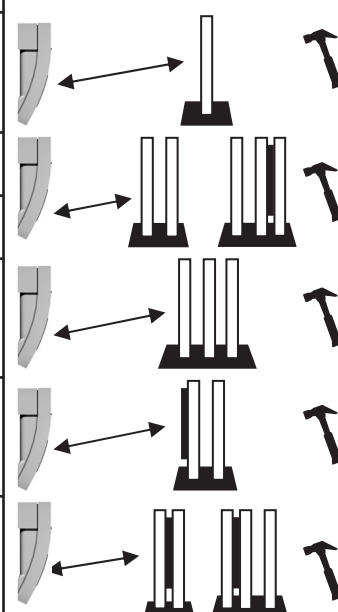
Check with the ADT 700 tester.

If the detector is placed too far from the glass or too close, it will not respond.

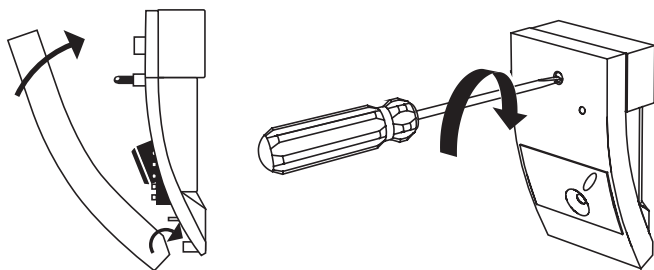
At DRC testing the LED of the detector will flash 1, 2 or 3 times to show it is in a certain Zone. If it does not flash a better place must be selected.

Suggested settings

Window design		Glass type of pane inside room		Range		
				1–2 m	2–4 m	4–9 m
1	Single glazed	Float & tempered		Zone 3	Zone 2	Zone 1
2	Double glazed	Float & tempered	High disturbances	Zone 3	Zone 2	Zone 1
			Low disturbances	Zone 1		
3	Triple glazed	Float & tempered		Zone 1		
4	Double glazed with security film	Float with security film		Zone 1		
5	Single and multi-glazed	Laminated		Zone 1		



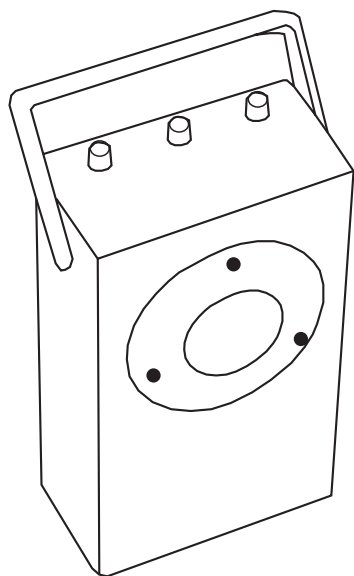
12. Put the cover on and make sure it hooks properly into the base of the detector. Fasten the cover screw properly.



13. Apply power - LED will now indicate your range setting by blinking 1-3 times.

14. By a simple hand-clap test you can check that the microphone and electronic circuit works properly. Just Set DIP6 Audio test mode into ON state, clap your hands close to the detector and the LED will flash. *Note:* This is no indication of the sensitivity of the detector.

15. Use ADT 700 to test and calibrate the detector for optimal position.



ADT 700 Tester and Calibration unit

Testing and calibrating

ADT 700 tester is a specially developed tool for calibrating and adjusting the detector AD 700 for optimal function in the acoustic room – the DRC Digital Room Compensation procedure.

When testing the detector settings you do not need to open it again as the tester will communicate with the detector acoustically.

Never test the AD 700 with open lid. Make sure the lid is fastened properly.

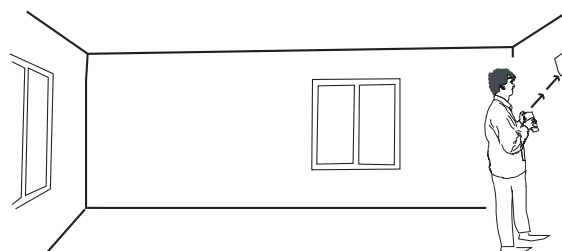
Caution: Do not use the ADT 700 tester in proximity to your ears as the tester produces loud noises.

Digital Room Compensation procedure

Prepare the acoustic detector for DRC by following steps:

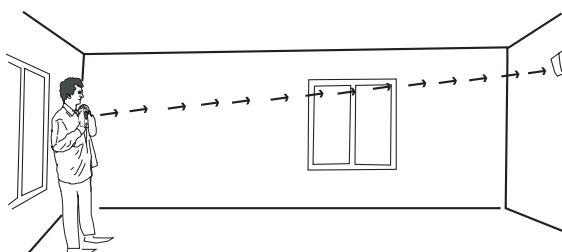
The DIP switches inside the detector should be set as follows before testing.

