

ZONDA 9

NOISE MEASUREMENTS

AYRTON

1 Test instructions

This test was carried out in the semi-silencing room of Guangzhou Quality Supervision and Testing Institute (GQT) The indoor environmental noise was less than 5dB (A). The stage lamp was placed on the standard test table of the semi- silencing room, When the stage lamp was turned on, the test microphone was 1m away from the four directions of the stage lamp to detect its sound pressure level.

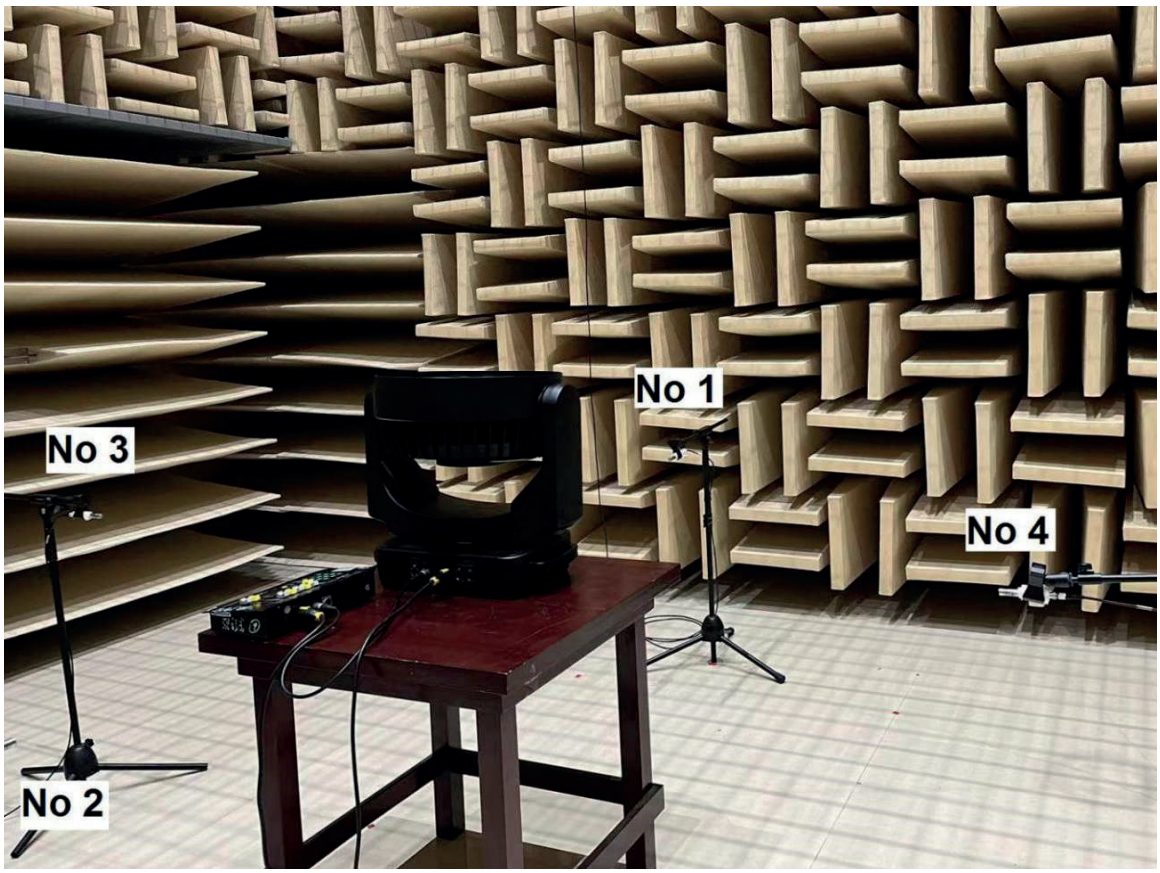

Figure 1 Test setup



Figure 2 Sample serial number information

2 Noise Detection Results of Stage Luminaires (The Auto mode)

Frequency (Hz)	Sound Pressure Level in Auto Mode (dB)							
	Static				Dynamic			
	No 1	No 2	No 3	No 4	No 1	No 2	No 3	No 4
63	18.1	17.2	18.8	16.7	21.2	19.9	21.8	18.6
80	17.6	16.8	18.3	17.2	18.1	18.4	18.2	19.0
100	19.4	20.4	21.4	18.6	20.7	22.2	22.7	20.2
125	17.0	17.9	16.9	16.6	22.7	23.5	24.2	22.2
160	19.4	21.1	19.6	19.7	24.4	26.2	25.3	24.4
200	24.3	28.6	24.8	24.5	30.5	31.9	30.5	30.9
250	30.3	31.7	30.5	30.9	41.2	43.7	42.4	43.3
315	30.6	31.9	31.0	30.3	42.9	45.6	45.1	45.8
400	30.7	30.3	28.5	28.3	45.4	43.6	44.3	43.6
500	34.4	35.9	31.5	31.2	36.0	37.4	36.4	36.3
630	41.0	38.6	39.8	39.4	41.6	41.0	41.6	40.0
800	37.4	39.4	33.5	32.3	38.6	38.9	36.7	36.3
1000	34.9	34.2	33.3	35.7	35.7	36.6	34.8	35.3
1250	31.4	31.0	31.3	30.6	32.6	33.2	32.0	32.0
1600	28.1	27.5	28.9	28.3	29.2	29.2	28.6	28.8
2000	23.8	24.0	25.3	25.2	26.3	26.4	25.0	25.3
2500	19.9	20.5	22.4	22.3	25.4	25.1	24.5	24.8
3150	18.2	18.1	22.9	21.0	24.0	23.1	23.5	23.7
4000	15.3	14.9	18.7	19.8	21.1	20.7	20.6	21.8
5000	13.0	12.5	17.2	16.5	19.5	18.2	18.4	18.6
6300	13.1	13.9	18.1	18.8	17.9	18.2	19.5	18.6
8000	10.7	12.4	12.3	13.4	15.9	16.7	18.4	17.3
10000	9.5	9.4	12.1	12.7	14.3	14.2	15.7	15.9
12500	9.2	9.3	12.5	11.5	13.8	14.6	14.2	14.6
16000	9.9	10.1	11.0	11.0	18.2	18.2	17.8	18.2
20000	24.9	25.8	26.0	27.3	37.2	36.9	36.6	37.3

Frequency (Hz)	Sound Pressure Level in Auto Mode (dB)							
	Static				Dynamic			
	No 1	No 2	No 3	No 4	No 1	No 2	No 3	No 4
Leq	45.7	45.4	44.6	44.2	50.6	51.1	50.8	50.9
A-weighted dB (A)	43.2	43.0	41.8	41.8	46.4	46.6	46.1	45.9
Average sound pressure level dB (A)	42.5				46.3			

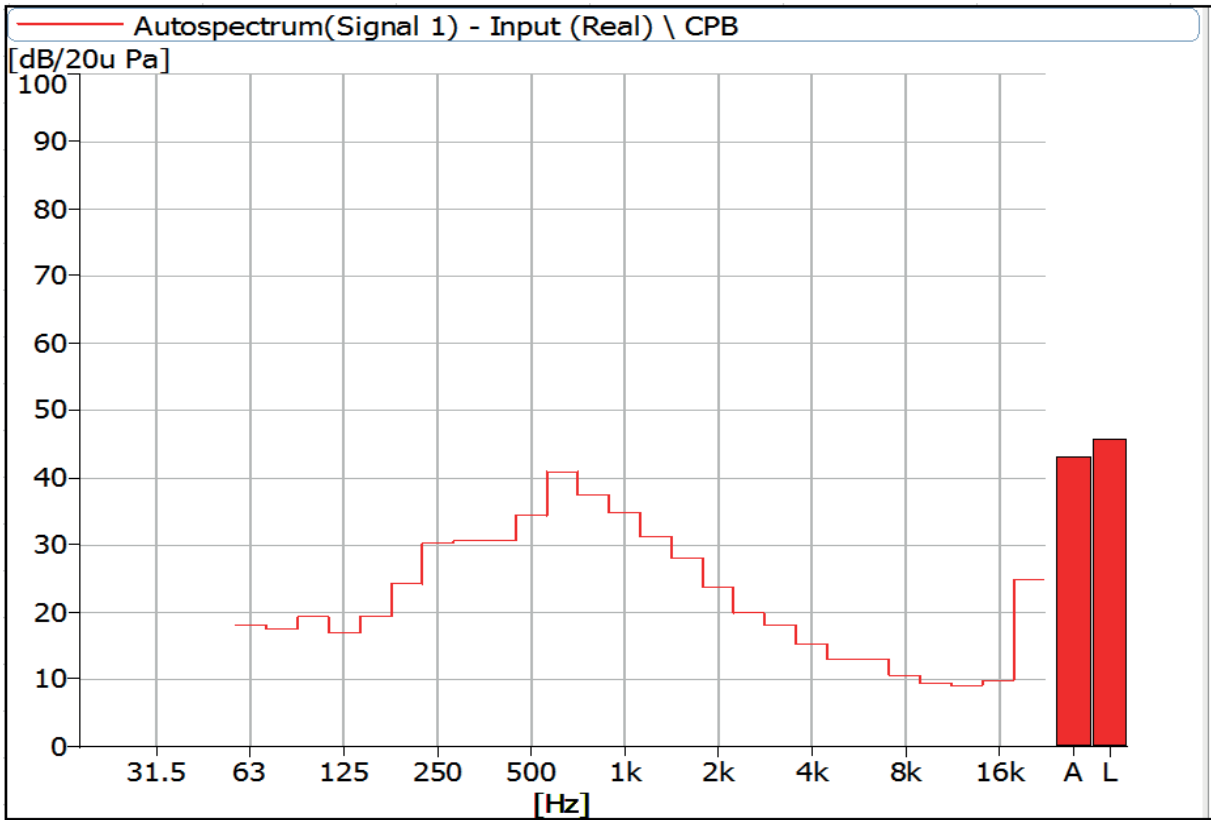

Figure 3 Noise Spectrum of Stage Luminaires (The Auto mode, Static, No 1)

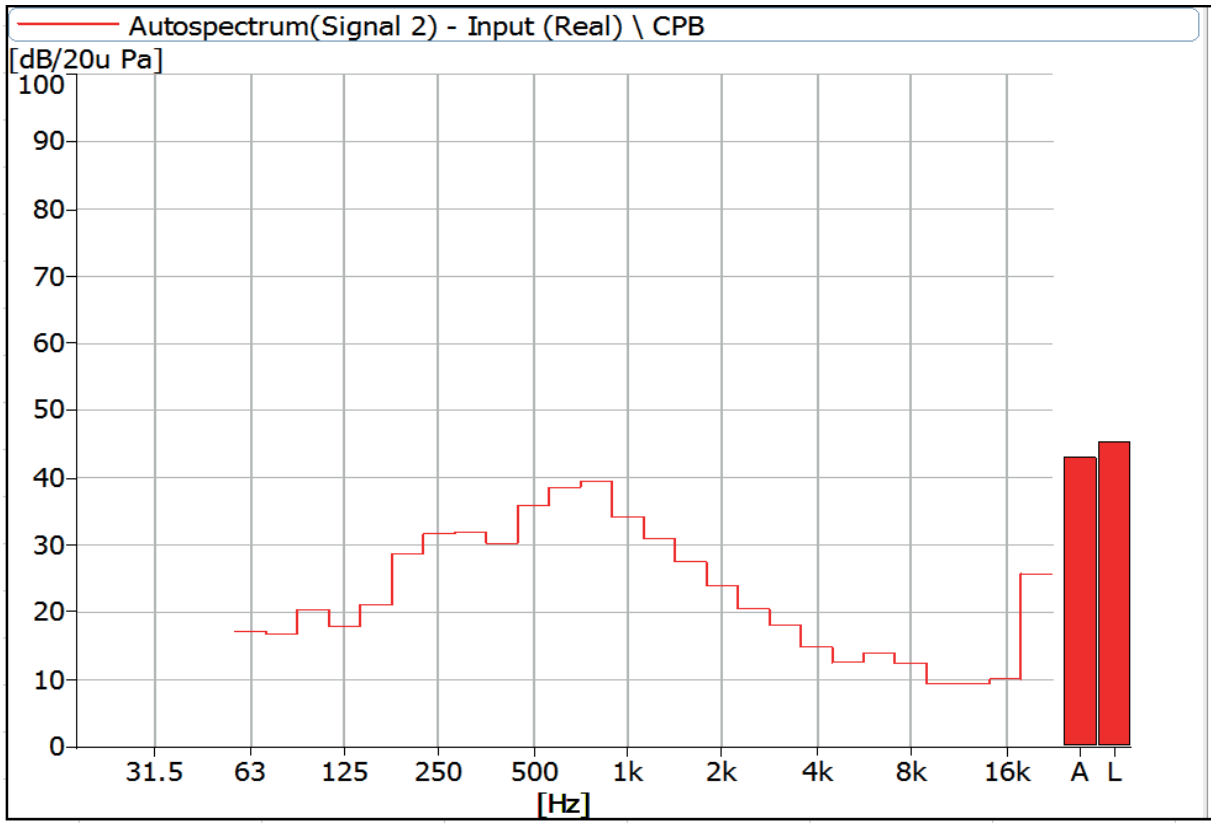

Figure 4 Noise Spectrum of Stage Luminaires (The Auto mode, Static, No 2)

