

Electronic Siren - ECN/I

Sound Propagation Characteristics

The ECN Series high power electronic sirens offered by ELPAM Electronics Ltd.
The ECN system enable providing outputs of up to 3000W.

TECHNICAL DATA

Acoustic Features - Omni-directional or directional sound propagation.
Basic frequency - 415/425 Hz

Acoustic parameter

The siren will be capable of generating a wailing volume of 123db@30m@360 outdoor.

The wailing coverage area at all frequencies in the range of 250-550 Hz will be:

- No less than 73db@1km@360° under outdoor conditions.
- No more than 135db@30m@360° under outdoor conditions.

Measured Results at 30m distance:

ECN 3000/I :Number of Horns / Drivers - 20
Sound pressure level in dB(A) - 123 dB (A) / 30m distance

ECN 2400/I :Number of Horns / Drivers - 16
Sound pressure level in dB(A) - 121 dB (A) / 30m distance

ECN 1800/I :Number of Horns / Drivers - 12
Sound pressure level in dB(A) - 118 dB (A) / 30m distance

ECN 1200/I :Number of Horns / Drivers - 8
Sound pressure level in dB(A) - 115 dB (A) / 30m distance

ECN 600/I :Number of Horns / Drivers - 4
Sound pressure level in dB(A) - 109 dB (A) / 30m distance

The ECN siren horn with a Vertical Sound Propagation is designed to propagate siren signals with high sound intensity.





