Name ………………………...…   Index No. ……………   Date: ....

Exercise 14 Report

Harmonic analysis of vibrations

After watching the movie you are expected to:

1. Make full description what is shown in Figures 1 - 7.
2. After analysis of FFT result of the **acceleration** signal of vibrations of the computer box calculate amplitude of **displacement** at the highest amplitude of the acceleration (Fig. 6. f=120 Hz, a=0.04 m/s^2)
3. If you can, indicate possible source of the detected vibration (inside the box).
4. After analysis of FFT result of the **velocity** of vibrations of the double-piston compressor calulate amplitude of **displacement** related to the 2 highest amplitudes of velocity (Fig. 7. f=13 Hz, v=0.003 m/s and f=26 Hz, v=0.010 m/s). Use the attached below the DGA 401 sensor characteristics and photographs of the belt transmission of the compressor.
5. What could be a source of the identified compressor vibrations? Justify why and how the frequencies are related to the design. Ignore the found frequencies of 100, 200, 300 Hz.

Calculation of displacement amplitudes

(use more space when needed…)

Your descriptions of the recorded traces, Figs. 1 – 7. Complete as much details as you canand attach some conclusions.
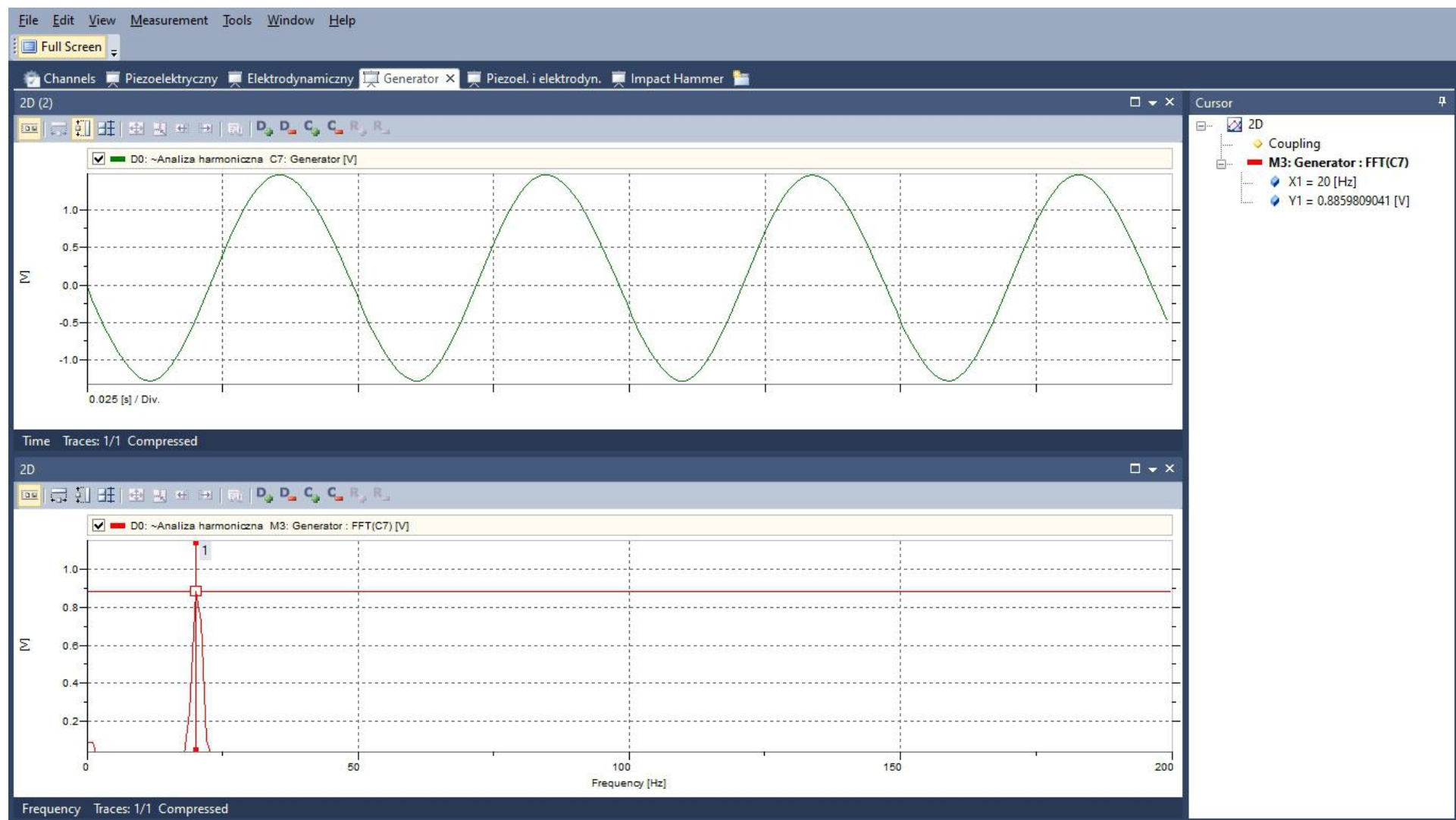
Figure 1 – Function generator signal …