1. DIP2 LED shall be in Monitor mode (OFF state).
2. DIP3 D/N shall be in D=Low mode (OFF state) or if AIS is applied (TEST ENABLE).
3. Press the START button of the ADT 700 tester to put the power on. Green LED will light.
4. Hold the tester 0,7 to max 1,5 m from the detector and aim the speaker at it.



5. Press the START button once more to initiate the DRC mode. The LED on the detector will start to flicker.

6. Go to the furthest distance (max. 9 m) of the glass to be protected and aim the speaker at the detector.



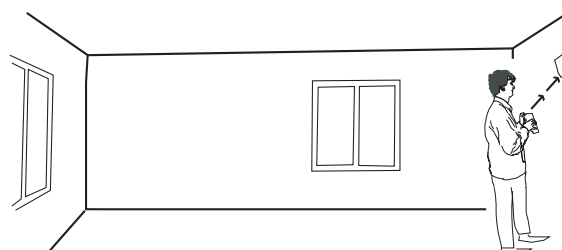
7. Press the DRC button to send a DRC signal out. Make this 2–10 times from different angles of the protection area for optimal capability.

The LED will flash confirming it has received the signal. The LED will then start to blink and flicker.

The DRC range calculated by the detector will be displayed as a number of pulses from 1 to 3.

In case of too weak or too strong signals outside the compensation range (means that the detector is placed too close or too far from the object to be protected), the detector will then not show DRC range.

8. Press the STOP button from a distance of 0,7 to max 1,5 m from the detector to terminate the DRC procedure.



If DRC range measured by the detector is different from actual DIPswitch settings; then the LED will continue to blink from 1–3 times showing the correct range number to be set in the detector.

The LED blinks 1 time: set to Zone 1 (4–9 m).

The LED blinks 2 times: set to Zone 2 (2–4 m).

The LED blinks 3 times: set to Zone 3 (1–2 m).

Protecting several windows by one detector

AD 700 can protect several windows in one room if the windows are within the coverage area.

Make independent DRC test for each window to be protected.

Follow the procedure above for each window.

The detector shall be **set to the lowest Zone number** that is the longest range from the detector.

Timeout

Both the AD 700 detector and ADT 700 tester are equipped with a timeout feature.

The AD 700 will stop the DRC mode and the ADT 700 will switch off power if no activity has happened within 4 minutes.

Understanding the LED when the detector is in operation

LED	Status of the detector
Permanently on	In Alarm; if Relay mode is in Latch
Flashes 1-3 times when powered ON	Indication of range setting
Flashes when clapping your hands	Audio test on
Flashes slowly for 2 sec	Low supply voltage

Understanding the LED when testing the detector

LED	Status of the detector
Flickers	In test mode
Flickers and blinks	In calibration mode
Flashes 1,5 sec	Confirms received signal
Blinks slowly 1 time each 2,5 sec after calibration	Set range setting to Zone 1 (4–9 m)
Blinks slowly 2 times each 2,5 sec after calibration	Set range setting to Zone 2 (2–4 m)
Blinks slowly 3 times each 2,5 sec after calibration	Set range setting to Zone 3 (1–2 m)

Troubleshooting

Detector does not respond

- Check the supply voltage and polarity

LED permanently on

- Switch off the detector for a short period
- Check if LED is in latching mode (DIP1=ON)

No alarm

- Check the alarm wiring
- Check the alarm loop wiring
- Check the power supply voltage and polarity

AIS (Alarm Information System)

The AIS makes it possible to remote control the alarm indications of the detectors. You can also remotely reset the relay and alarm indications and see which one of the detectors first was giving an alarm. The AIS increases the security of the detector, as it enables the alarm indications to be concealed in both DAY and NIGHT mode without any influence on the relay function. AIS also makes it possible to prevent testing of the detectors by the ADT 700.

Remote-control of DAY and NIGHT mode and indication of the detector giving first alarm

Connect the detectors (max. 20 pcs) in accordance with the following schedule and set the DIP-switches.

DIP2=ON (AIS)

DIP3=OFF (DAY= open line)

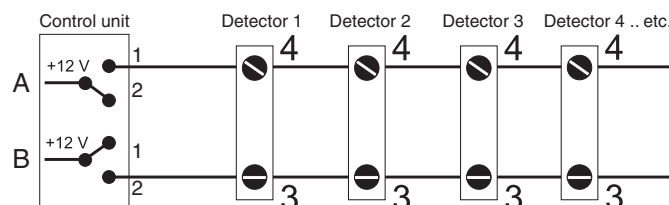


Fig. 1. This is the Start position. The detectors are now in DAY mode. There is no Led-indication of an alarm, but the alarm relay will open at an alarm. It is not possible to test the detectors with ADT 700.