ECN600/I



ECN1200/I



ECN1800/I



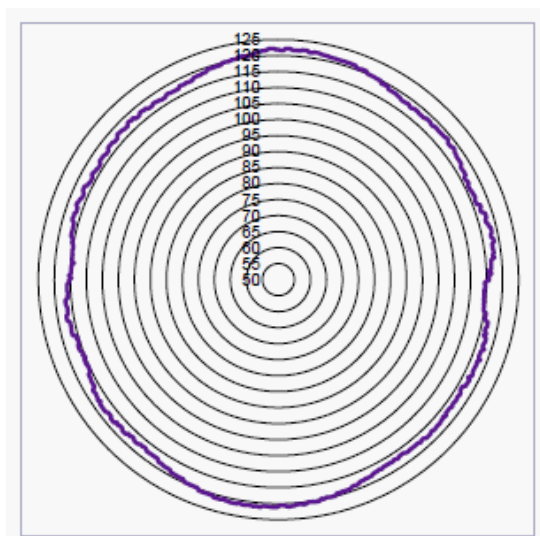
ECN2400/I



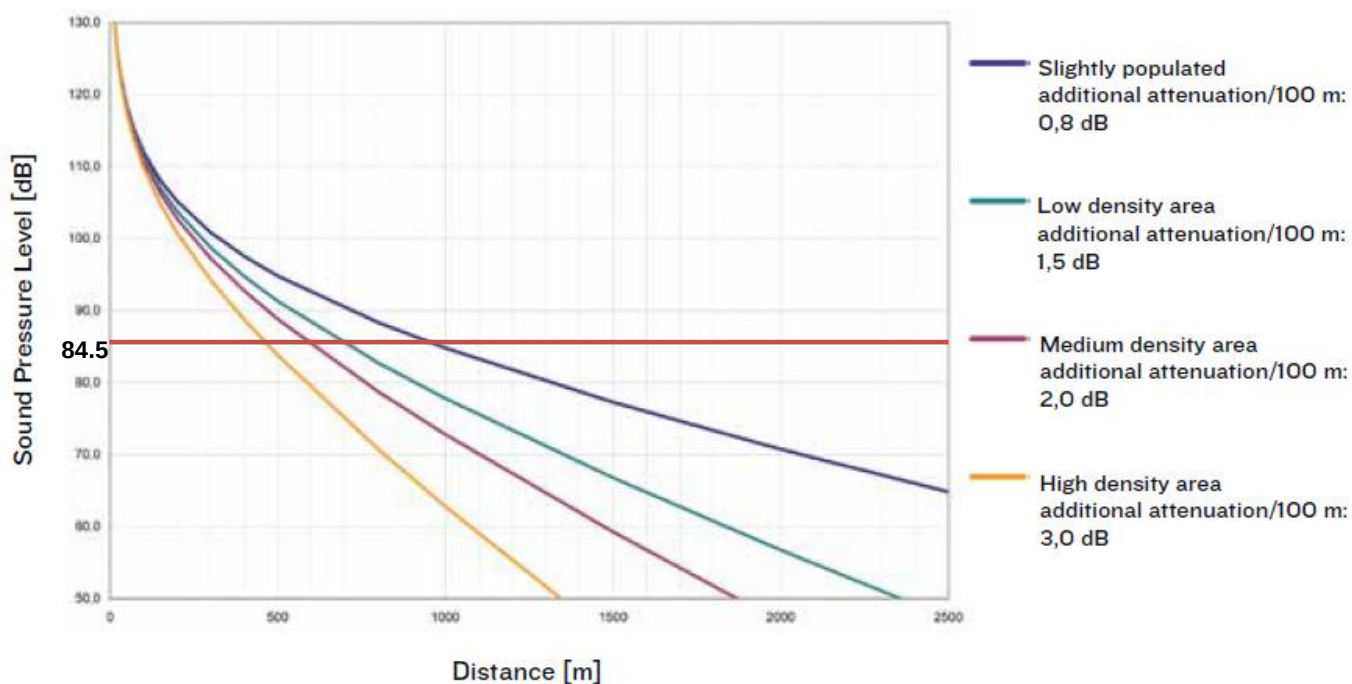
ECN3000/I

ECN3000/I

Sound Pressure Level dB(A)



Propagation of Sound Pressure Level (SPL)



Sound Pressure Level – ECN3000/I

SPL 123 dB(A) in 30m			
Slightly populated area / partially open area		0.8 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	152.5 dB	dB	0,000 qkm
4 m	140.4 dB	-12.1 dB	0,0001 qkm
8 m	134.4 dB	-18.1 dB	0,0002 qkm
16 m	128.3 dB	-24.2 dB	0,0008 qkm
30 m	123.0 dB	-29.5 dB	0,0028 qkm
40 m	120.1 dB	-32.4 dB	0,0050 qkm
50 m	118.1 dB	-34.4 dB	0,0079 qkm
100 m	111.7 dB	-40.8 dB	0,0314 qkm
500 m	94.5 dB	-58.0 dB	0,7850 qkm
1000 m	84.5 dB	-68.0 dB	3,1400 qkm
1250 m	80.6 dB	-71.9 dB	4,9063 qkm
1500 m	77.0 dB	-75.5 dB	7,0650 qkm
1750 m	73.6 dB	-78.9 dB	9,6163 qkm
2000 m	70.5 dB	-82.0 dB	12,5600 qkm
2200 m	68.1 dB	-84.4 dB	15,1976 qkm
2500 m	64.5 dB	-88.0 dB	19,6250 qkm
2600 m	63.4 dB	-89.1 dB	21,2264 qkm

