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DELTA Test Report

Magnetic and electromagnetic field attack on ASSA CLIQ
Performed for Svenska Stölskyddsföreningen
Project no.: E702303
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2009-05-08

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Title Magnetic and electromagnetic field attack on ASSA
CLIQ
Project no. E702303
Client Svenska Stölskyddsföreningen
115 87 Stockholm
Sverige
Contact person Håkan Hedlund
Object ASSA CLIQ
Test period 2009-04-25, 2006-04-27
Specification DRAFT SIS-TR 20, 2008 chapters "Angrepp med magnetfält" and "Läsa av koden"
Result The test object was found to be in compliance with the specifications, as listed in section 1.
Carried out by Ulf Bjurman
Date 2009-05-08
Responsible



Ulf Bjurman, EMC & Safety Engineer
DELTA Development Technology AB

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1. **Introduction**

The present report gives the results of magnetic and electromagnetic field attack on ASSA CLIQ

Test Procedures:

Magnetic field attack:

DRAFT SIS-TR 20, 2008 "Angrepp med magnetfält"

REF:

DRAFT, prEN 15684, 27 March 2008

Shielded attenuation measurement,

§4.8.6: Magnetic field attack

Electromagnetic field attack:

DRAFT SIS-TR 20, 2008 "Läsa av koden"

2. **EUT**

ASSA CLIQ

Serial no. ATL-09-007-4

3. **General test setup**

The EUT was a key and the cylinder these components were subjects of the performed tests more details is presented in each chapter of the report. To perform the tests on the electronic blocking of the lock the mechanical blockings were removed, in order to verify that the electronic blocking is working. All tests were performed on the cylinder itself without the surrounding lock mechanism.



Figure 1 Test setup

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4. **Magnetic field attack test**

The test was carried out using a magnetic coil with a 5 cm air-gap. The coil was excited by a 20 A DC-source. The EUT was turned in all three dimensions here pictured by showing the three main directions. The field direction was changed between plus and minus direction. During the field exposure a torque was applied to the key to see if the electronic blocking of the lock mechanism was influenced. The lock was also tested by slow and rapid insertion of the field both with and without torque.



Figure 2 pictures of the test setup

The test was performed in accordance with:

Standard: DRAFT SIS-TR 20, 2008 "Angrepp med magnetfält"

REF:

DRAFT, prEN 15684, 27 March 2008

Shielded attenuation measurement,

§4.8.6: Magnetic field attack

Climatic conditions during the test:

Temperature 21 °C

RESULTS: 4. Magnetic field attack test

The result of the magnetic field attack is PASS. The electronic blocking of the lock mechanism stayed in locked position during the test. However the lock could be held in the locked position by the field despite attempts to unlock the lock by the correct key.

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5. *Electro magnetic field attack test*

The test was carried out using an antenna and a spectrum analyzer with preamplifier. The electric and magnetic near field was measured during the unlocking procedure when the key was inserted into the cylinder. We had no prior knowledge of the signaling in the lock so only broad band measurement was performed. The listening test was performed also with the outer part of the cylinder removed to increase the sensitivity of the measurement and on closer distances then the regulatory 50 cm. Three antennas were used in the test a rod monopole telescopic antenna, a coaxial magnetic loop antenna and a Bi-log antenna.

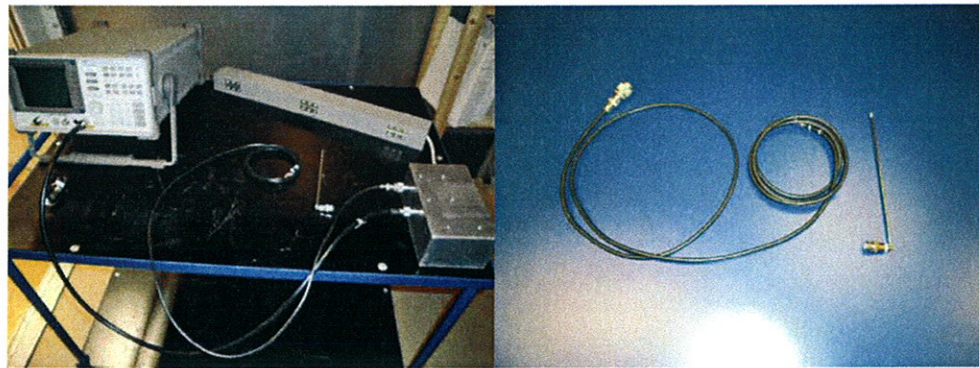


Figure 3 picture of the test setup (left) and the antennas (magnetic loop and rod antenna) (right)

The test was performed in accordance with:

Measured frequency range: 30 MHz – 1 GHz

Bandwidth: 120 kHz

Climatic conditions during the test:

Temperature 21 °C

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RESULTS: 5. Electro magnetic field attack test

The result of the electro magnetic field attack is PASS. No near field was detectable.

COMMENTS: 5. Electro magnetic field attack test

The listening test was performed in an anechoic chamber, the resulting noise level was approximately - 120 dBm. A normal urban environment has approximately - 90 dBm hence the broad band measurement performed will not likely be used by an intruder, more likely will a narrow band method with a resonant antenna be used to detect signals from the lock. With a resonant antenna a 20 dB higher sensitivity can be expected. To use the narrow band method the villain will have to have more details on the design of the unit.

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6. *Test Equipment*

INSTRUMENT	MANUFACTURER	TYPE	IDENT NO.
Coaxial magnetic loop antenna		120 mm 3 turns	
Monopole antenna		200 - 400 mm	
Bilog antenna	York SCHWARTS-BECK	CBL6141A	E-P400
Spectrum analyzer	HEWLET PACK-ARD	HP8591EM	36002
Preamplifier	DELTA	DELTA UB	
Magnetic coil	DELTA	DELTA UB	

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