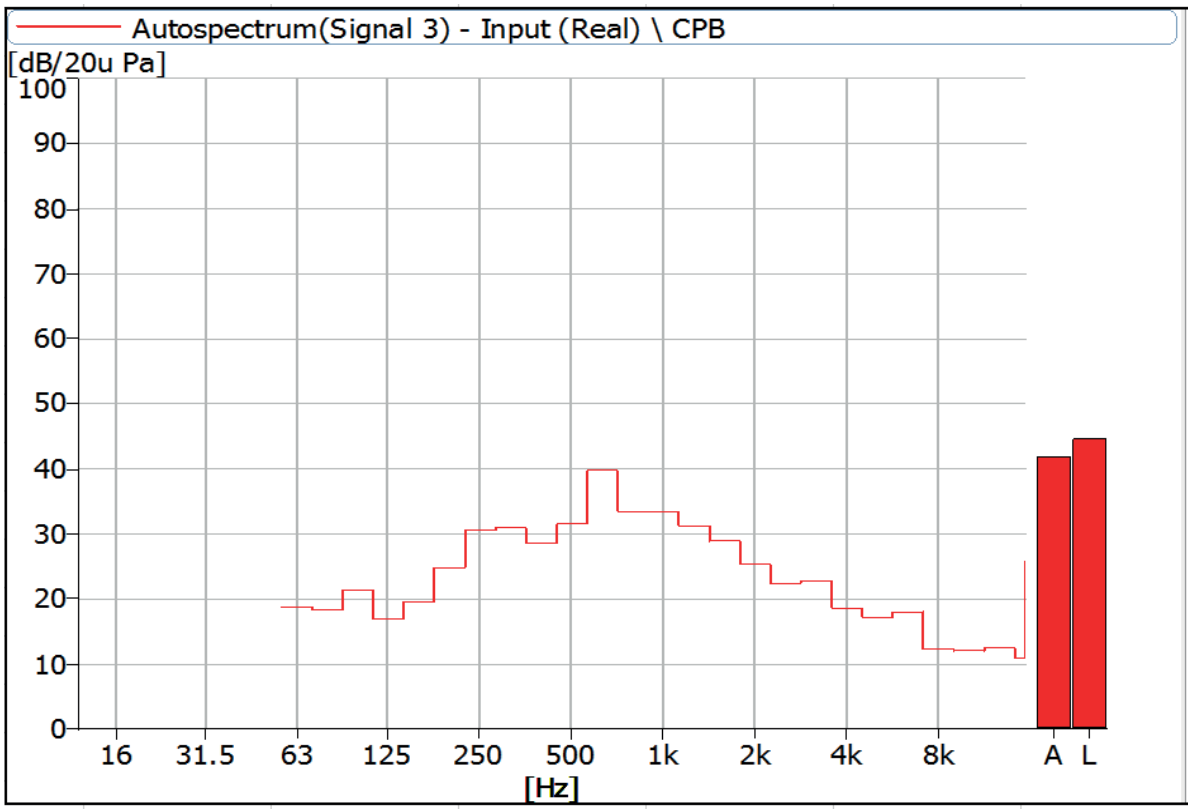

Figure 5 Noise Spectrum of Stage Luminaires (The Auto mode, Static, No 3)

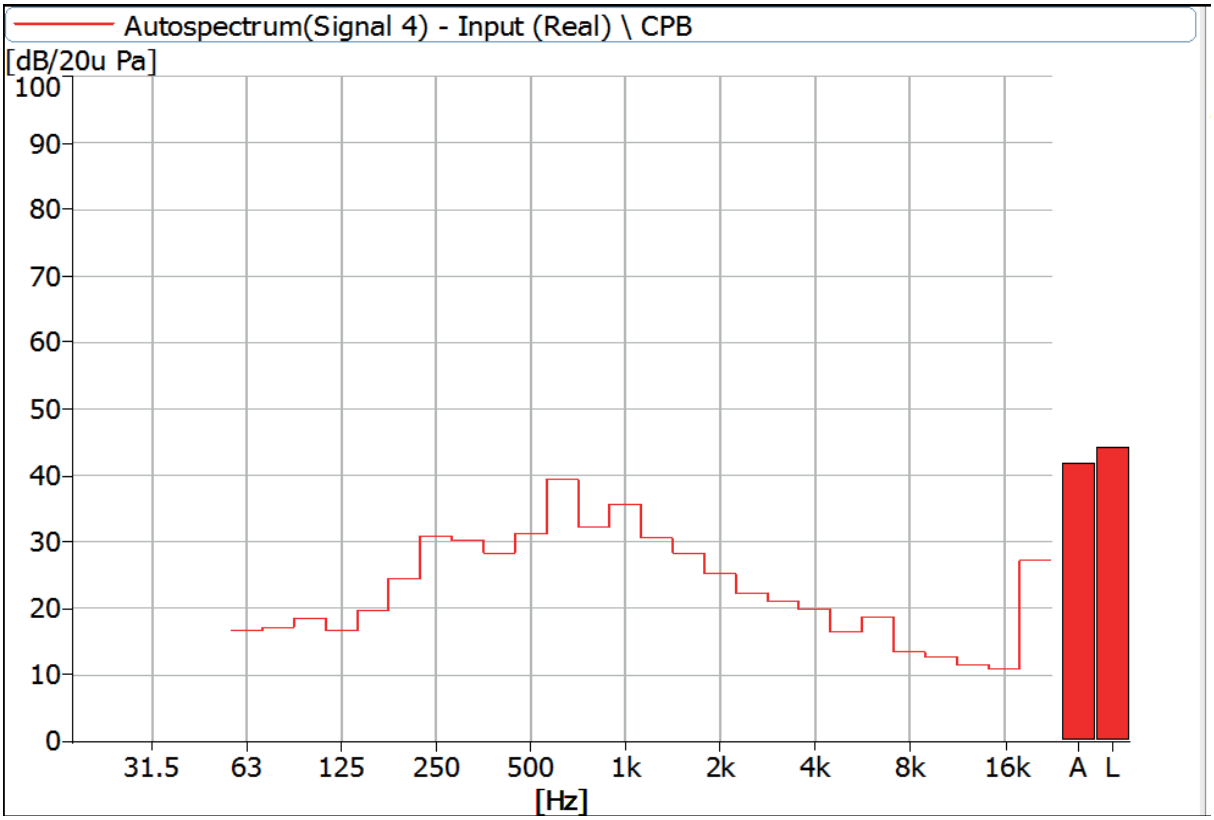

Figure 6 Noise Spectrum of Stage Luminaires (The Auto mode, Static, No 4)

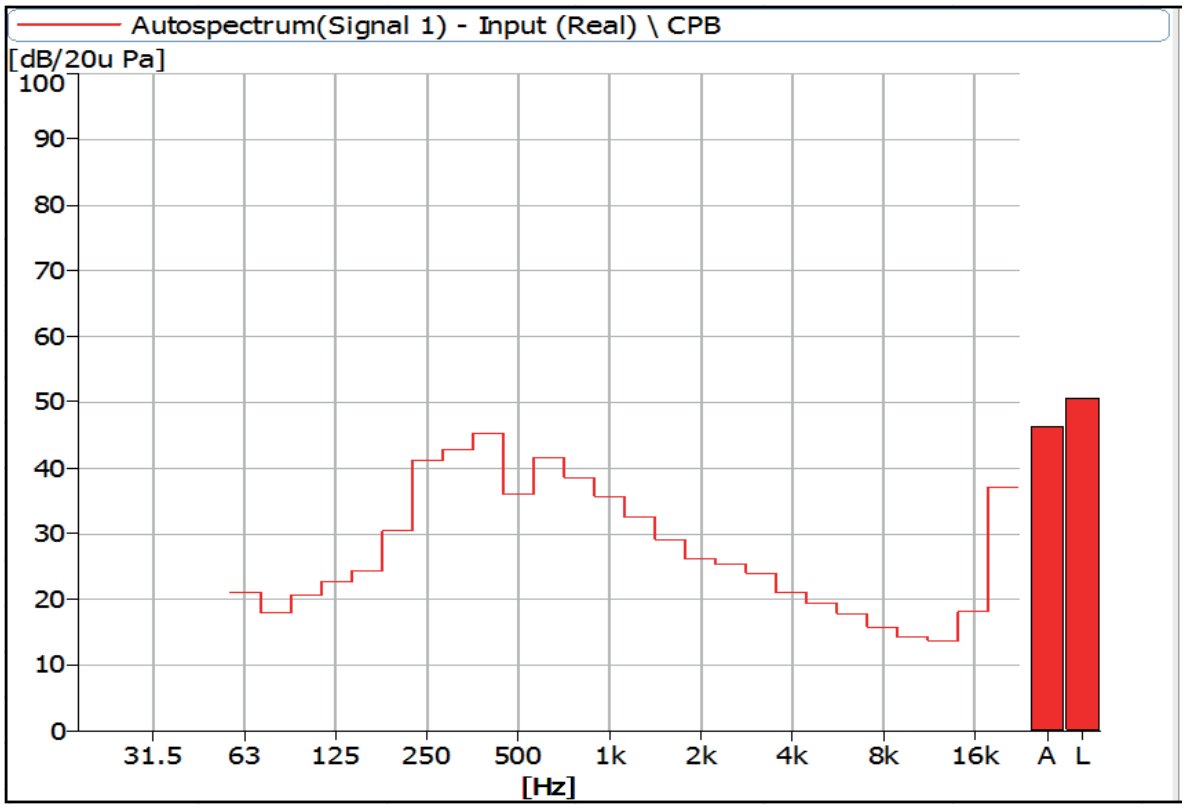

Figure 7 Noise Spectrum of Stage Luminaires (The Auto mode, Dynamic, No 1)

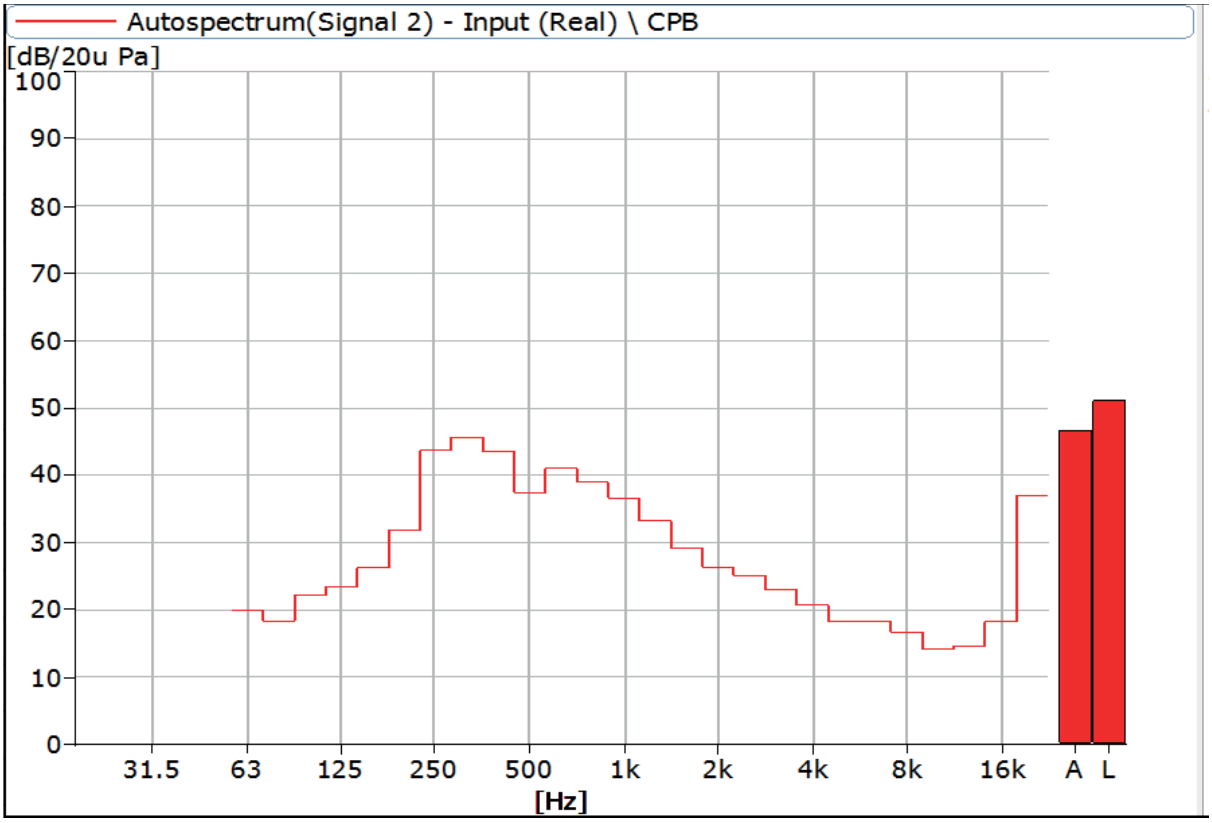

Figure 8 Noise Spectrum of Stage Luminaires (The Auto mode, Dynamic, No 2)

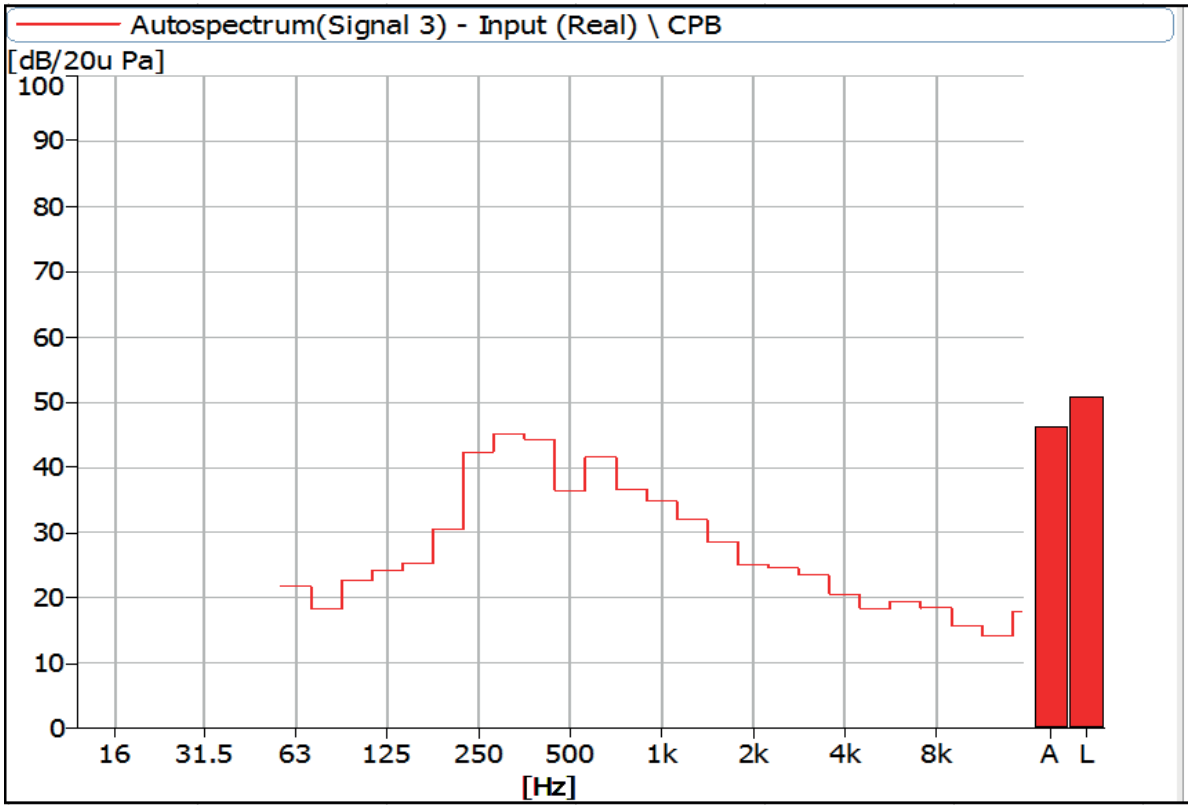

Figure 9 Noise Spectrum of Stage Luminaires (The Auto mode, Dynamic, No 3)

