sonopan

ZTW-1

WIND TURBINES NOISE MEASUREMENT SET

Instruction manual

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1. CHARACTERISTICS OF THE SET

The set enables the measurement of wind turbines noise with the use of a sound level meter with a ½ " measuring microphone in accordance with the requirements of EN 61400-11. The set has been adapted to the SONOPAN WK-21 microphone, it can, however, be easily adapted to the ½ " microphone produced by another manufacturer.

The set consists of a measuring plate (1) to which the measuring microphone (2) is attached. On the microphone there are windscreens: inner (3) and outer (4). The fastening system of the windscreens enables their quick assembly / disassembly.

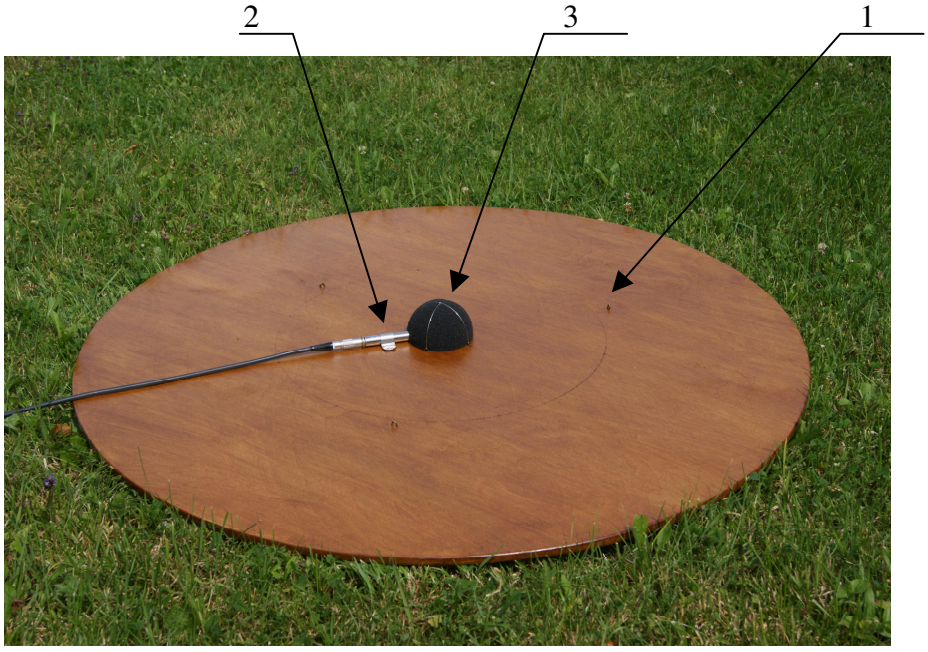

Fig. 1.1. Wind turbine noise measurement set - microphone with inner windscreen.

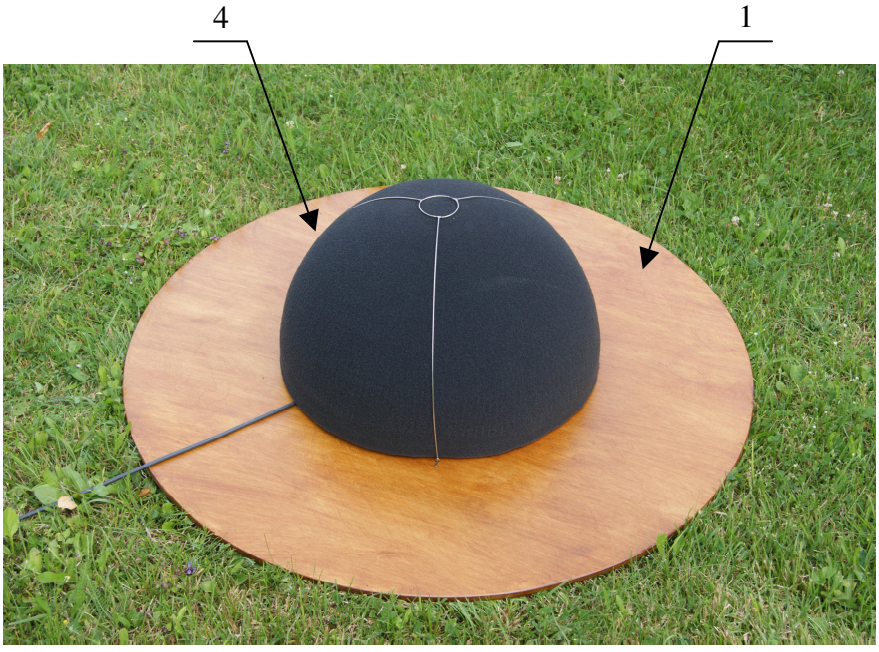

Fig. 1.2. Wind turbine noise measurement set - microphone with windscreens: inner and outer.