Figure 2 – Function generator signal …

Figure 3 – Impact hammer signal …

Figure 4 – Noise signal …..

Figure 5 – Noise signal …..

Figure 6 – Measurement at the computer case …

Figure 7 – Measurement at the compressor …

Do not attach illustrations.
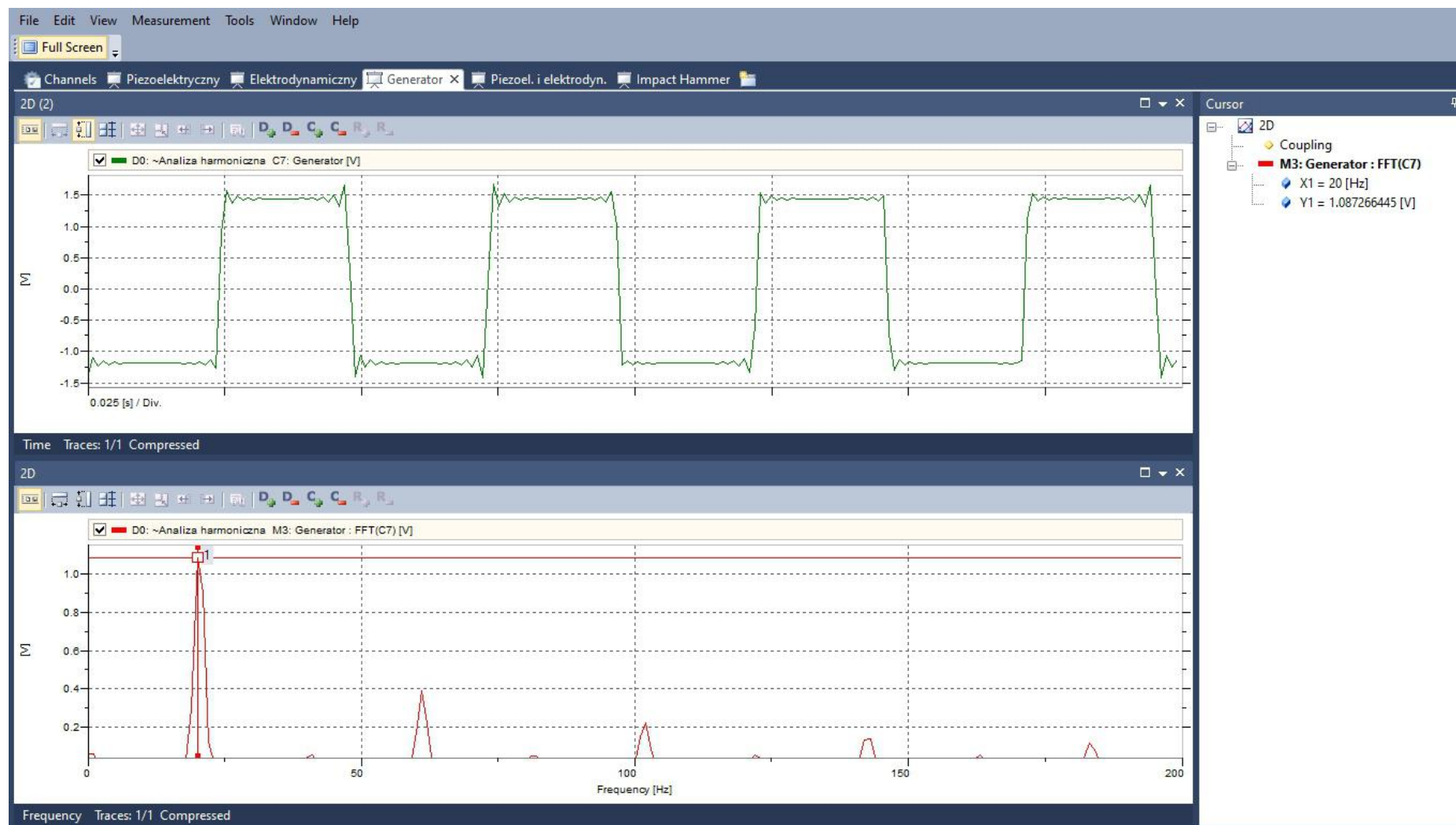