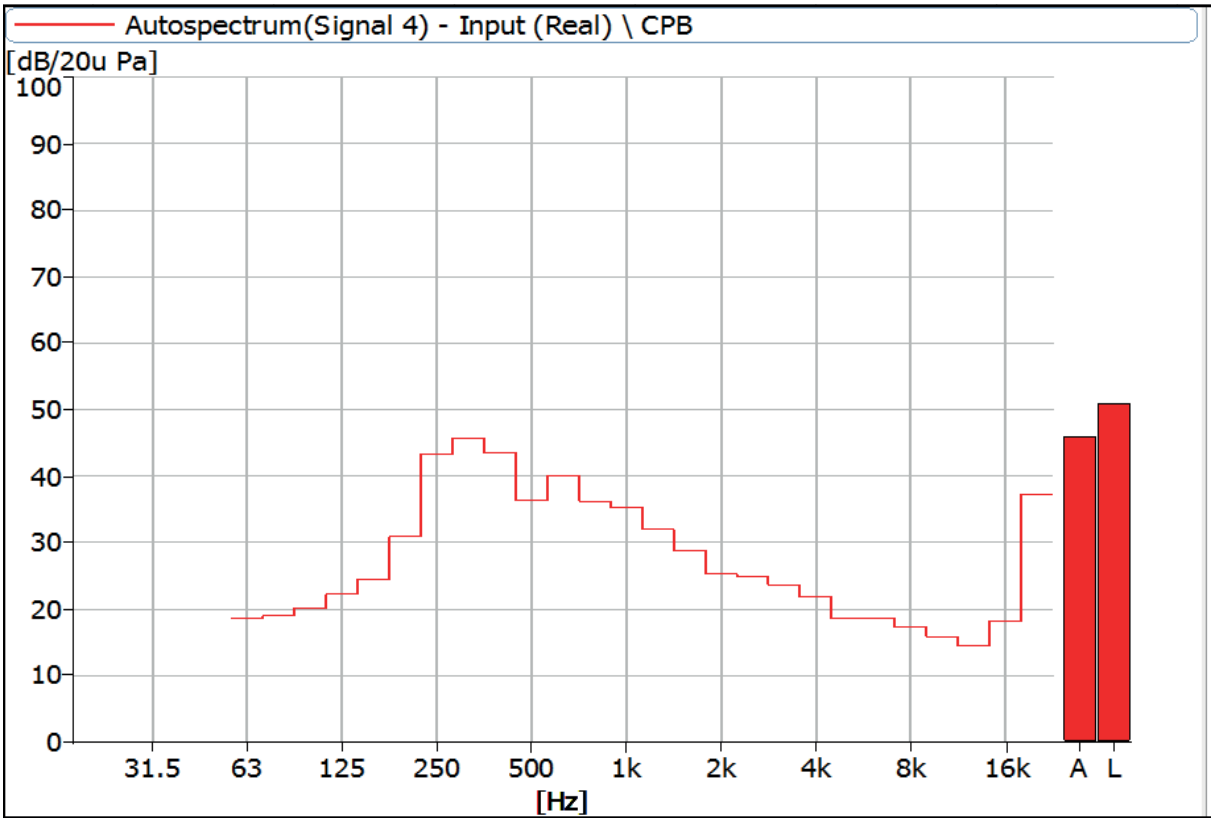

Figure 10 Noise Spectrum of Stage Luminaires (The Auto mode, Dynamic, No 4)

3 Noise Detection Results of Stage Luminaires (The Stage mode)

Frequency (Hz)	Sound Pressure Level in Auto Mode (dB)							
	Static				Dynamic			
	No 1	No 2	No 3	No 4	No 1	No 2	No 3	No 4
63	20.4	20.0	21.3	19.0	23.8	22.2	23.6	21.0
80	19.2	18.8	19.7	19.5	20.3	20.0	20.6	21.3
100	21.5	22.0	22.2	21.3	22.6	22.6	24.0	22.6
125	20.5	21.1	20.0	19.1	24.4	25.4	25.8	24.3
160	23.0	24.9	23.3	23.1	26.5	28.3	26.9	26.6
200	32.1	32.2	28.6	29.5	34.0	35.8	33.9	34.2
250	35.0	36.6	32.0	32.4	41.9	44.3	42.8	43.9
315	39.9	43.7	41.4	41.7	44.5	46.1	45.6	46.5
400	39.7	38.2	38.4	37.2	45.7	44.4	44.6	44.9
500	43.9	45.2	40.4	40.7	42.2	43.2	41.8	41.4
630	48.7	47.4	48.9	49.0	44.3	44.2	44.8	43.7
800	45.8	47.4	42.0	41.5	44.2	44.7	41.6	41.6
1000	42.8	42.9	42.1	42.5	42.0	41.9	41.3	40.8
1250	38.6	39.1	39.2	38.6	38.9	38.5	38.2	38.4
1600	38.0	37.5	38.7	38.5	36.7	36.4	36.4	36.2
2000	33.6	34.2	34.3	34.4	34.1	33.4	33.1	32.7
2500	30.0	30.8	32.1	32.2	31.8	30.3	31.3	31.1
3150	28.4	27.6	32.6	31.7	30.9	29.0	30.6	30.3
4000	25.0	24.6	28.8	29.2	27.5	26.1	27.7	27.8
5000	22.2	21.9	26.4	26.9	25.5	24.0	24.9	24.6
6300	19.0	19.1	24.0	23.9	22.7	22.5	23.5	22.7
8000	15.6	15.2	18.9	19.0	19.3	19.3	19.4	19.6
10000	12.0	11.5	16.0	16.2	17.8	17.0	17.4	17.7
12500	10.6	10.6	14.3	14.2	17.4	16.2	15.8	16.3
16000	12.1	9.5	12.8	12.0	19.7	18.7	18.6	18.6
20000	30.6	17.8	29.3	26.6	37.7	37.0	37.2	37.5

Frequency (Hz)	Sound Pressure Level in Auto Mode (dB)							
	Static				Dynamic			
	No 1	No 2	No 3	No 4	No 1	No 2	No 3	No 4
Leq	53.1	53.4	52.4	52.3	53.0	53.3	52.8	53.0
A-weighted dB(A)	51.4	51.7	50.7	50.7	50.3	50.3	49.7	49.5
Average sound pressure level dB(A)	51.1				50.0			

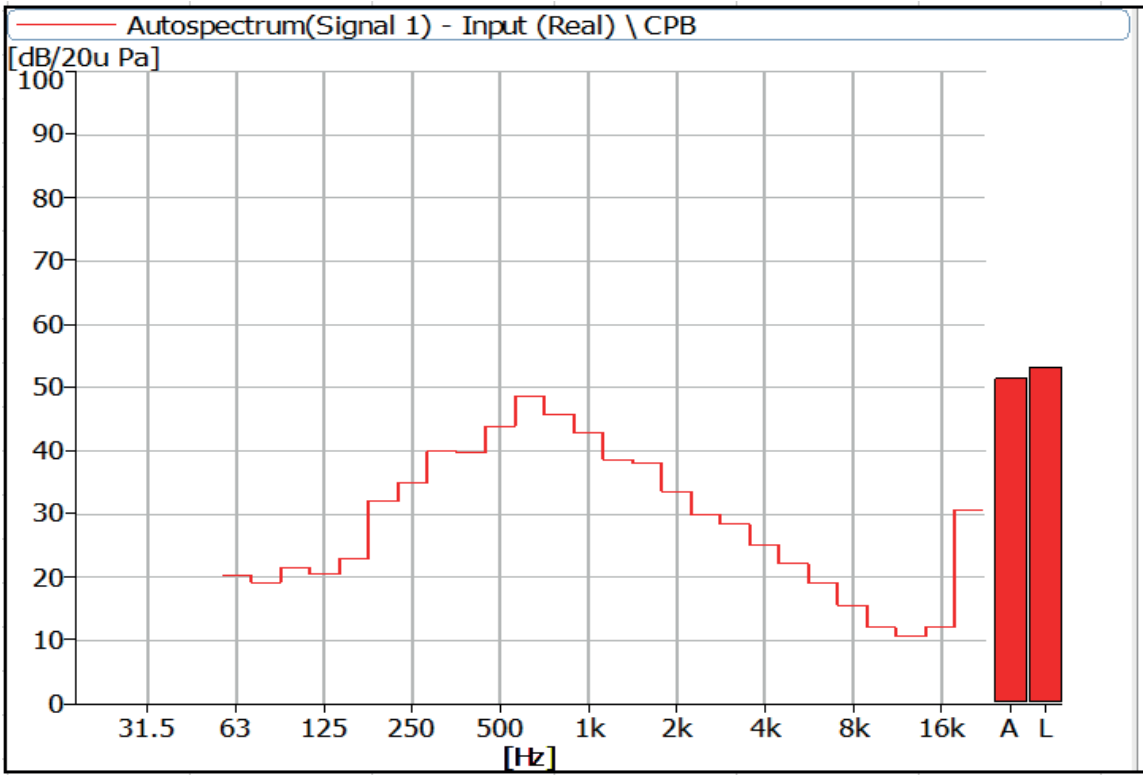

Figure 11 Noise Spectrum of Stage Luminaires (The Stage mode, Static, No 1)

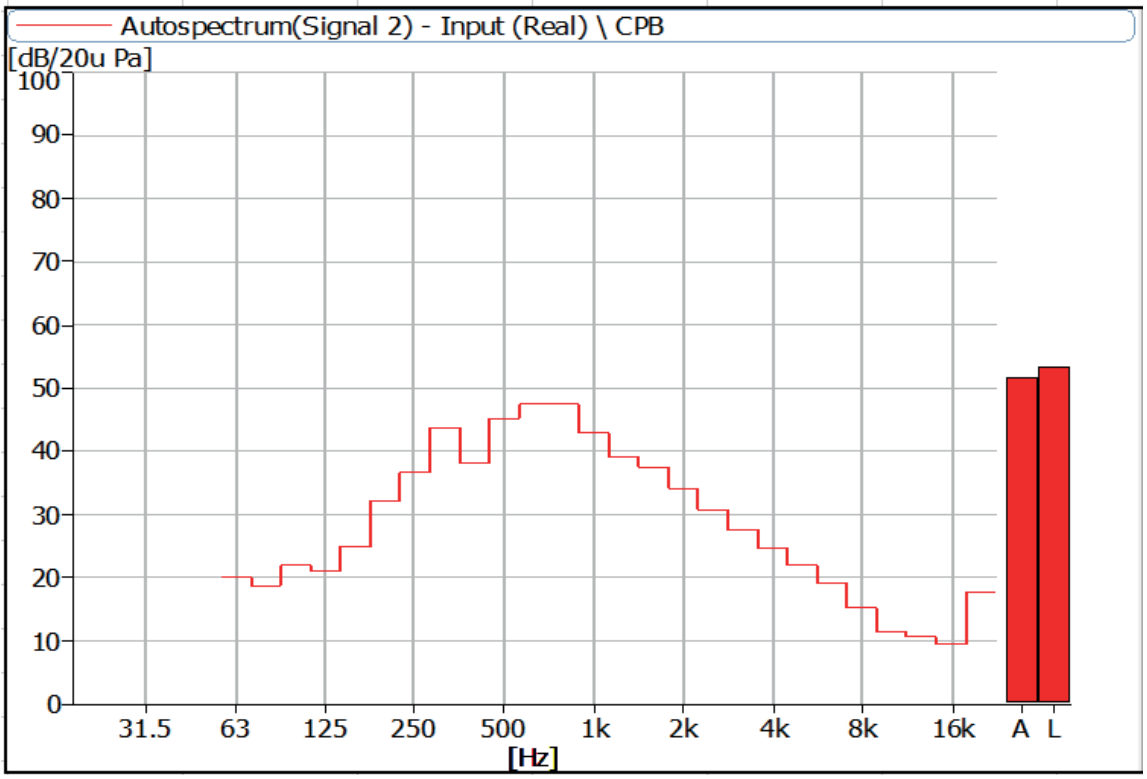

Figure 12 Noise Spectrum of Stage Luminaires (The Stage mode, Static, No 2)

