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Certified Integrated Management System (Quality, OH&S, Environment)
in conformance with: PN-EN ISO 9001:2001 PN-N-18001:2004, PN-EN ISO 14001:2005
Notified Body No 1453

Copy no 1/2

TEST RAPORT No BR-1/27/2007

SWEPT SINE VIBRATION TESTING ON DIGITAL HIGH SPEED EVENT AND DISTURBANCE RECORDER BAY UNIT ARCHI LGU/HS

The name and address of the client:: Computers & Control Sp. J.
40-246 Katowice, ul. Porcelanowa 11

Date of the issue of the report: **17th of August 2007**

signed

A. C. Staniek, Ph.D., Eng.

approved

J. Kompała, Ph.D.

**Head of the Laboratory of
Technical Acoustics**

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Central Mining Institute   Laboratory of Technical Acoustics

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1. THE NAME AND ADDRESS OF THE LABORATORY

Laboratory of Technical Acoustics

Central Mining Institute

Pl. Gwarków 1, 40-166 Katowice, Poland

2. THE NAME AND ADDRESS OF THE CLIENT

Computers & Control Sp. J.

40-246 Katowice, ul. Porcelanowa 11

3. THE DATE OF PERFORMANCE OF THE TEST

21st of April 2009

4. IDENTIFICATION OF THE TESTED SPECIMENS

DIGITAL HIGH SPEED EVENT AND DISTURBANCE RECORDER BAY UNIT ARCHI LGU/HS

5. THE AIM OF THE TEST

The aim of the test was to determine the ability of specimens to withstand specified severities of sinusoidal vibration., at the specified frequency range and in three mutually perpendicular axes. The frequency ranges, amplitudes and duration of the test were chosen in accordance with the International Standard PN-EN 60068-2-6: 2002 and were stated by the client.

6. SET-UP FOR SWEEP SINE VIBRATION TEST

he test was performed on the laboratory stand and in a set-up presented in Fig.1, using the following apparatus:

- ✓   Vibration Exciter type 4823, s/n 349592, manufacturer Bruel & Kjaer
- ✓   Exciter control type 1026, s/n 443728, manufacturer Bruel & Kjaer
- ✓   Power amplifier type 7329, s/n 389819, manufacturer Bruel & Kjaer
- ✓   Accelerometer type 4396, s/n 1714983, manufacturer Bruel & Kjaer
- ✓   Accelerometer type 4334, s/n 263015, manufacturer Bruel & Kjaer
- ✓   Measuring amplifier type 2525, s/n 1896339, manufacturer Bruel & Kjaer
- ✓   Measuring amplifier type 2525, s/n 1896338, manufacturer Bruel & Kjaer
- ✓   Oscilloscope type GW GOS 643, s/n 3640067, manufacturer Good Will Malaysia
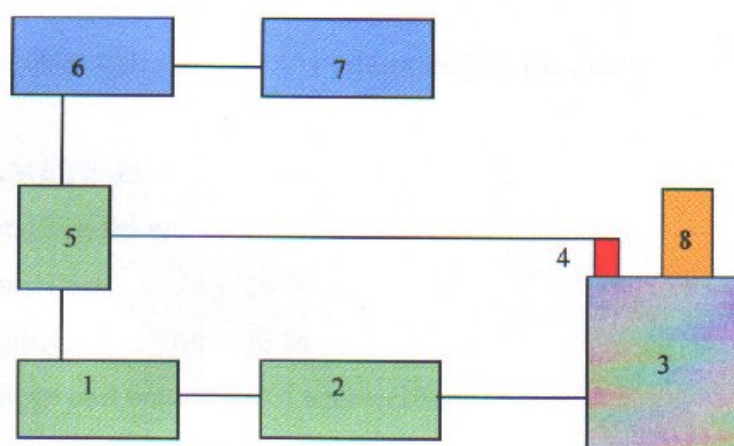
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Fig.1 *Set-up for endurance tests, 1 – exciter control, 2 – power amplifier, 3 – vibration exciter, 4 – reference accelerometer, 5,10 – measuring amplifiers, 6 – oscilloscope, 7 - distortion meter (optional), 8- test specimen*

DIGITAL HIGH SPEED EVENT AND DISTURBANCE RECORDER BAY UNIT ARCHI LGU/HS was mounted on the vibration table using a special frame (see: Appendix 2). A control accelerometer was mounted on each motor to determine its resonant frequency.

7. REALIZATION OF THE TEST

The DIGITAL HIGH SPEED EVENT AND DISTURBANCE RECORDER BAY UNIT ARCHI LGU/HS was tested at constant amplitude of acceleration equalled to 4,9 m/s^2 (peak) at the frequency range 10-150 Hz (see: curves for amplitudes in Appendix 1) and in three mutually perpendicular axes X,Y,Z. The sweep rate was equalled to 1,0 octave per minute. Duration of continuous sweeping (sweeping: forward and reverse) was 5 cycles.

The functionality of the device was checked after the test at each axe. The verification consisted of the following items:

1. Communication with supervisory unit SAZ2000.
2. Error check.
3. Reading of temporary values.
   Triggering of registration.
4. Data acquisition and logging.
5. Transmission of data to supervisory unit.

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8.   SAMPLING OF SPECIMENS

There was one specimen (for relevant type) delivered by the client.

9.   TEST PARAMETERS

1.   Environmental conditions

    1.1   Temperature: $24 \div 28\ ^\circ C$

    1.2   Humidity: $44 \div 58\ \%$

2.   Frequency range and amplitude of acceleration

    2.1.   Frequency range: 10-150 Hz

    2.2.   Amplitude: 4.9 m/s^2 (peak)

3.   Test duration:

    3.1.   Swept sine – 5 cycles (1 oct/min, up-reverse)

    Axe X: vertical (see: Appendix 2)

    Axe Y   horizontal (see: Appendix 2)

    Axe Z: horizontal (see: Appendix 2)

4.   Reference standards:

    5.1   PN-EN-60068-2-6: 2002

10. DATE OF THE ISSUE OF THE REPORT

17th of August 2007

Authorised   Confirmed

Andrzej Staniek, Ph.D. Eng   *Janusz Świder, M.Sc. Eng.*

Cezary Bartmański, M.Sc. Eng.

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Appendix 1

Fig. 2. Available curves for test amplitudes

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Appendix 2

Fig. 3. Realization of the test – axis X

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Fig. 4. Realization of the test – axis Y

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Fig. 5. Realization of the test – axis Z

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Fig. 6. Verification of functionality of the device under test.