Sound spectrum analysis

To record sound spectrums and detect DC bias, please use the **DC-Detector app** and synchronize your records with SITRAM CAM.

Date of analysis

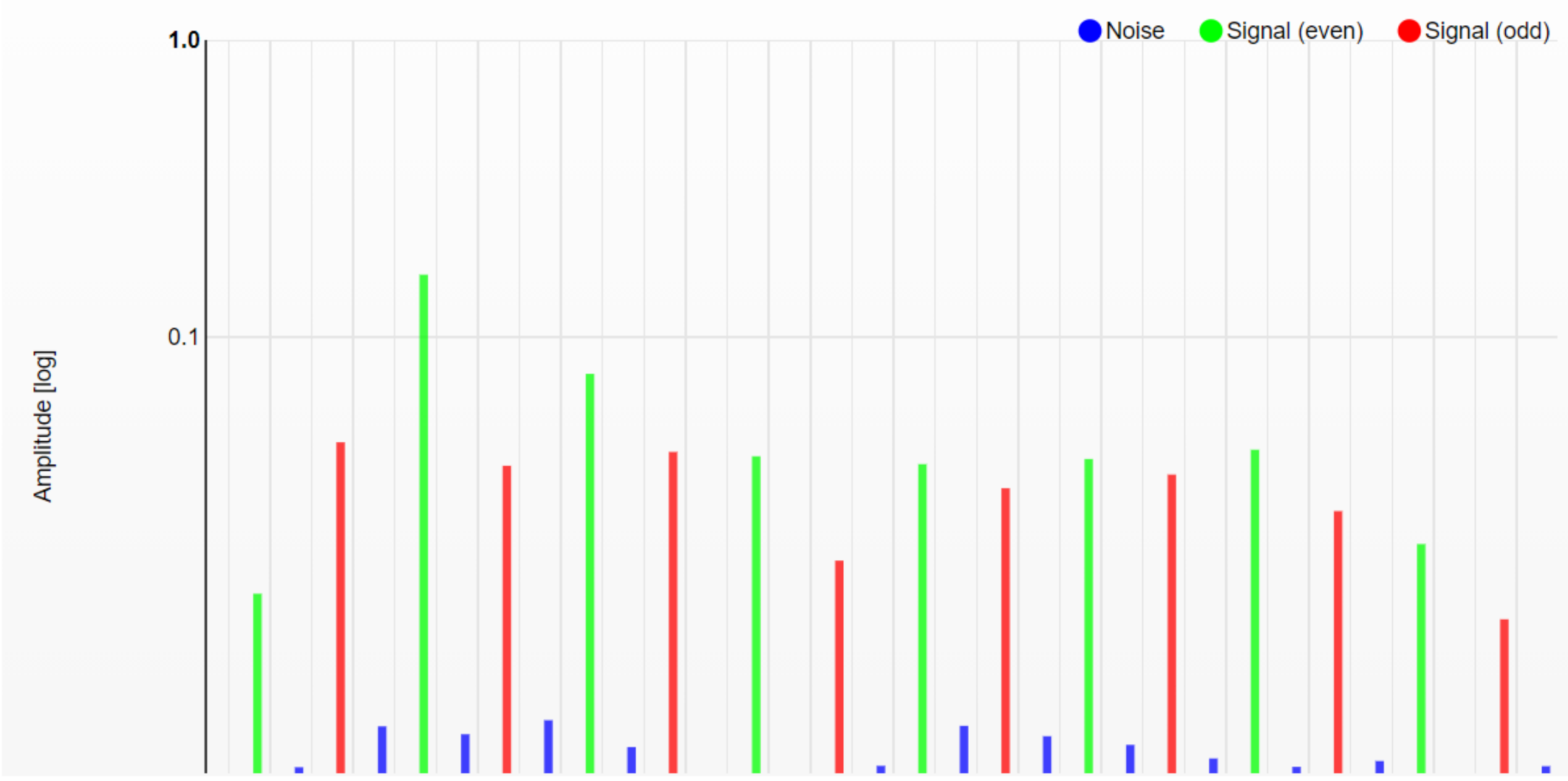
06/19/2020 16:55

Date of inspection*

06/19/2020

Remark

The spectrum shows all necessary frequencies needed for a noise diagnosis. The even harmonics (green) exist at any time at transformers under nominal condition. The odd harmonics (red) develop mainly when the transformer is under influence of direct current. Under nominal conditions the odd harmonics are significantly smaller that the even harmonics. The noise level (blue) should be significantly smaller than the even harmonics, higher values indicate unfavorable conditions during measurment.



Signal-to-noise ratio

Signal even		Noise		
Frequency	Amplitude	Frequency	Amplitude	$R_{noise, gN}$ [dB]
100.0	0.014	75.0	0.003	6.92
200.0	0.162	175.0	0.005	15.23
300.0	0.075	275.0	0.005	11.68
400.0	0.040	375.0	0.003	11.31
500.0	0.037	475.0	0.004	10.17
600.0	0.039	575.0	0.005	9.35
700.0	0.042	675.0	0.004	10.41
800.0	0.020	775.0	0.004	7.32
900.0	0.023	875.0	0.004	8.10
1,000.0	0.014	975.0	0.003	7.61
			SNR_{dB}	9.81

Resonance factor

	Max Fst	Max Sec	RF_{dB}
Even	0.16	0.08	3.34
Odd	0.04	0.04	0.33

Load noise dominance

Sum fundamental	Sum higher	LND_{dB}
0.01	0.35	-14.13

DC bias value

Sum even	Sum odd	DCE_{dB}
0.45	0.25	-2.54

Diagnosis

Signal-to-Noise Ratio: Based on the recording, the relevant frequencies could not be analyzed with sufficient quality. Ambient noise (e.g. engine, wind, loud talking, etc.) or too much distance to the transformer did negatively impact the measuring.
Load Noise Dominance: The recording shows no indication of a dominating load noise.
Resonance Factor: The recording was not affected by any ambient noise.
DC Estimator: The recording shows an indication of direct current influence on the transformer.

Recommendation

Signal-to-Noise Ratio: Please keep the proposed distance to the transformer when measuring (30-100 cm), minimize the ambient noise and repeat the recording.
Load Noise Dominance: -
Resonance Factor: -
DC Estimator: Please repeat the measurement at a later time to see if there is a time dependency of the direct current impact. For further clarification please get in touch with the transformer experts from Siemens Energy.