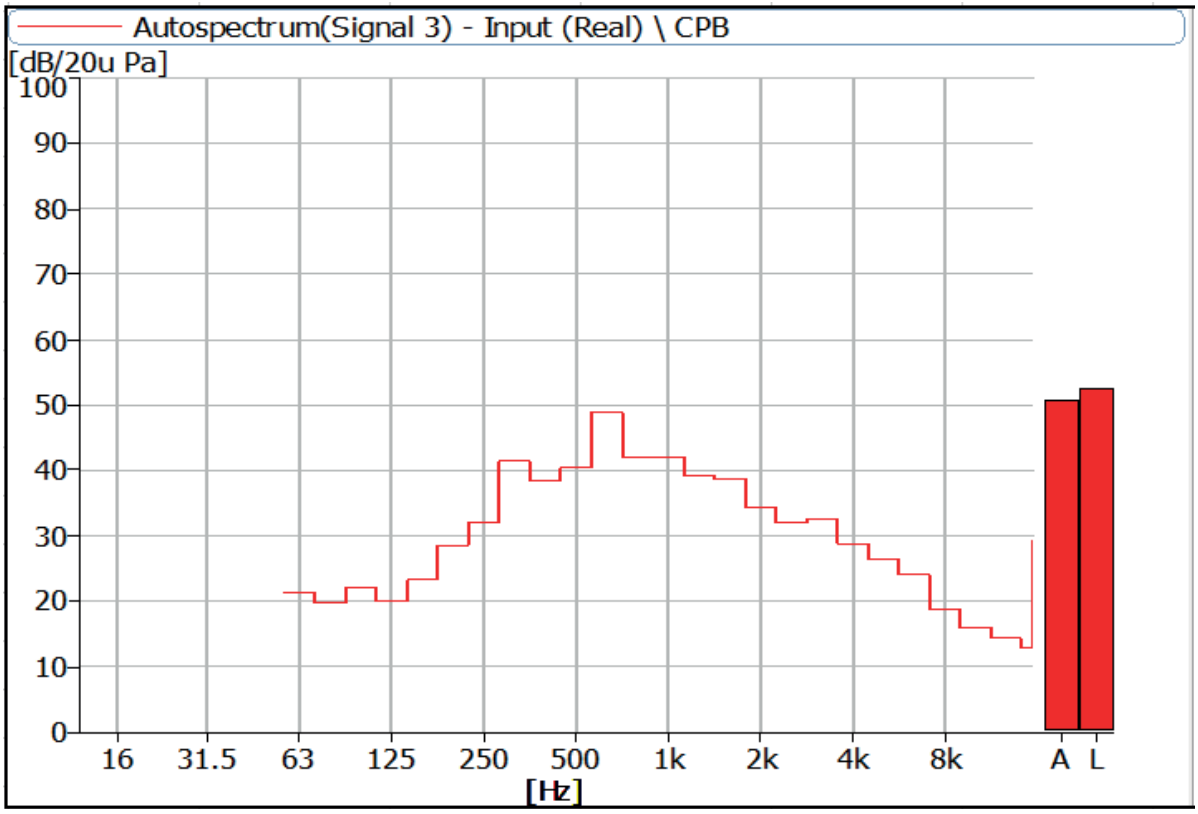

Figure 13 Noise Spectrum of Stage Luminaires (The Stage mode, Static, No 3)

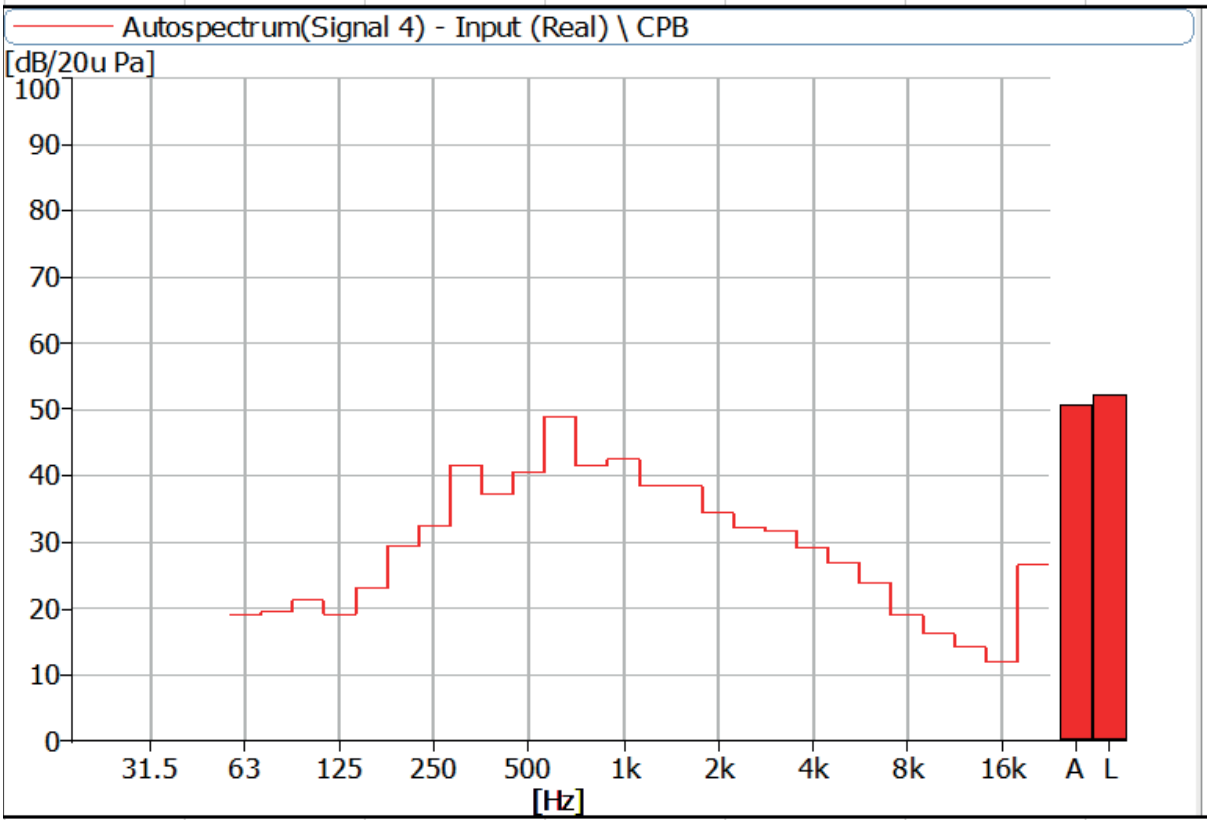

Figure 14 Noise Spectrum of Stage Luminaires (The Stage mode, Static, No 4)

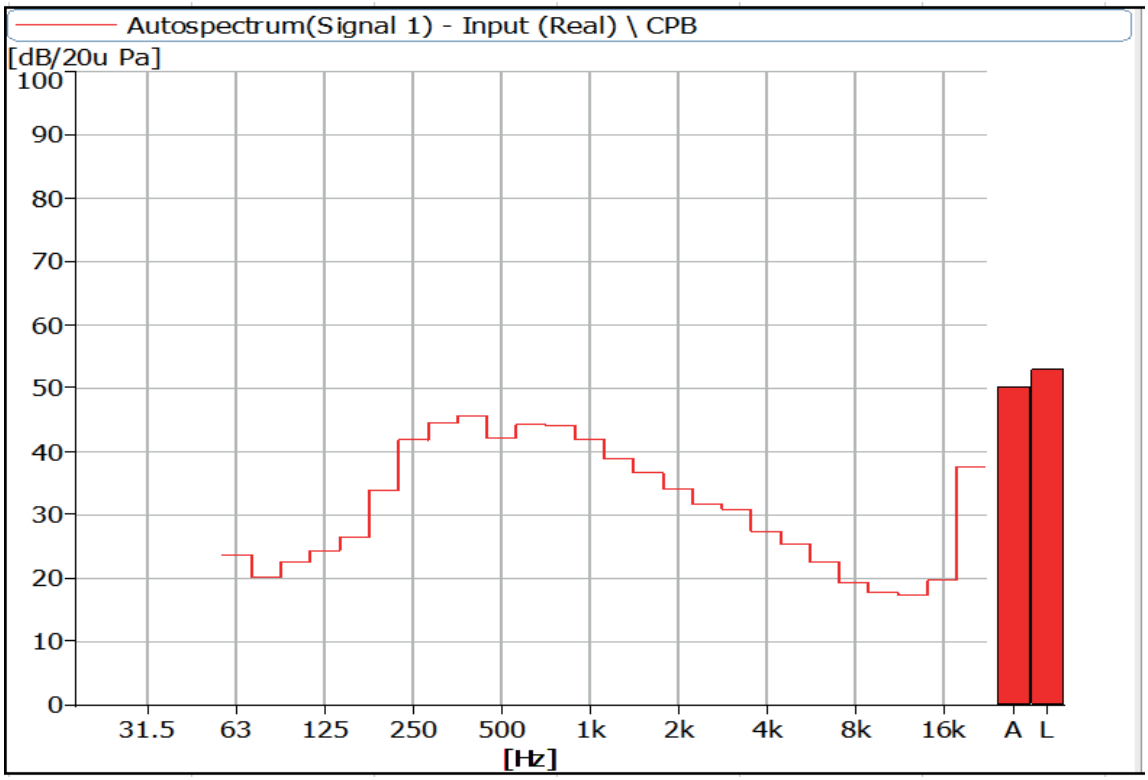

Figure 15 Noise Spectrum of Stage Luminaires (The Stage mode, Dynamic, No 1)

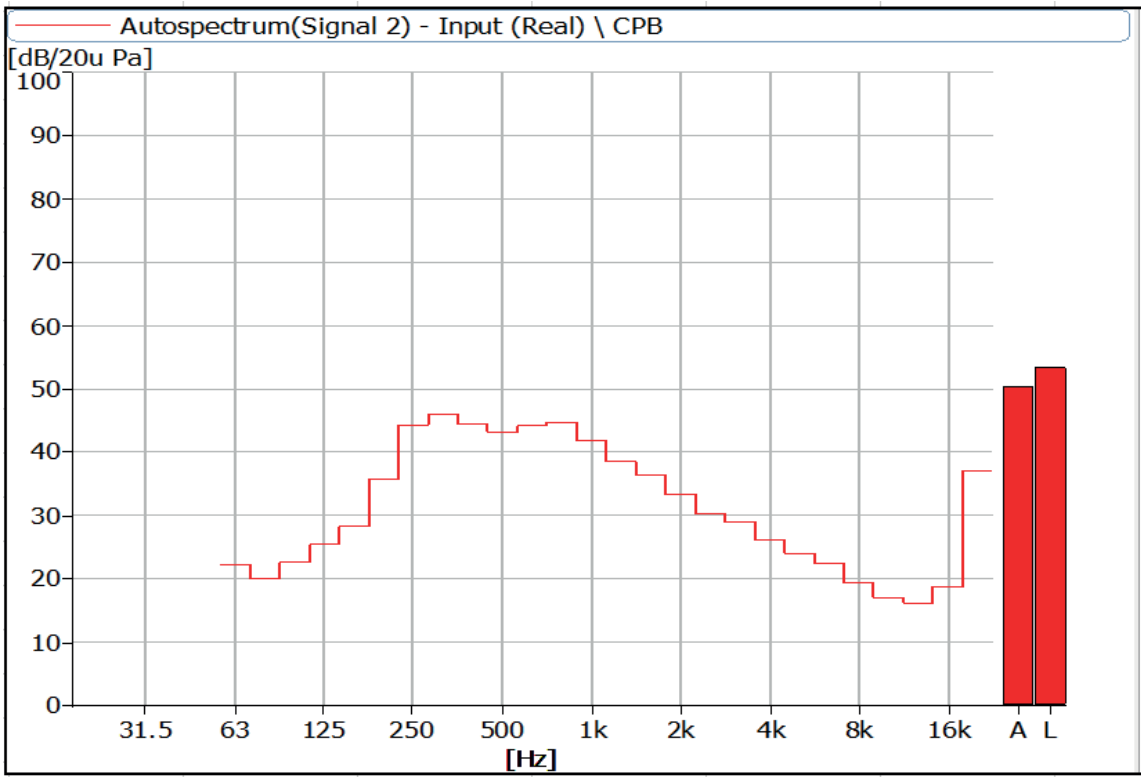

Figure 16 Noise Spectrum of Stage Luminaires (The Stage mode, Dynamic, No 2)

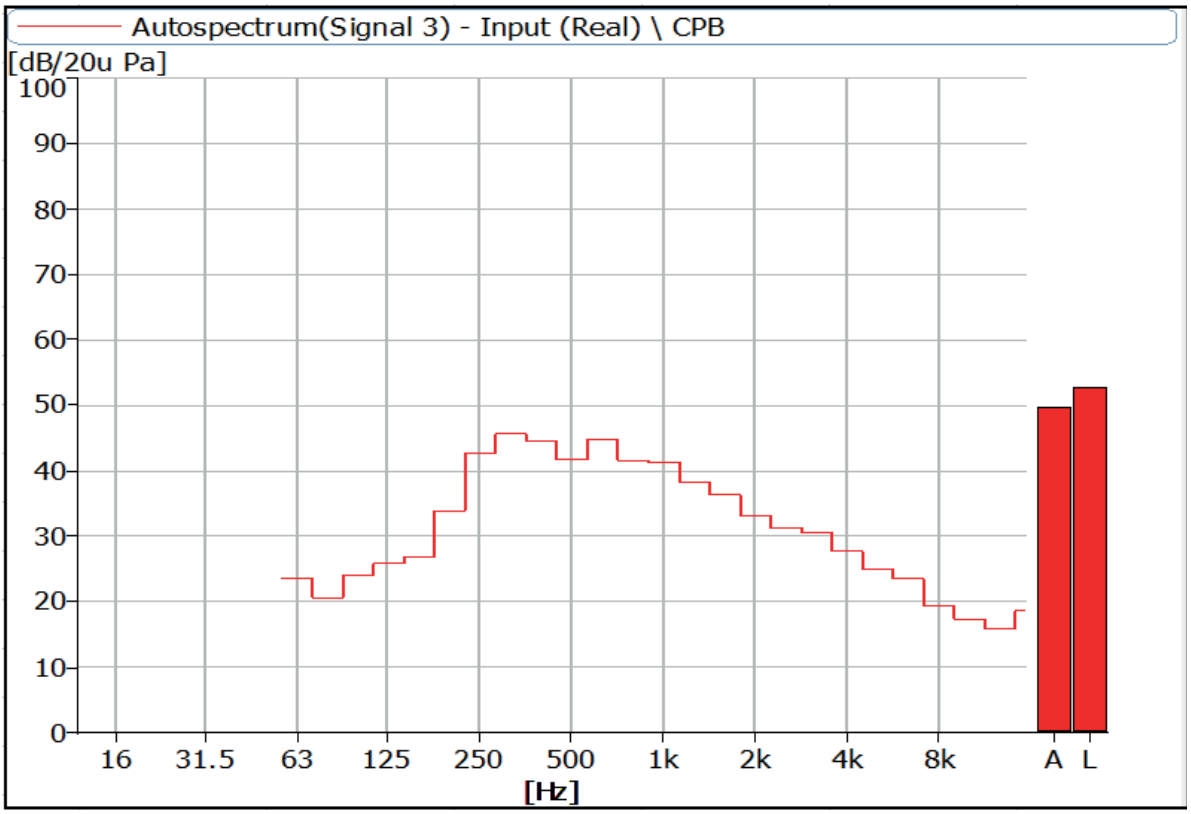

Figure 17 Noise Spectrum of Stage Luminaires (The Stage mode, Dynamic, No 3)