2. Accessories

- Measuring plate.
- OP90/2 inner windscreen.
- OP500 outer windscreen.
- Instruction manual.

3. Technical data

3.1.1. Standards

The set conforms to the requirements of the following standards:

📖 **EN 61400-11:2013** Wind turbines. Part 11: Acoustic noise measurement techniques.

3.1.2. The influence of windscreens on the characteristics of the microphone

- The influence of OP90/2 windscreen (for the angle in the range 30° - 40°)

f [Hz]	250	315	400	500	630	800	1000	1250	1600	2000	2240
dL [dB]	0.08	0.08	-0.03	0.07	0.12	0.19	0.24	0.34	0.43	0.42	0.36
U [dB]	≤ 0.10										
f [Hz]	2500	2800	3150	3550	4000	4500	5000	5600	6300	7100	8000
dL [dB]	0.29	0.11	-0.24	-0.34	-0.56	-0.80	-0.63	-0.55	-0.95	-1.07	-1.36
U [dB]	≤ 0.10						≤ 0.20				
f [Hz]	8500	9000	9500	10000	10600	11200	11800	12500			
dL [dB]	-1.44	-1.45	-1.53	-1.57	-1.88	-2.00	-2.20	-2.19			
U [dB]	≤ 0.20				≤ 0.30						

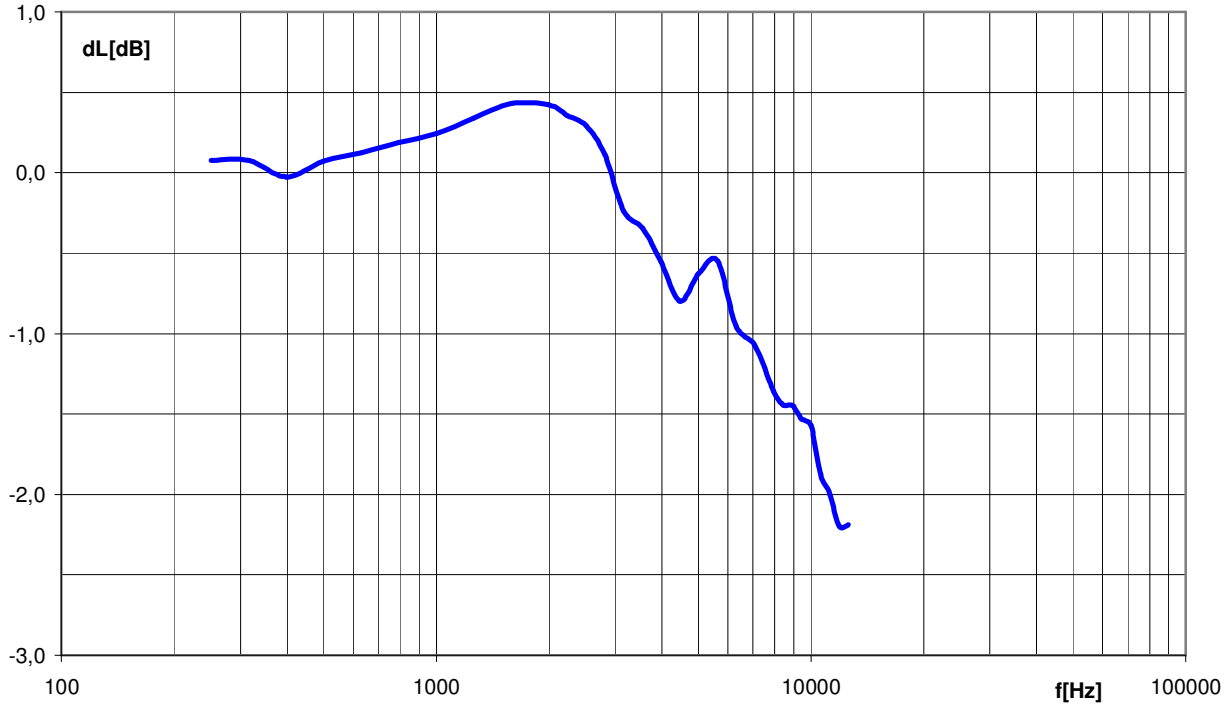

Fig. 3.1. The influence of OP90/2 windscreen .