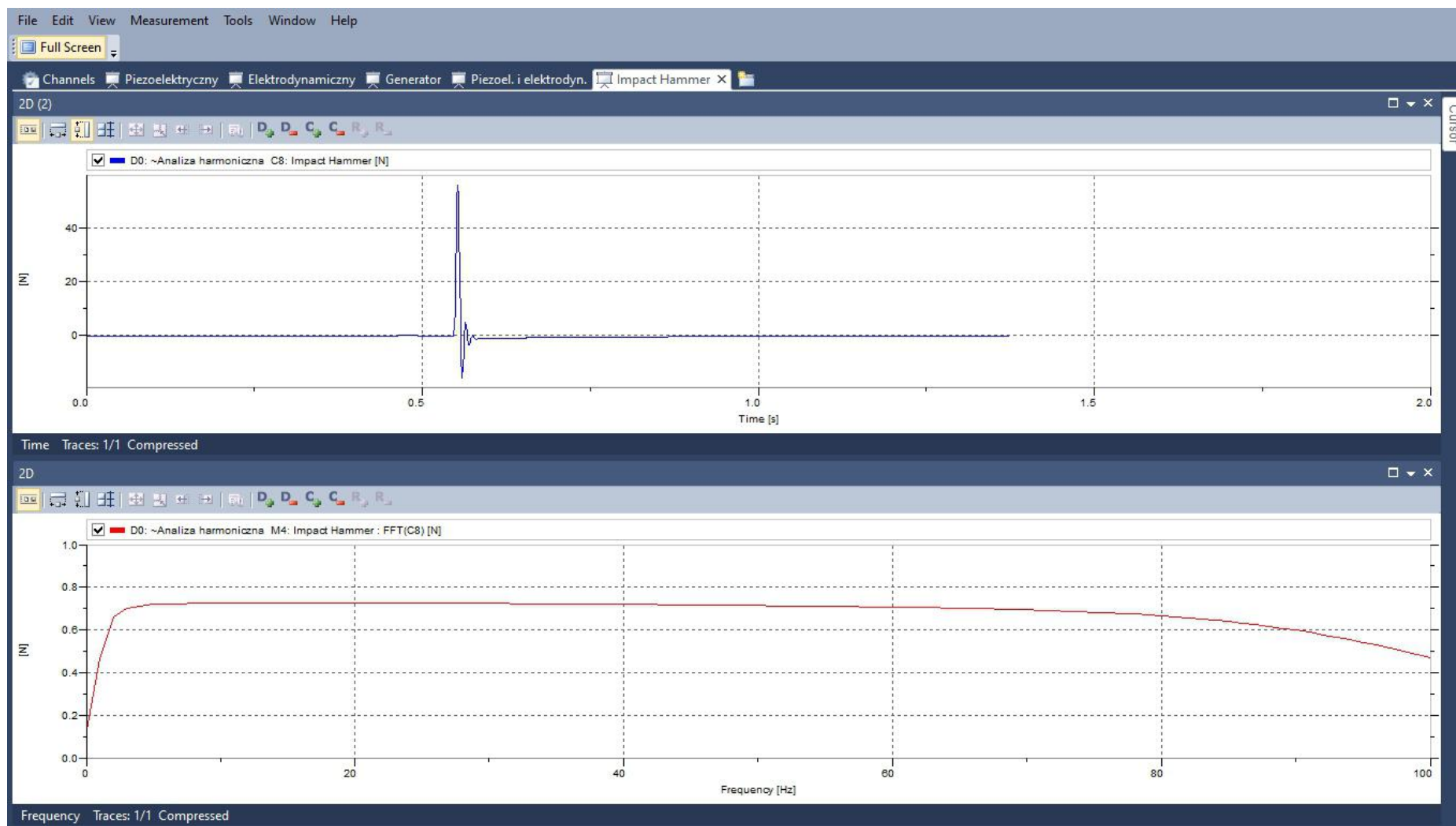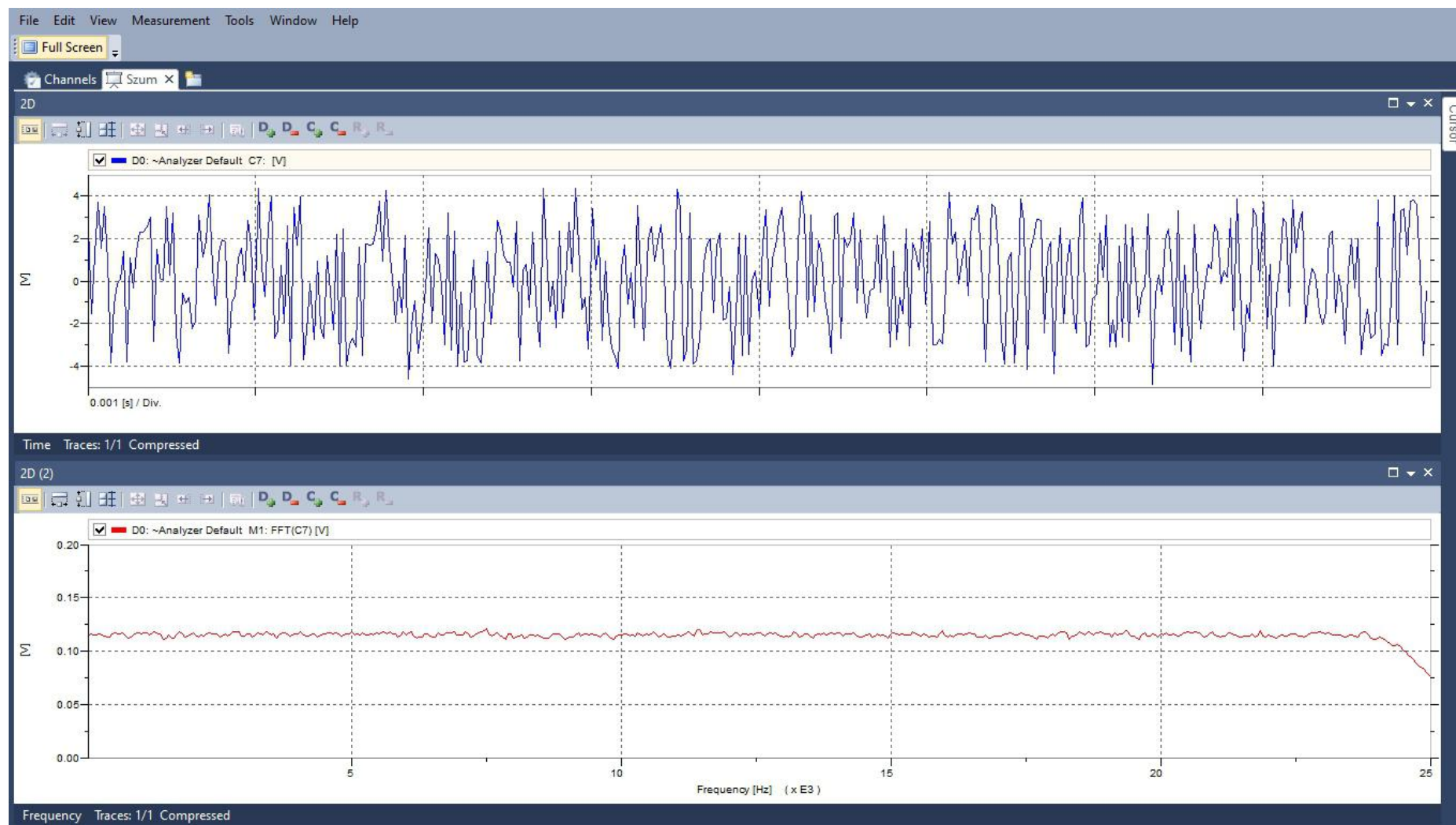Figure 1 – Function generator signal