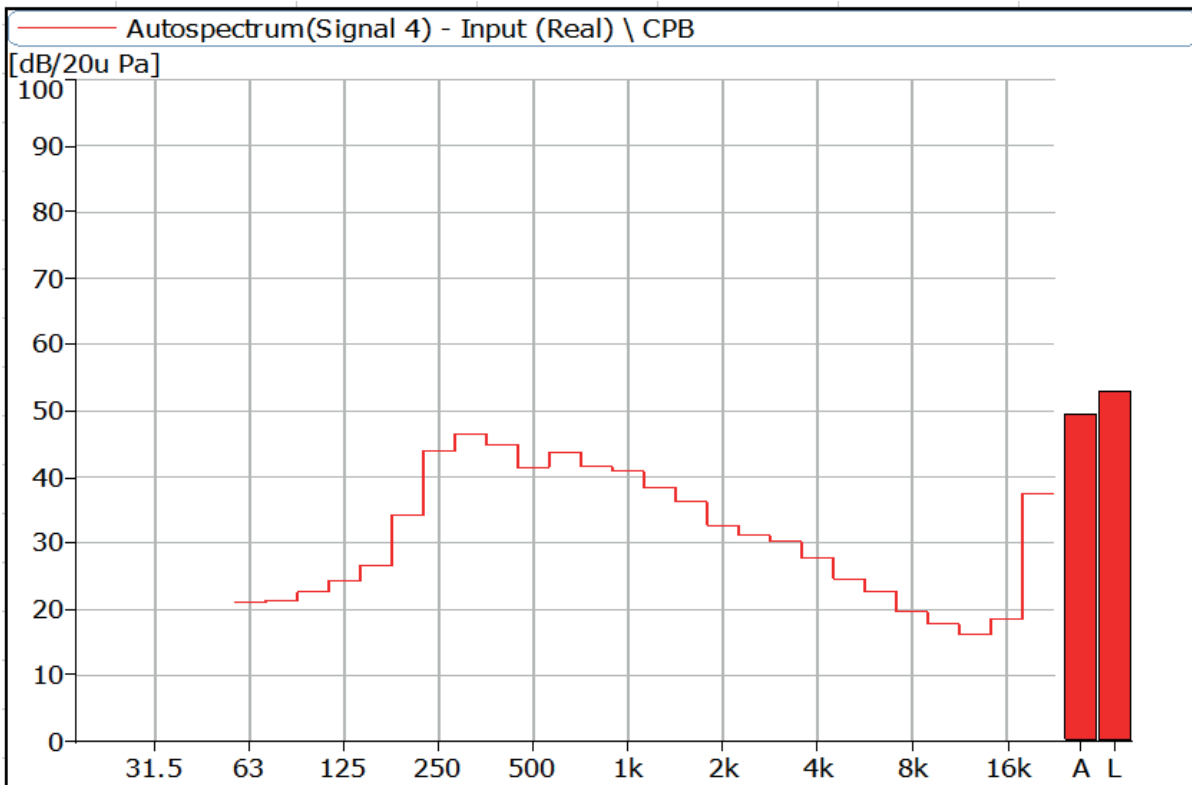

Figure 18 Noise Spectrum of Stage Luminaires (The Stage mode, Dynamic, No 4)

4 Noise Detection Results of Stage Luminaires (The Silence mode)

Frequency (Hz)	Sound Pressure Level in Auto Mode (dB)							
	Static				Dynamic			
	No 1	No 2	No 3	No 4	No 1	No 2	No 3	No 4
63	16.9	16.5	17.6	15.2	20.4	19.5	21.2	17.4
80	15.6	15.3	16.4	15.1	17.2	17.9	17.6	18.4
100	19.0	19.7	20.5	17.1	20.6	21.3	22.8	19.7
125	15.2	15.7	14.7	15.0	23.8	24.8	25.9	23.7
160	17.8	19.9	19.8	17.7	24.0	25.2	25.0	23.2
200	21.3	23.5	21.7	21.4	30.1	31.5	30.4	30.6
250	24.5	26.9	26.4	25.8	41.3	43.3	42.3	43.2
315	25.5	25.6	23.6	22.9	43.2	45.6	45.1	46.2
400	25.2	24.6	23.4	22.6	46.3	44.9	44.9	44.6
500	30.4	32.2	27.3	26.0	34.1	35.6	35.2	34.9
630	37.1	34.4	34.3	32.7	35.6	35.2	35.5	35.5
800	35.7	35.0	32.6	30.9	35.4	35.5	33.0	34.0
1000	32.5	29.8	32.4	32.6	34.6	35.1	33.1	33.8
1250	26.6	26.3	27.0	26.3	28.7	30.1	29.8	29.1
1600	22.8	22.2	23.1	23.0	25.6	25.2	25.2	24.5
2000	18.6	19.9	22.9	21.9	26.4	26.1	25.1	25.0
2500	15.6	17.2	18.6	18.1	24.8	23.7	26.0	24.8
3150	14.8	15.1	19.1	17.4	25.6	24.4	25.2	25.2
4000	30.4	32.2	27.3	26.0	34.1	35.6	35.2	34.9
5000	37.1	34.4	34.3	32.7	35.6	35.2	35.5	35.5
6300	35.7	35.0	32.6	30.9	35.4	35.5	33.0	34.0
8000	32.5	29.8	32.4	32.6	34.6	35.1	33.1	33.8
10000	10.5	9.9	11.8	13.0	19.3	14.3	17.8	17.6
12500	8.9	9.7	11.1	9.7	16.7	14.5	15.7	17.3
16000	10.8	11.1	12.0	9.7	19.6	17.7	18.3	18.7
20000	27.6	29.4	30.1	25.2	37.8	37.2	37.7	37.7

Frequency (Hz)	Sound Pressure Level in Auto Mode (dB)							
	Static				Dynamic			
	No 1	No 2	No 3	No 4	No 1	No 2	No 3	No 4
Leq	42.3	41.3	41.3	39.8	50.3	50.6	50.4	50.7
A-weighted dB(A)	39.9	38.7	38.4	37.5	45.2	45.3	44.9	45.1
Average sound pressure level dB(A)	38.6				45.1			

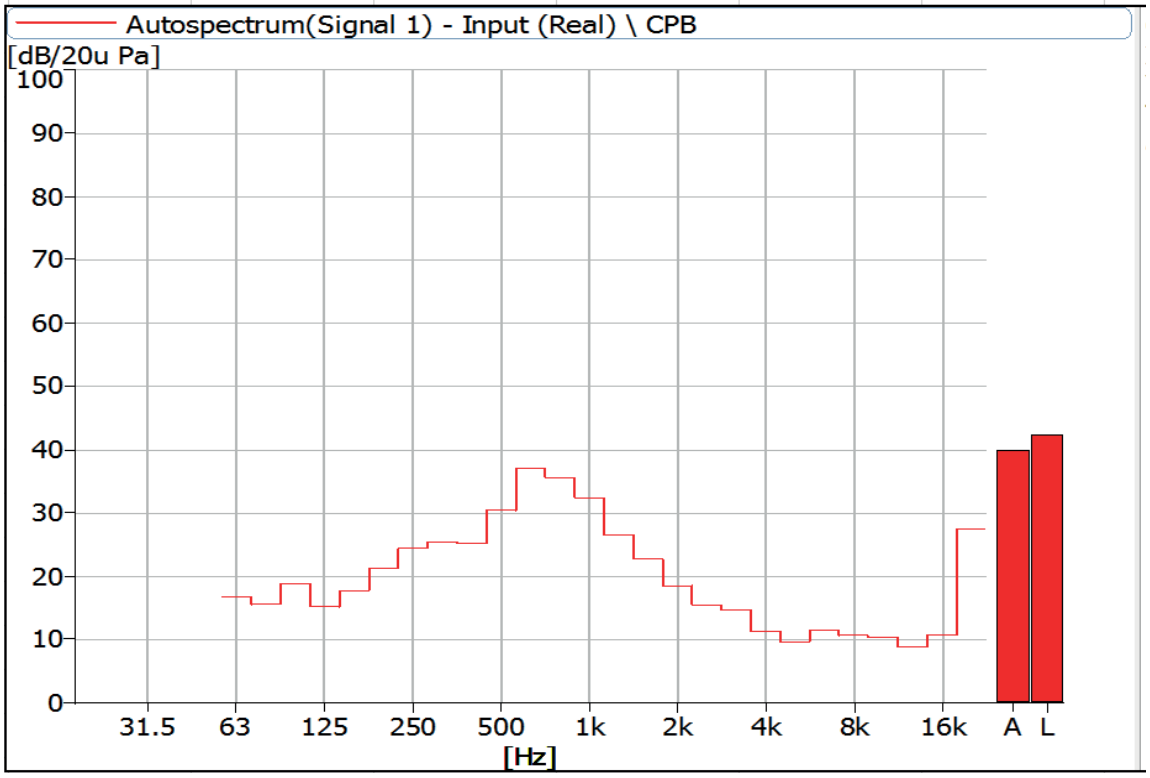

Figure 19 Noise Spectrum of Stage Luminaires (The Silence mode, Static, No 1)

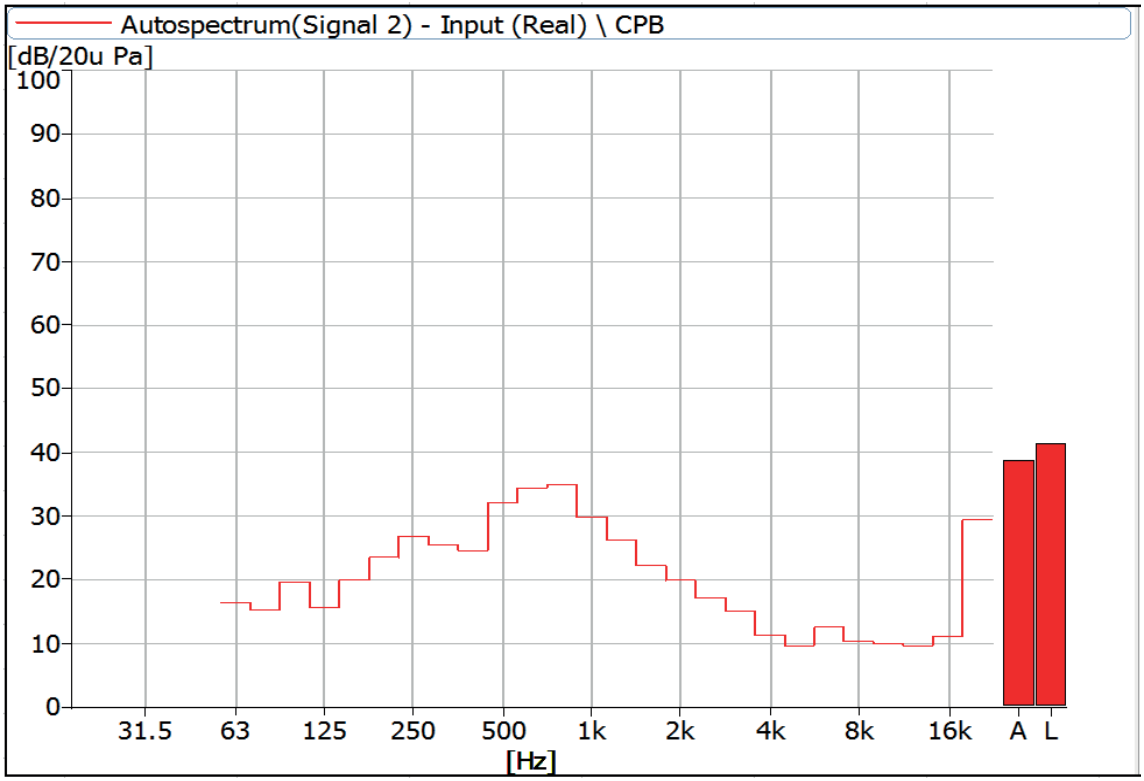

Figure 20 Noise Spectrum of Stage Luminaires (The Silence mode, Static, No 2)

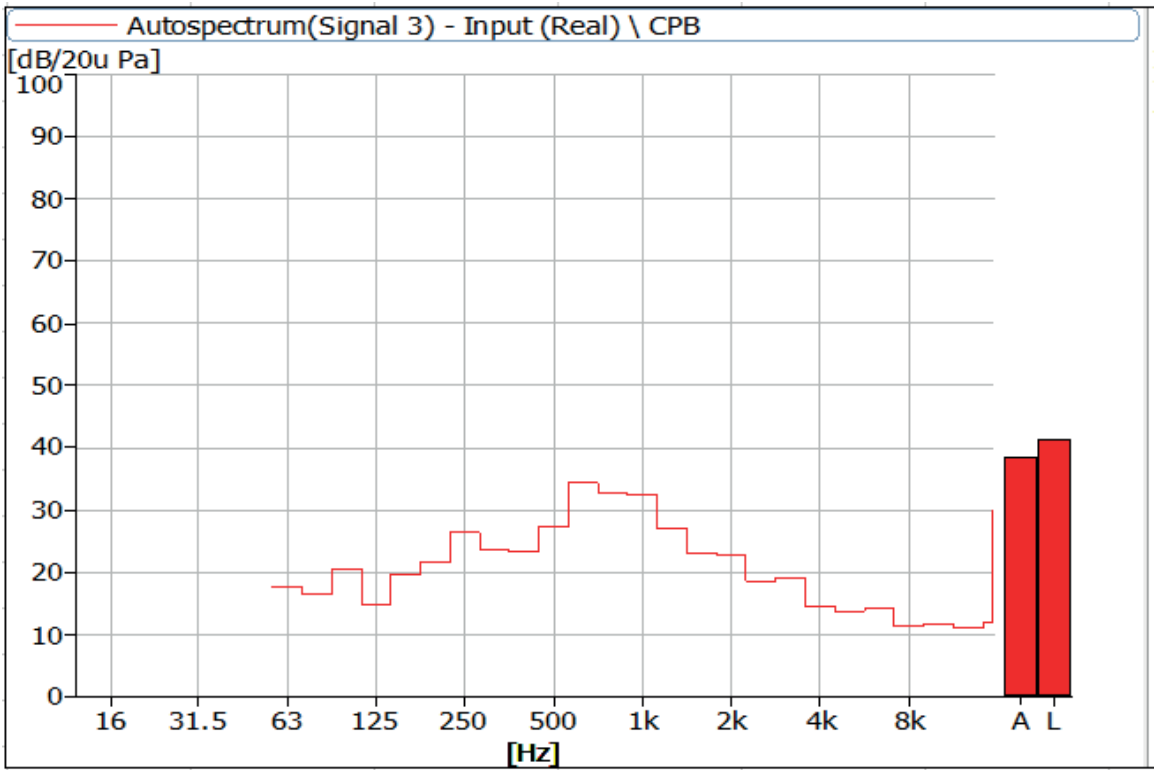

Figure 21 Noise Spectrum of Stage Luminaires (The Silence mode, Static, No 3)