- The total influence of both OP90/2 and OP500 windscreens on the characteristics of the microphone (for the angle in the range 30° - 40°).

f [Hz]	250	315	400	500	630	800	1000	1250	1600	2000	2240
dL [dB]	0.15	0.03	-0.19	-0.27	-0.54	-0.51	-0.10	-0.03	-0.27	-0.14	-0.69
U [dB]	≤ 0.20										
f [Hz]	2500	2800	3150	3550	4000	4500	5000	5600	6300	7100	8000
dL [dB]	0.03	-0.97	-0.60	-1.45	-1.05	-1.77	-1.78	-1.14	-1.67	-1.94	-2.29
U [dB]	≤ 0.20							≤ 0.30			
f [Hz]	8500	9000	9500	10000	10600	11200	11800	12500			
dL [dB]	-2.43	-2.37	-2.30	-2.66	-3.06	-3.12	-3.38	-3.30			
U [dB]	≤ 0.30										

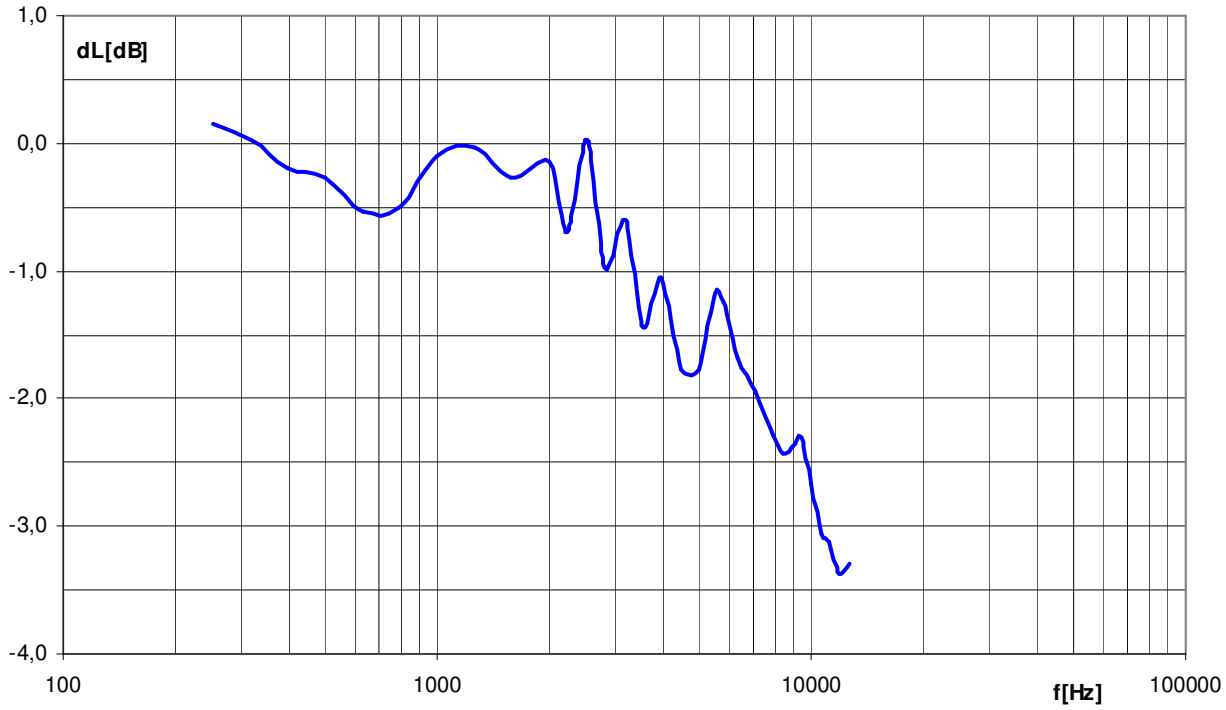

Fig. 3.2. The total influence of both OP90/2 and OP500 windscreens on the characteristics of the microphone.