Figure 2 – Function generator signal

Figure 3 – Impact hammer signal
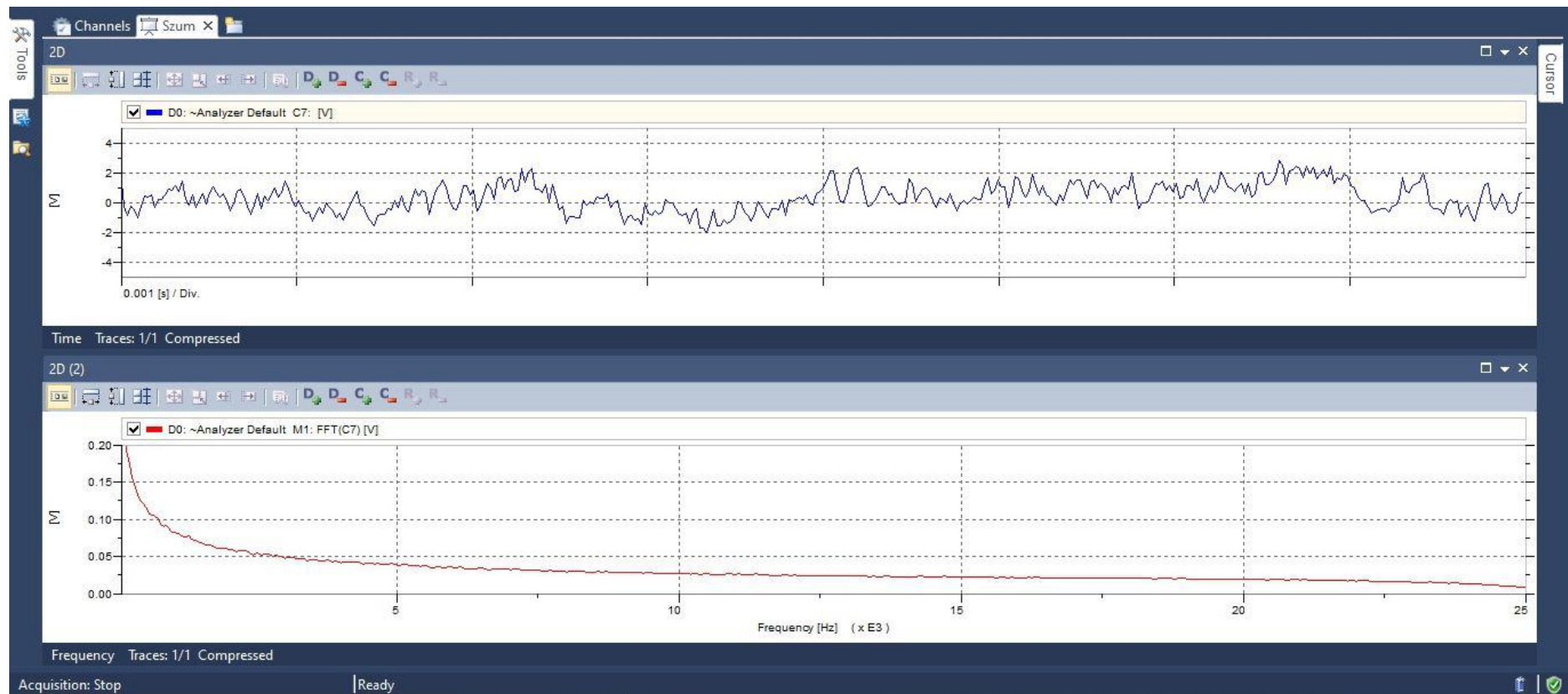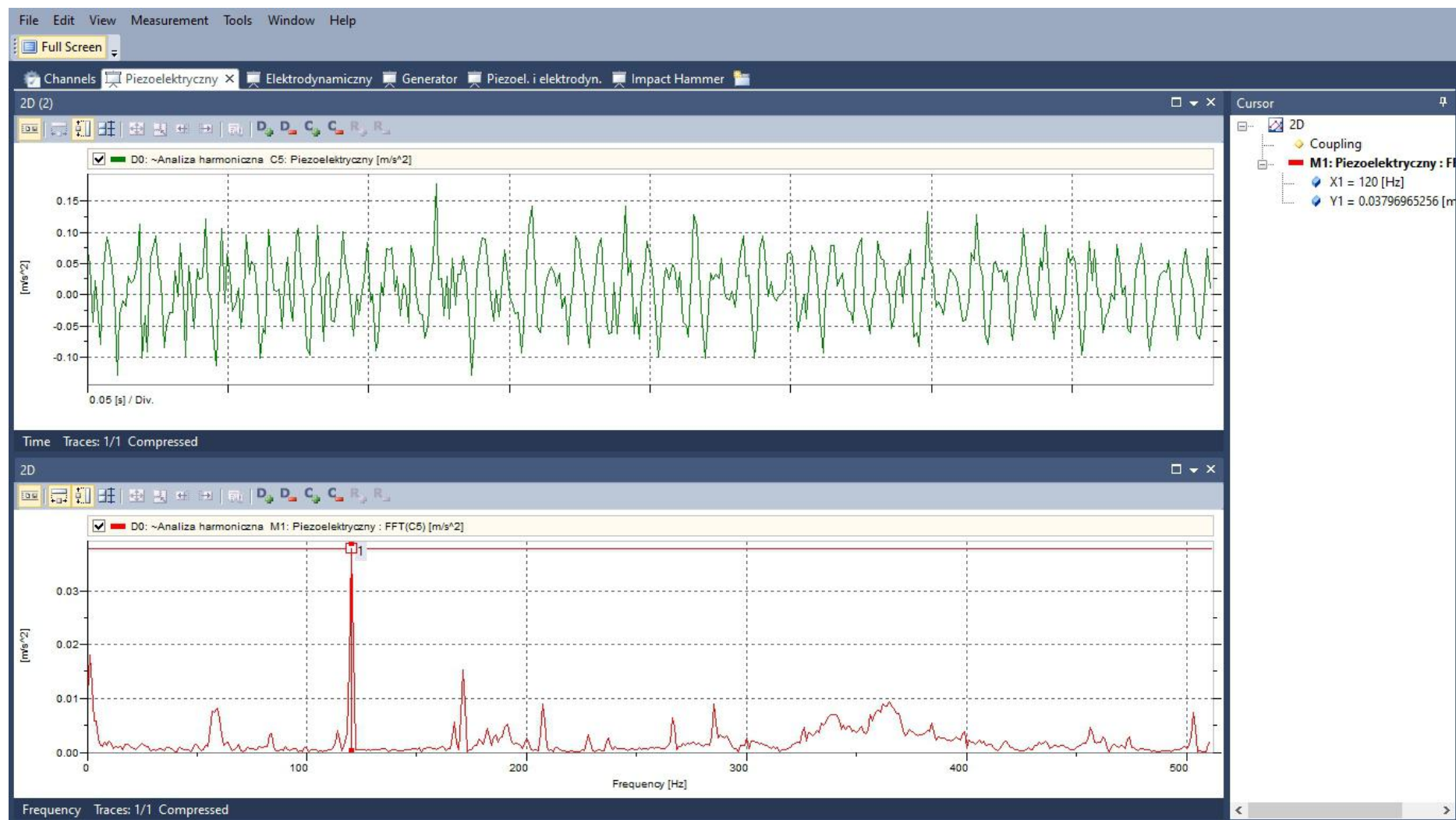
Figure 4 – Noise ...