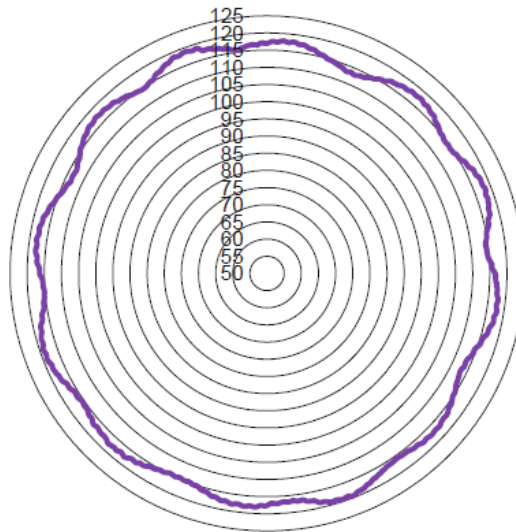
SPL 123 dB(A) in 30m			
Low density area / 1storey buildings		1.5 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	152.5 dB	dB	0,000 qkm
4 m	140.4 dB	-12.1 dB	0,0001 qkm
8 m	134.4 dB	-18.1 dB	0,0002 qkm
16 m	128.3 dB	-24.2 dB	0,0008 qkm
30 m	123.0 dB	-29.5 dB	0,0028 qkm
40 m	119.9 dB	-32.6 dB	0,0050 qkm
50 m	117.8 dB	-34.7 dB	0,0079 qkm
100 m	111.0 dB	-41.5 dB	0,0314 qkm
500 m	91.0 dB	-61.5 dB	0,7850 qkm
1000 m	77.5 dB	-75.0 dB	3,1400 qkm
1250 m	71.8 dB	-80.7 dB	4,9063 qkm
1500 m	66.5 dB	-86.0 dB	7,0650 qkm
1750 m	61.4 dB	-91.1 dB	9,6163 qkm
2000 m	56.5 dB	-96.0 dB	12,5600 qkm
2200 m	52.7 dB	-99.8 dB	15,1976 qkm
2500 m	47.0 dB	-105.5 dB	19,6250 qkm
2600 m	45.2 dB	-107.3 dB	21,2264 qkm

SPL 123 dB(A) in 30m			
Medium density area / 3storey buildings		2 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	152.5 dB	dB	0,000 qkm
4 m	140.4 dB	-12.1 dB	0,0001 qkm
8 m	134.4 dB	-18.1 dB	0,0002 qkm
16 m	128.3 dB	-24.2 dB	0,0008 qkm
30 m	123.0 dB	-29.5 dB	0,0028 qkm
40 m	119.7 dB	-32.8 dB	0,0050 qkm
50 m	117.5 dB	-35.0 dB	0,0079 qkm
100 m	110.5 dB	-42.0 dB	0,0314 qkm
500 m	88.5 dB	-64.0 dB	0,7850 qkm
1000 m	72.5 dB	-80.0 dB	3,1400 qkm
1250 m	65.6 dB	-86.9 dB	4,9063 qkm
1500 m	59.0 dB	-93.5 dB	7,0650 qkm
1750 m	52.6 dB	-99.9 dB	9,6163 qkm
2000 m	46.5 dB	-106.0 dB	12,5600 qkm
2200 m	41.7 dB	-110.8 dB	15,1976 qkm
2500 m	34.5 dB	-118.0 dB	19,6250 qkm
2600 m	32.2 dB	-120.3 dB	21,2264 qkm