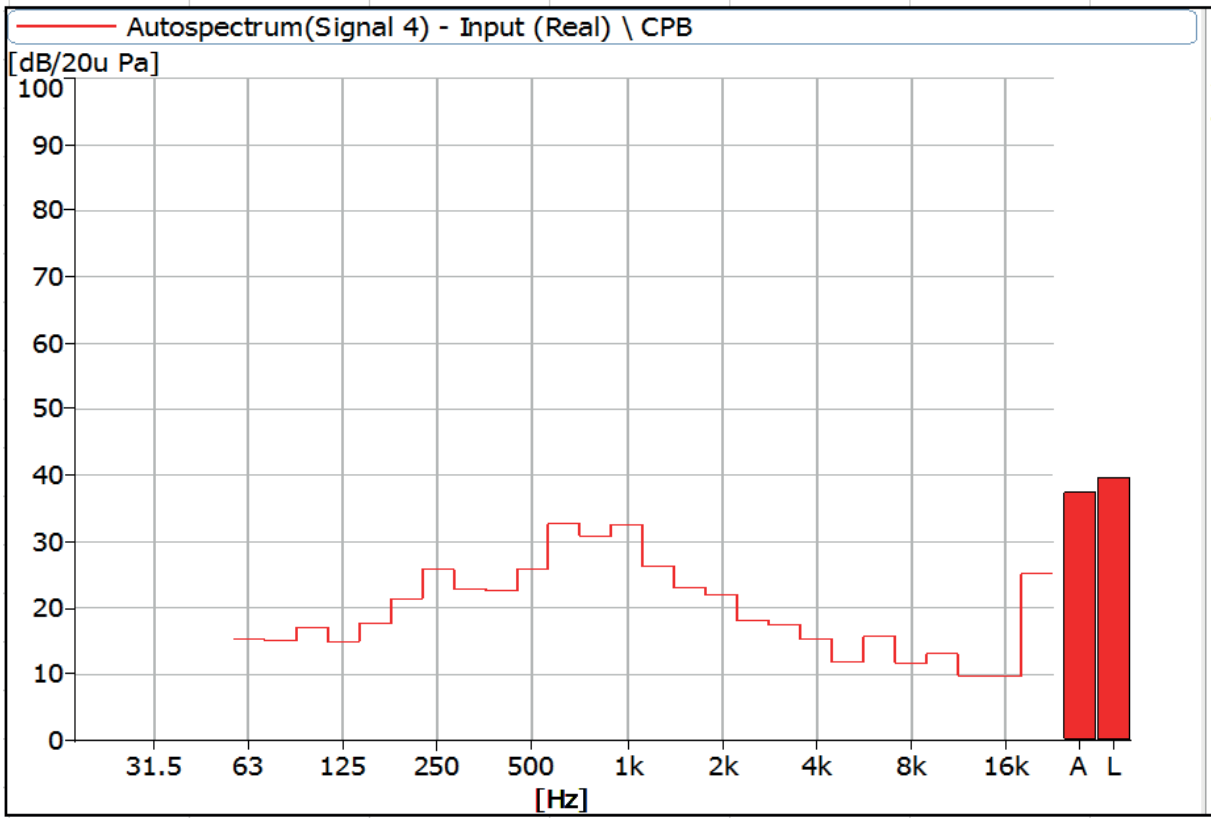

Figure 22 Noise Spectrum of Stage Luminaires (The Silence mode, Static, No 4)

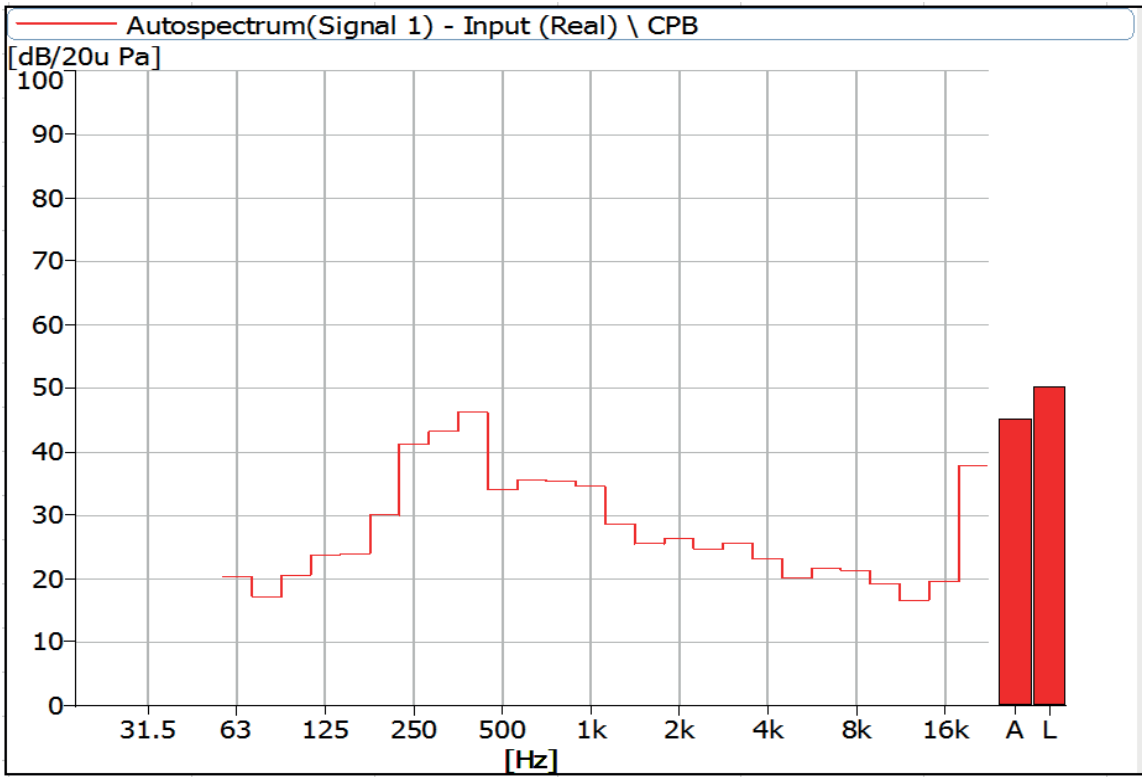

Figure 23 Noise Spectrum of Stage Luminaires (The Silence mode, Dynamic, No 1)

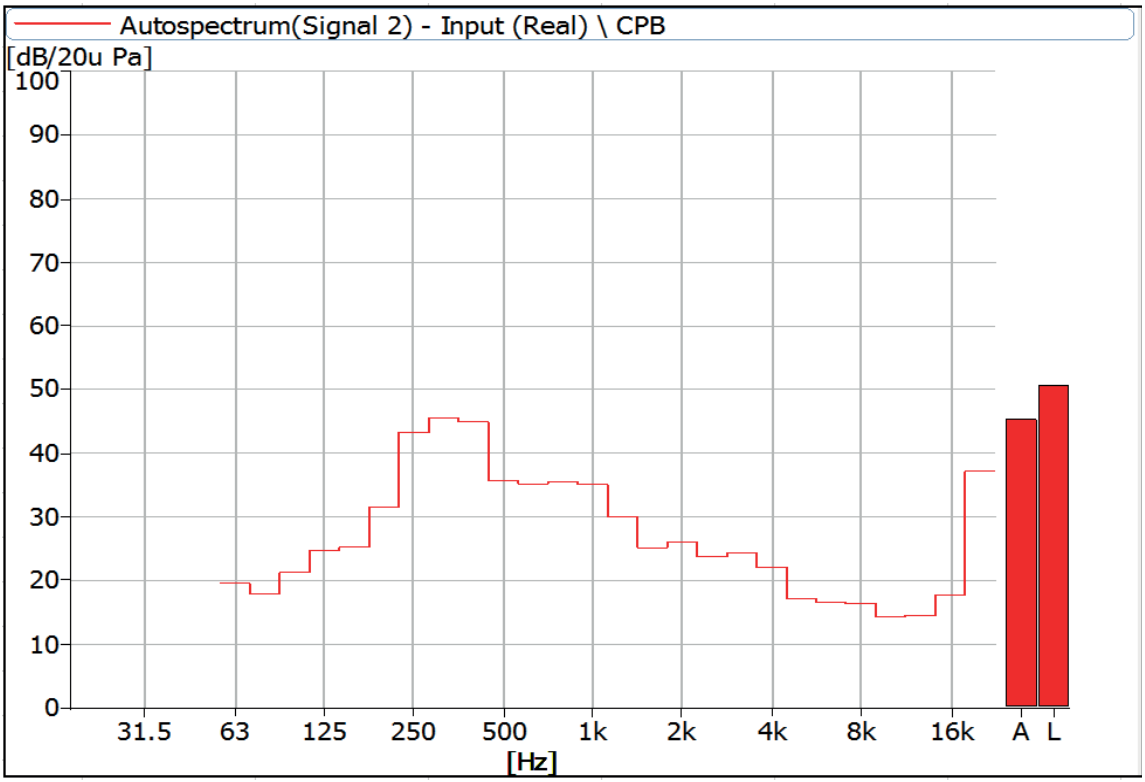

Figure 24 Noise Spectrum of Stage Luminaires (The Silence mode, Dynamic, No 2)

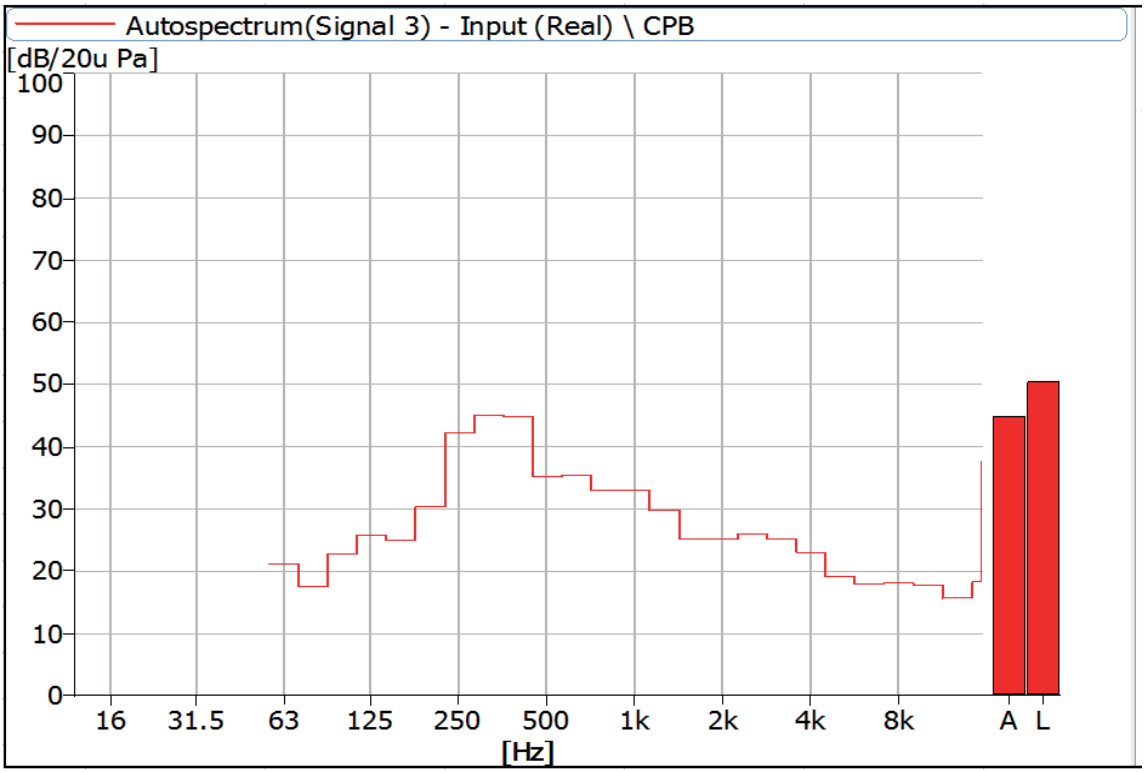

Figure 25 Noise Spectrum of Stage Luminaires (The Silence mode, Dynamic, No 3)