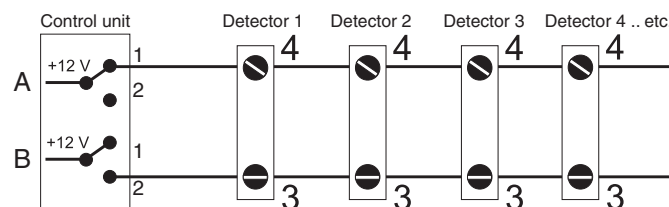


Fig. 2. The detectors are now connected in NIGHT mode. There is no indication of an alarm. The information is stored in an Alarm-memory. In case of alarm the relay will open. It is not possible to test the detectors with ADT 700. If the position of any DIP-switch is changed an alarm will be triggered. The alarm relay will follow the setting of DIP1.

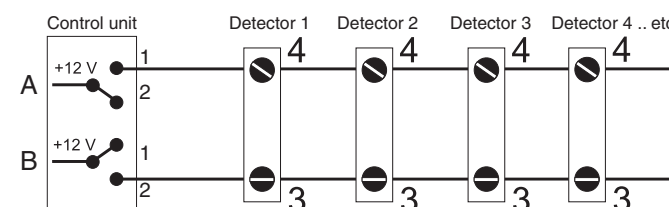


Fig. 3. The detectors are now in DAY mode. If some detectors have given an alarm during NIGHT position, this will be indicated on LED. The alarm relay follows the setting of DIP1. Led will flash on the detector giving the first alarm and will shine firmly on the other alarming ones. When switching from DAY to NIGHT – all the detectors are reset.

To test the function of the detectors with the ADT 700

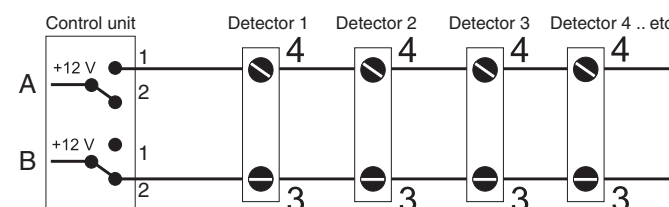


Fig. 4. Set the switches A and B in the position showed in fig. 4. The detectors are now in Day mode and prepared for receiving signals from the ADT 700 (See Function-test of the alarm relay using ADT 700). When testing is finished the switch B must be set in position 1. Otherwise the indication of first alarming detector will be blocked in NIGHT mode.

Function-test of the alarm relay using the ADT 700 tester

Start the testing by pressing the start button at the ADT 700 at a distance of around 1m from the detector. LED then starts to flash confirming it is set in test mode. The alarm relay is now open.

End the test by pressing the ADT 700 stop button at a distance of 1m from the detector. The alarm relay will now close. The test will otherwise end up automatically after 4 minutes.

Function test of the alarm relay by connecting to terminal 4 (D/N)

Set DIP3=OFF (NIGHT mode) – connect +12V to terminal 4 (D/N) in the detector

If any change in the position of DIP-switches now is done, the alarm relay will open.

Attention: If DIP1 is in OFF mode, the relay will be open for 2 seconds only and then close.

If DIP1 is in ON mode, the relay will be open and close when the power is switched off or if the mode is changed from DAY to NIGHT on terminal 4.

Another alternative to close the alarm relay is to switch DIP3 over to ON mode.

Technical data AD 700

Supply voltage	9-15V DC	Operating temperature	–10° to +55° C
- Voltage monitoring	Alarm at <7 V+/- 0,5V	Humidity (DIN 40040)	<90% r.h. (class F)
Current consumption at 12V		Housing protection category	IP31
- Quiescent	ca 16 mA	Approvals	
- Alarm state	ca 14 mA	INCERT	B-582-0017
Alarm relay Normally Closed	500 mA/max 100V DC/R<40 ohm	F&P	Registered
Tamper contact rating	50 mA/max 50V DC	SBSC	No 04-693
Coverage		VdS Klasse B	G104512
- Max range	9 m radius/165°	<i>National approval conditions relating to the use of the detector must be followed!</i>	
- Range setting	Zone 3 = 1–2 m		
	Zone 2 = 2–4 m		
	Zone 1 = 4–9 m		
- Size of glass to be protected	min 30x30 cm, max 3x6 m		
- Max thickness of glass	6 mm		
- Approved glass	Standard window glass (float glass)		

Alarmtech reserves the right to change specifications without prior notice.

© 2006 Alarmtech