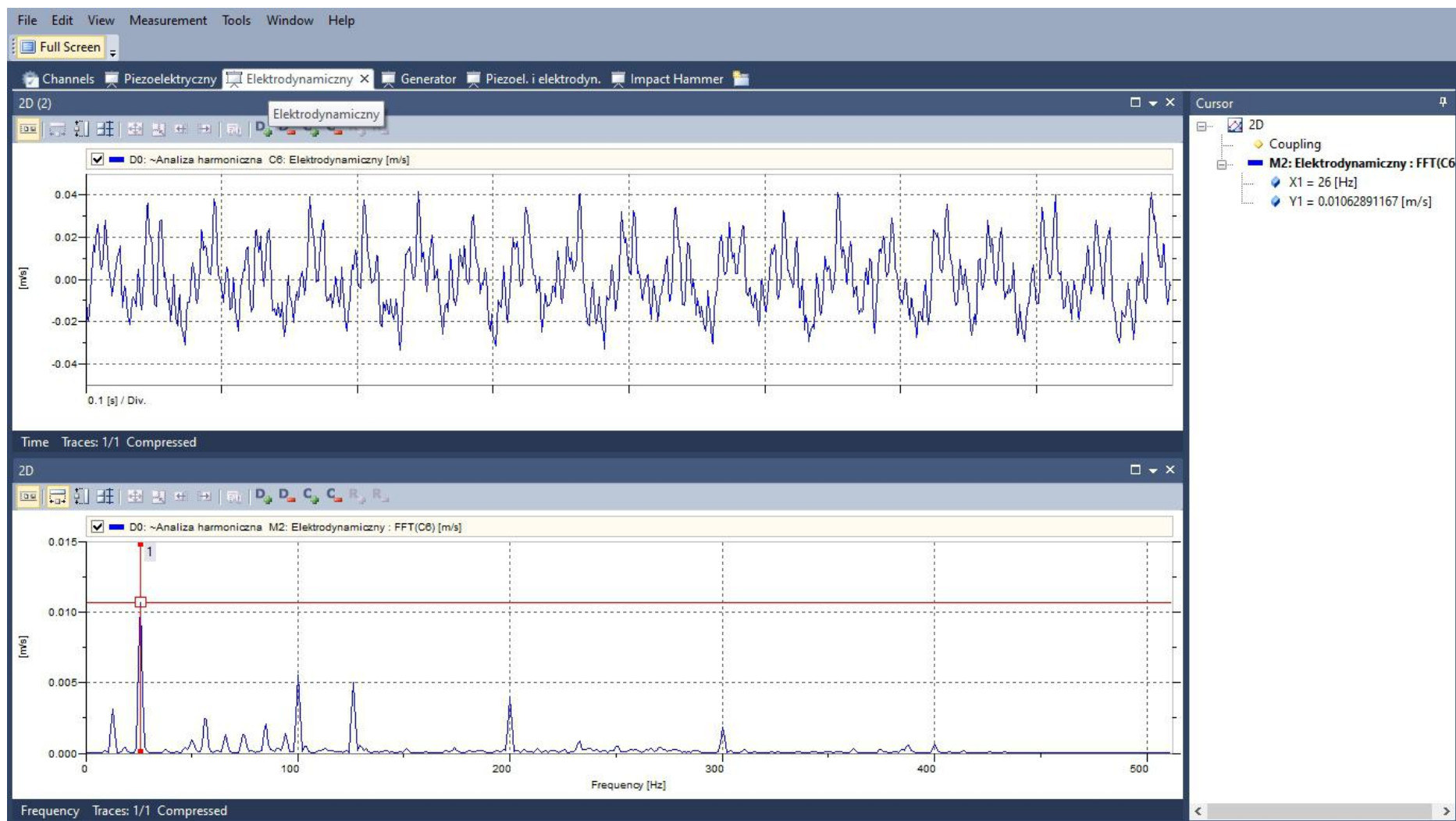Figure 5 – Noise…..

Figure 6 – Measurement at the computer case

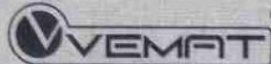Figure 7 – Measurement at the compressor

Compressor electrical engine data

VEMAT ® www.vemat.it	COMPANY WITH QUALITY SYSTEM CERTIFIED =ISO 9001=	Asynchronous Motor Phase 1
Type VHB 80C	N°4521513321	Year 15/52
kW 1.5	η% 75	IE	IP 54
V△ 230	Hz 50 A 9	rpm 2730
V△	Hz 60 A	rpm
S 3-50%	cosφ 0.97	CODE 2236112951
Is.cl.F	made in Italy	IEC EN 60034-1 CE

Compressor belt transmission. Gear ratio i = 3,5.