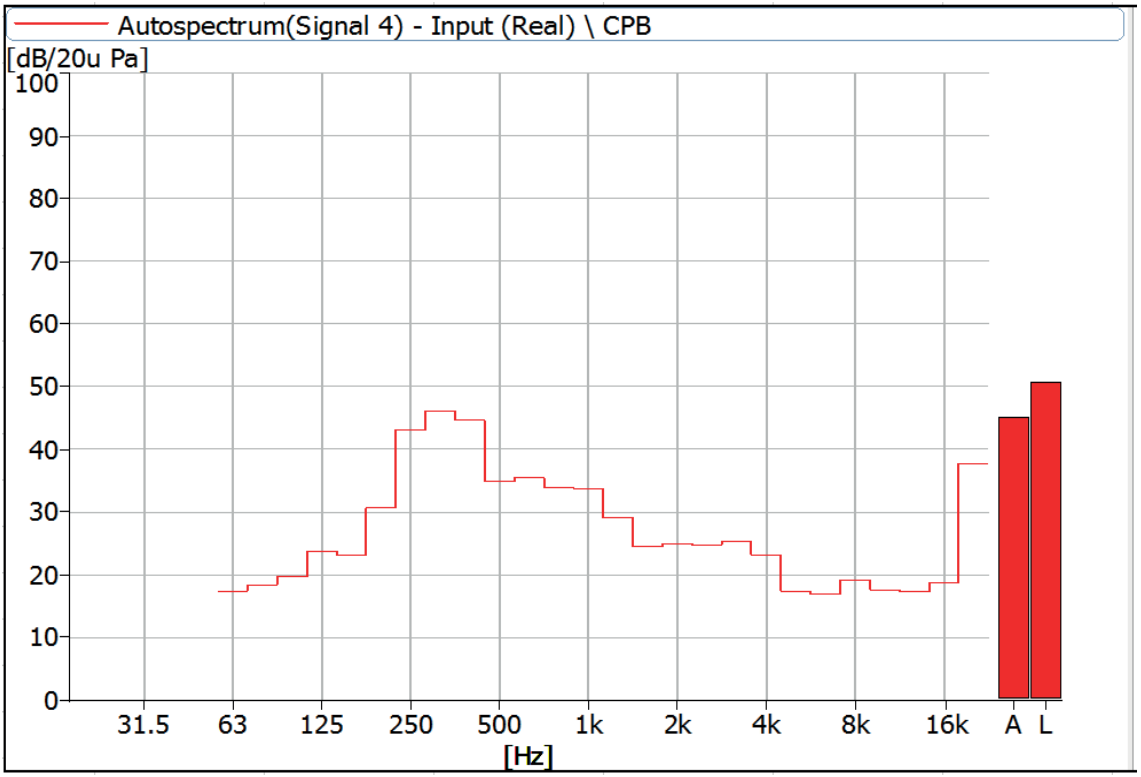

Figure 26 Noise Spectrum of Stage Luminaires (The Silence mode, Dynamic, No 4)

5 Noise Detection Results of Stage Luminaires (The Super Silence mode)

Frequency (Hz)	Sound Pressure Level in Auto Mode (dB)							
	Static				Dynamic			
	No 1	No 2	No 3	No 4	No 1	No 2	No 3	No 4
63	14.8	14.3	15.8	14.4	20.0	18.5	20.3	17.0
80	13.9	13.3	15.1	15.2	16.8	17.8	17.0	18.3
100	17.9	20.2	20.8	15.9	20.3	22.0	22.4	19.2
125	12.8	13.0	13.5	13.4	23.5	24.9	26.1	23.9
160	14.1	17.1	17.4	15.8	23.7	24.9	24.6	23.0
200	17.2	21.4	19.4	20.0	30.3	31.8	30.6	31.0
250	16.8	19.5	19.1	18.8	41.2	43.3	42.1	43.2
315	17.2	19.8	20.1	20.3	43.0	45.7	44.8	46.4
400	22.2	26.1	21.2	23.6	46.0	45.0	44.9	45.3
500	22.1	25.2	23.2	23.3	33.3	34.8	34.7	34.3
630	28.1	27.6	31.4	29.4	33.9	33.0	34.8	34.8
800	23.6	25.8	28.7	26.4	33.3	33.5	31.3	32.3
1000	21.9	23.2	21.3	21.0	34.3	34.8	32.9	33.2
1250	19.0	20.2	22.1	21.2	26.2	28.4	27.1	26.8
1600	17.5	17.0	17.0	17.0	24.7	24.4	23.9	23.3
2000	17.1	19.1	13.9	14.7	26.9	26.9	25.1	25.7
2500	14.8	13.5	13.1	12.6	25.4	24.8	26.1	25.3
3150	12.5	13.3	11.0	11.7	27.2	26.0	26.5	26.9
4000	10.6	11.0	10.9	12.8	25.9	25.3	26.0	25.8
5000	9.1	9.3	9.2	8.5	21.5	19.2	20.8	19.3
6300	13.1	11.4	10.6	11.2	21.7	17.4	20.0	17.5
8000	11.6	12.2	11.9	10.7	21.4	18.1	21.3	20.9
10000	10.1	10.0	11.7	10.6	19.4	15.1	19.3	19.1
12500	10.0	9.8	9.3	8.4	16.7	15.1	17.3	19.6
16000	9.4	9.6	11.4	9.3	19.8	18.3	19.3	19.3
20000	22.7	24.9	29.5	24.7	38.3	37.7	38.3	38.1

Frequency (Hz)	Sound Pressure Level in Auto Mode (dB)							
	Static				Dynamic			
	No 1	No 2	No 3	No 4	No 1	No 2	No 3	No 4
Leq	35.7	36.2	38.0	36.1	49.8	50.5	50.0	50.8
A-weighted dB(A)	31.1	32.2	33.7	32.2	44.8	45.1	44.6	45.3
Average sound pressure level dB(A)	32.3				45.0			

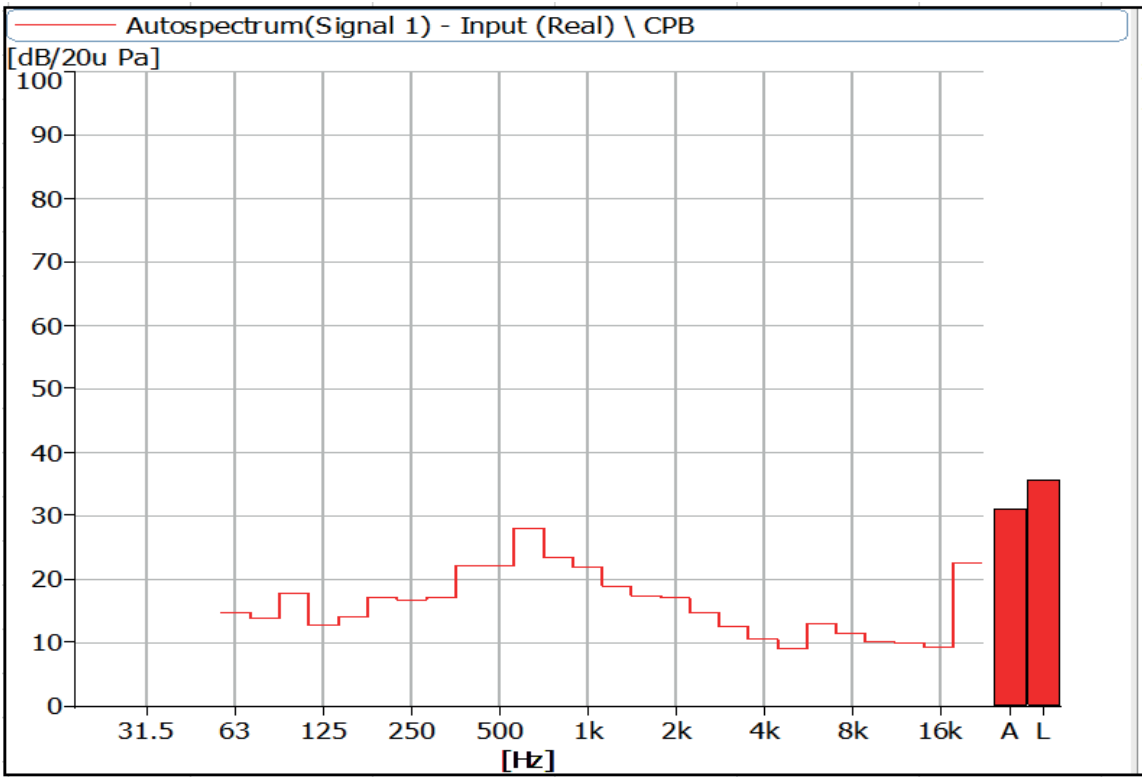

Figure 27 Noise Spectrum of Stage Luminaires (The Super Silence mode, Static, No 1)

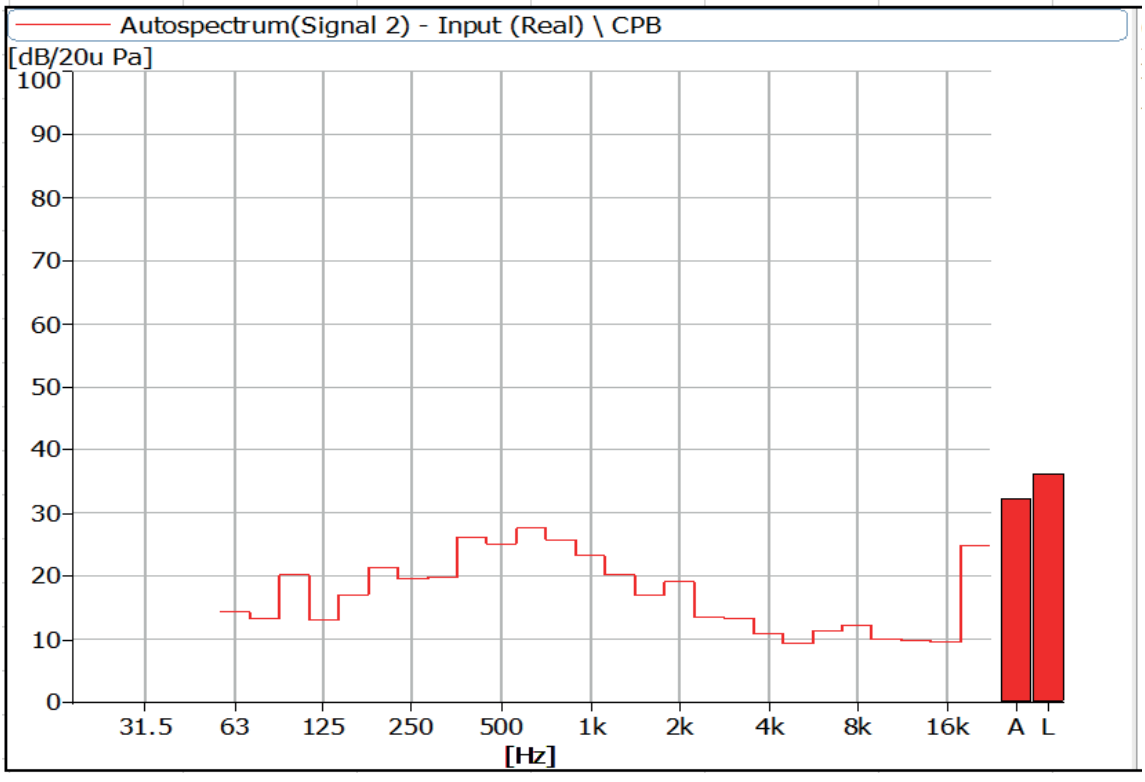

Figure 28 Noise Spectrum of Stage Luminaires (The Super Silence mode, Static, No 2)

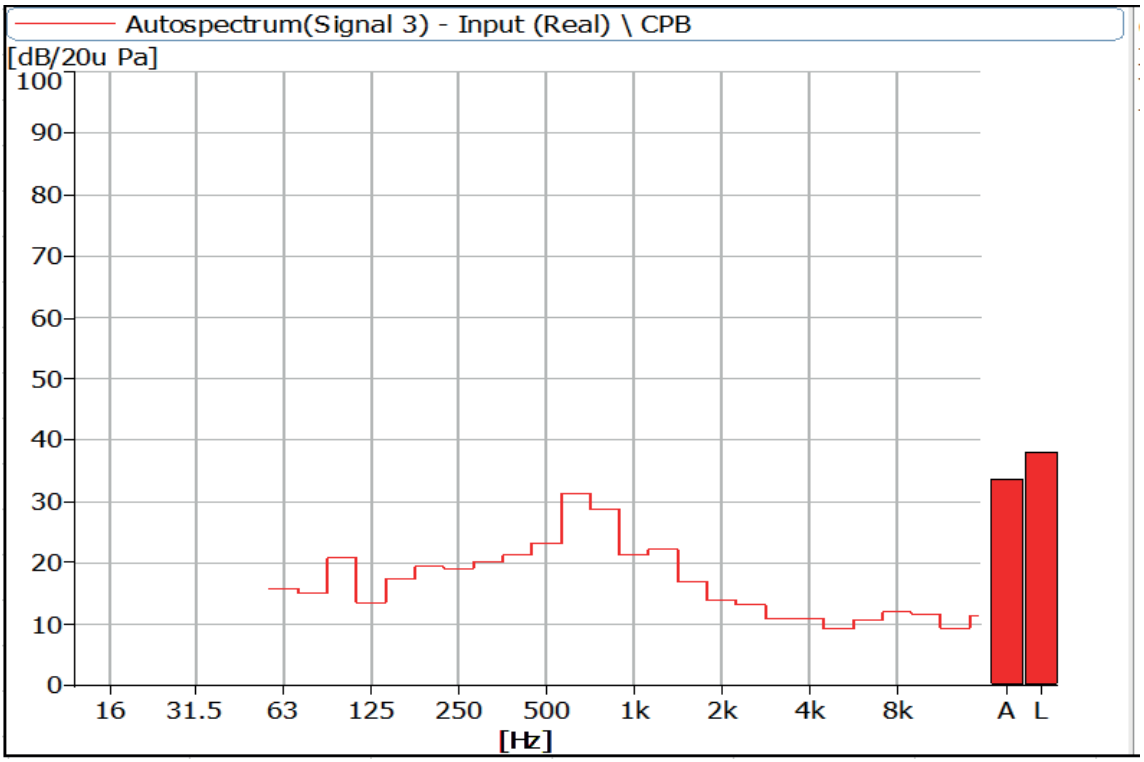

Figure 29 Noise Spectrum of Stage Luminaires (The Super Silence mode, Static, No 3)

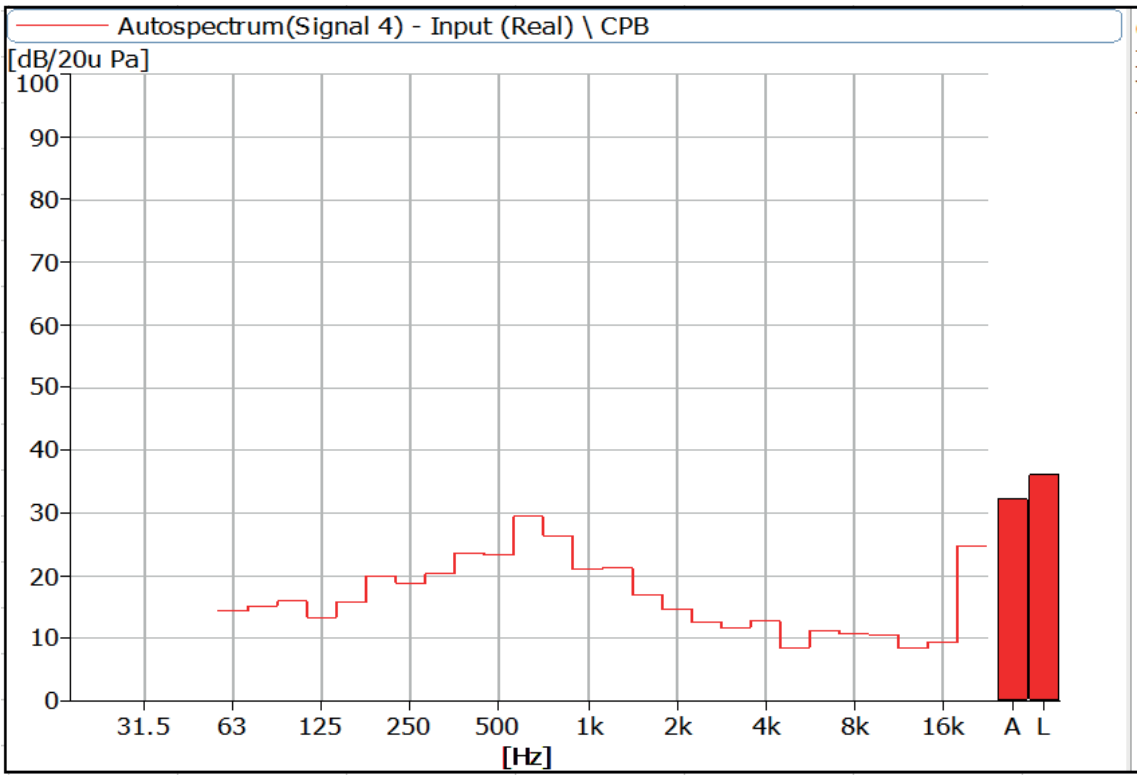

Figure 30 Noise Spectrum of Stage Luminaires (The Super Silence mode, Static, No 4)

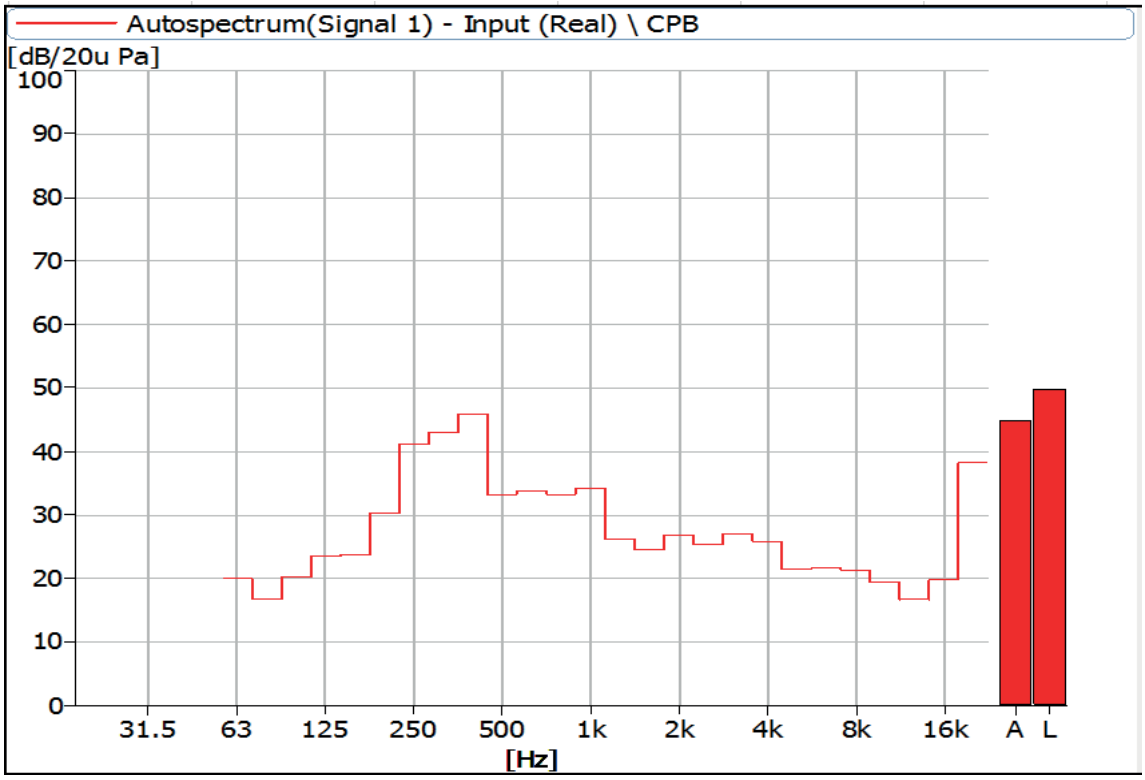

Figure 31 Noise Spectrum of Stage Luminaires (The Super Silence mode, Dynamic, No 1)

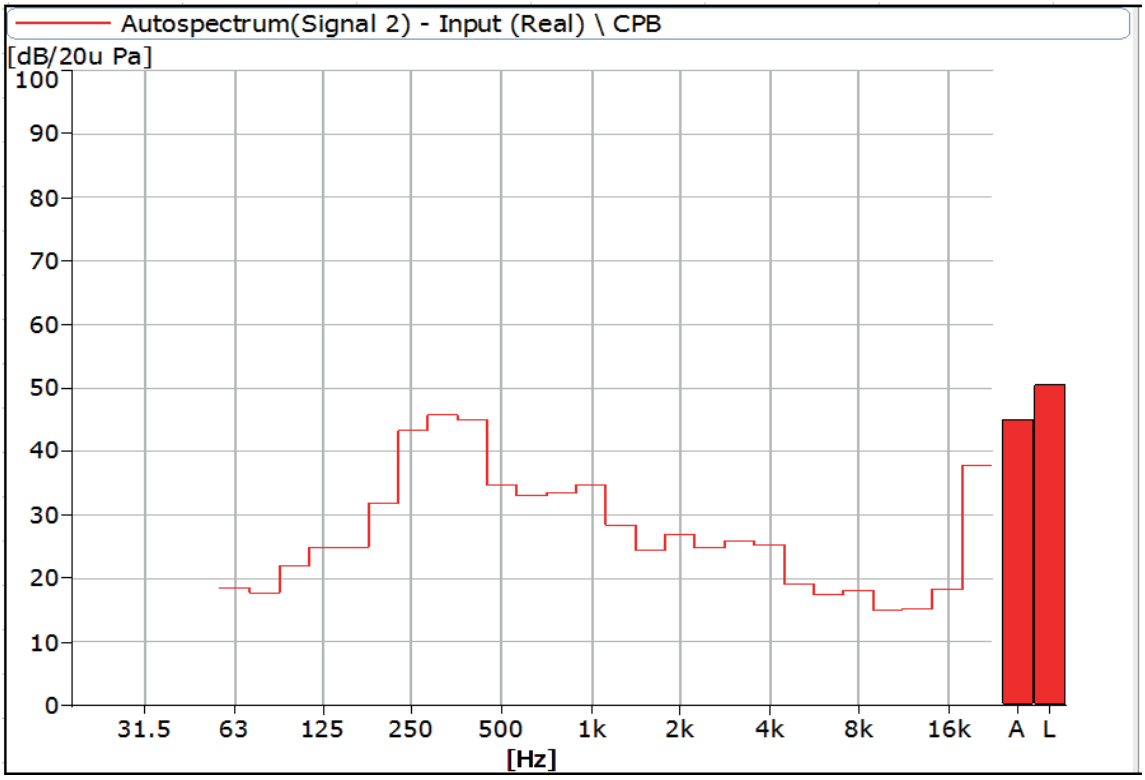

Figure 32 Noise Spectrum of Stage Luminaires (The Super Silence mode, Dynamic, No 2)

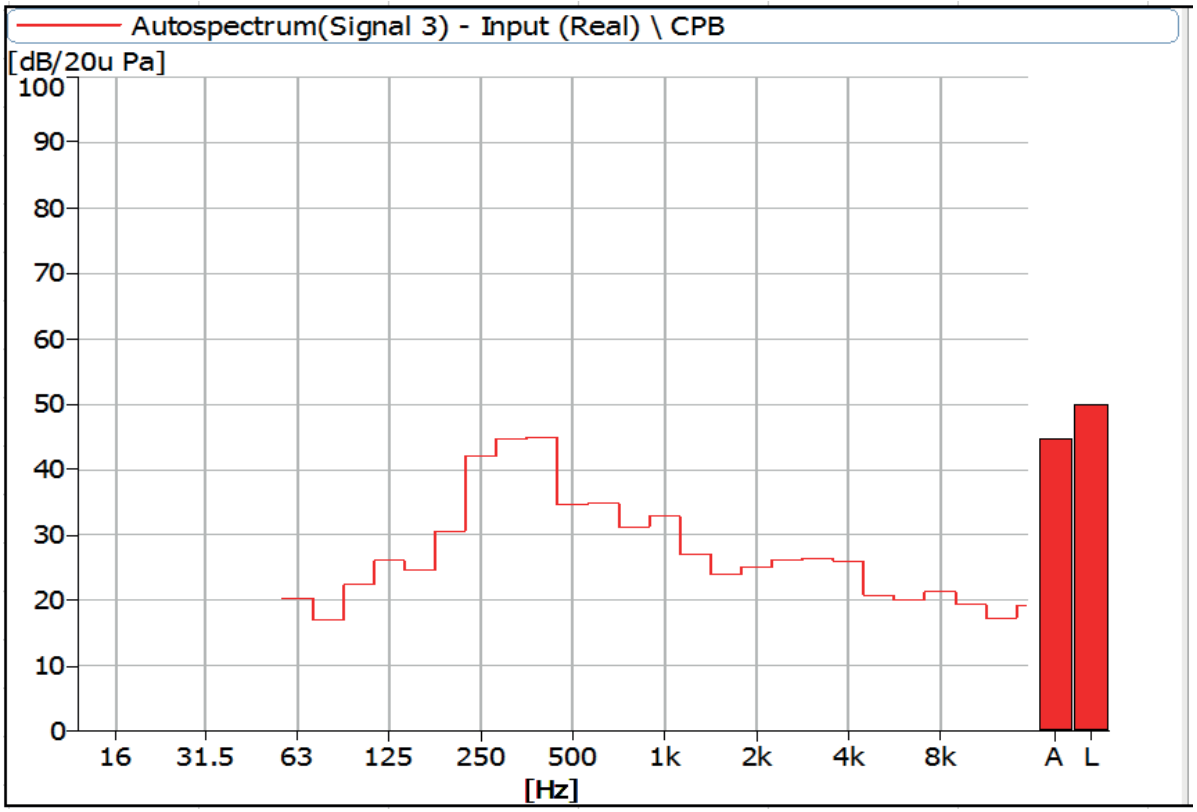

Figure 33 Noise Spectrum of Stage Luminaires (The Super Silence mode, Dynamic, No 3)

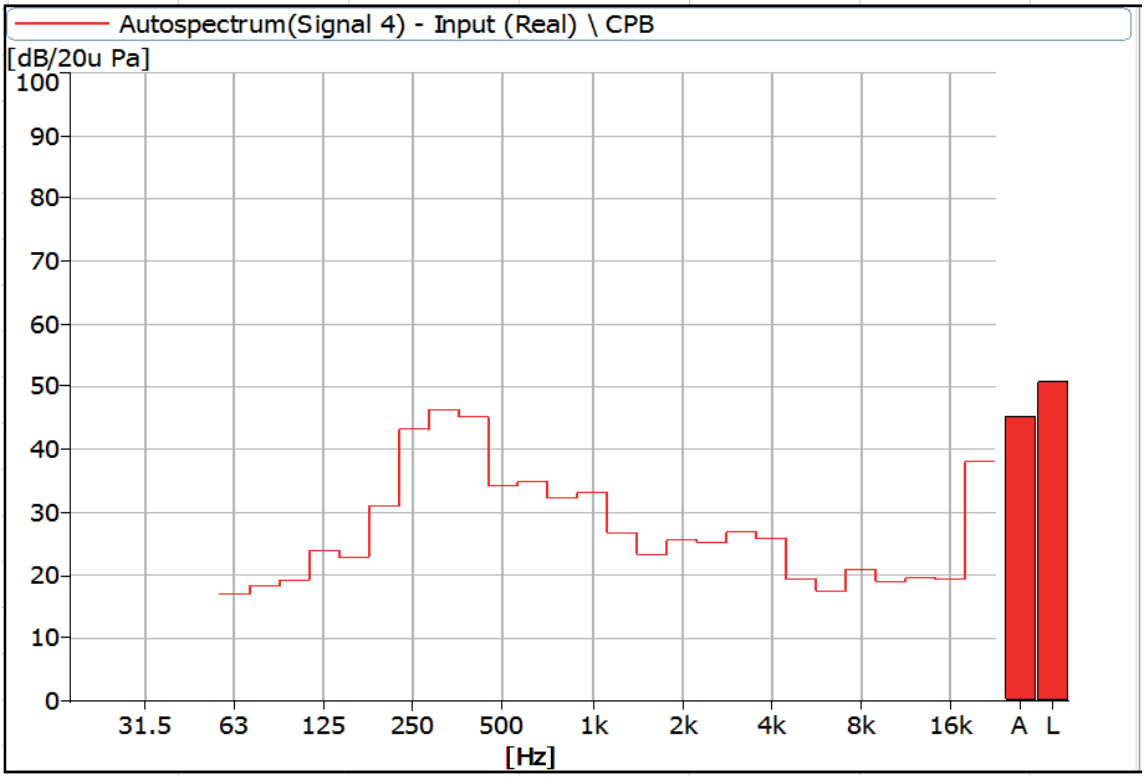

Figure 34 Noise Spectrum of Stage Luminaires (The Super Silence mode, Dynamic, No 4)

Instrumentation

No	Equipment	Type	Number	Calibration Period
1	Anechoicrooms	-	R40010	2023-05-17
2	Noise Analyzer	3160-A-042	R40011-2	2023-06-05

AYRTON

Digital Lighting