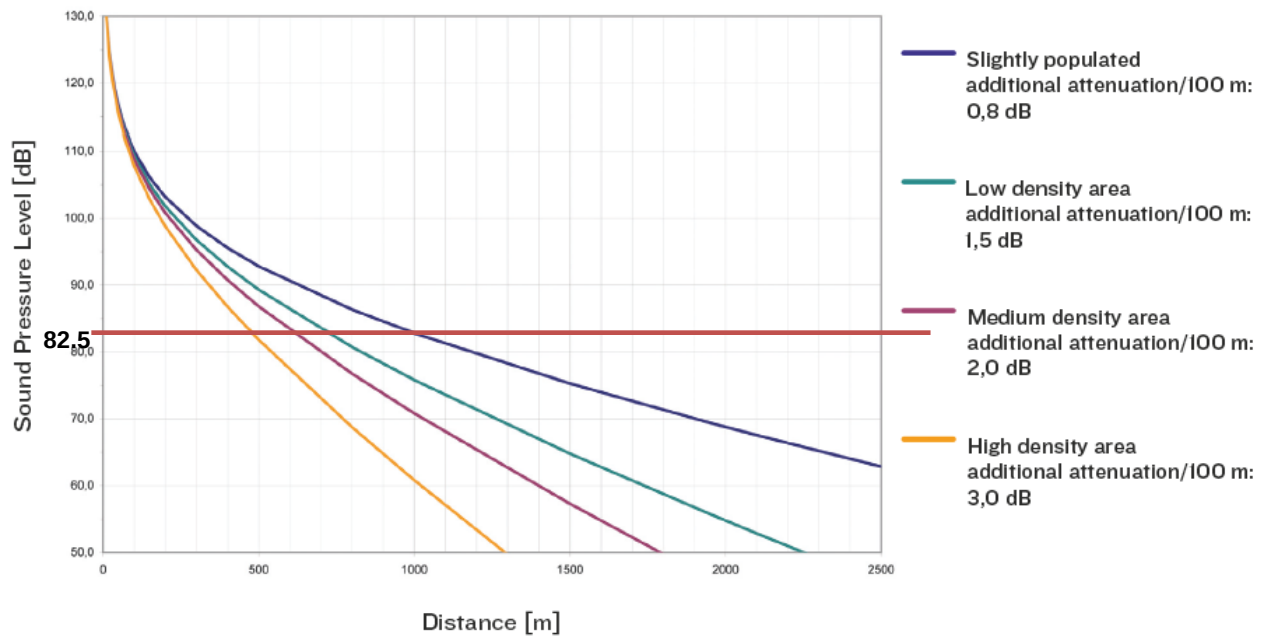
SPL 123 dB(A) in 30m			
High density City area / high rise buildings		3 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	152.5 dB	dB	0,000 qkm
4 m	140.4 dB	-12.1 dB	0,0001 qkm
8 m	134.4 dB	-18.1 dB	0,0002 qkm
16 m	128.3 dB	-24.2 dB	0,0008 qkm
30 m	123.0 dB	-29.5 dB	0,0028 qkm
40 m	119.3 dB	-33.2 dB	0,0050 qkm
50 m	117.0 dB	-35.5 dB	0,0079 qkm
100 m	109.5 dB	-43.0 dB	0,0314 qkm
500 m	83.5 dB	-69.0 dB	0,7850 qkm
1000 m	62.5 dB	-90.0 dB	3,1400 qkm
1250 m	53.1 dB	-99.4 dB	4,9063 qkm
1500 m	44.0 dB	-108.5 dB	7,0650 qkm
1750 m	35.1 dB	-117.4 dB	9,6163 qkm
2000 m	26.5 dB	-126.0 dB	12,5600 qkm
2200 m	19.7 dB	-132.8 dB	15,1976 qkm
2500 m	9.5 dB	-143.0 dB	19,6250 qkm
2600 m	6.2 dB	-146.3 dB	21,2264 qkm

ECN2400/I

Sound Pressure Level dB(A)



Propagation of Sound Pressure Level (SPL)



Sound Pressure Level – ECN2400/I

SPL 121 dB(A) in 30m			
Slightly populated area / partially open area		0.8 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	150.5 dB	dB	0,000 qkm
4 m	140.4 dB	-12.1 dB	0,0001 qkm
8 m	132.4 dB	-18.1 dB	0,0002 qkm
16 m	126.3 dB	-24.2 dB	0,0008 qkm
30 m	121.0 dB	-29.5 dB	0,0028 qkm
40 m	118.1 dB	-32.4 dB	0,0050 qkm
50 m	116.1 dB	-34.4 dB	0,0079 qkm
100 m	109.7 dB	-40.8 dB	0,0314 qkm
500 m	92.5 dB	-58.0 dB	0,7850 qkm
1000 m	82.5 dB	-68.0 dB	3,1400 qkm
1250 m	78.6 dB	-71.9 dB	4,9063 qkm
1500 m	75.0 dB	-75.5 dB	7,0650 qkm
1750 m	71.6 dB	-78.9 dB	9,6163 qkm
2000 m	68.5 dB	-82.0 dB	12,5600 qkm
2200 m	66.1 dB	-84.4 dB	15,1976 qkm
2500 m	62.5 dB	-88.0 dB	19,6250 qkm
2600 m	61.4 dB	-89.1 dB	21,2264 qkm

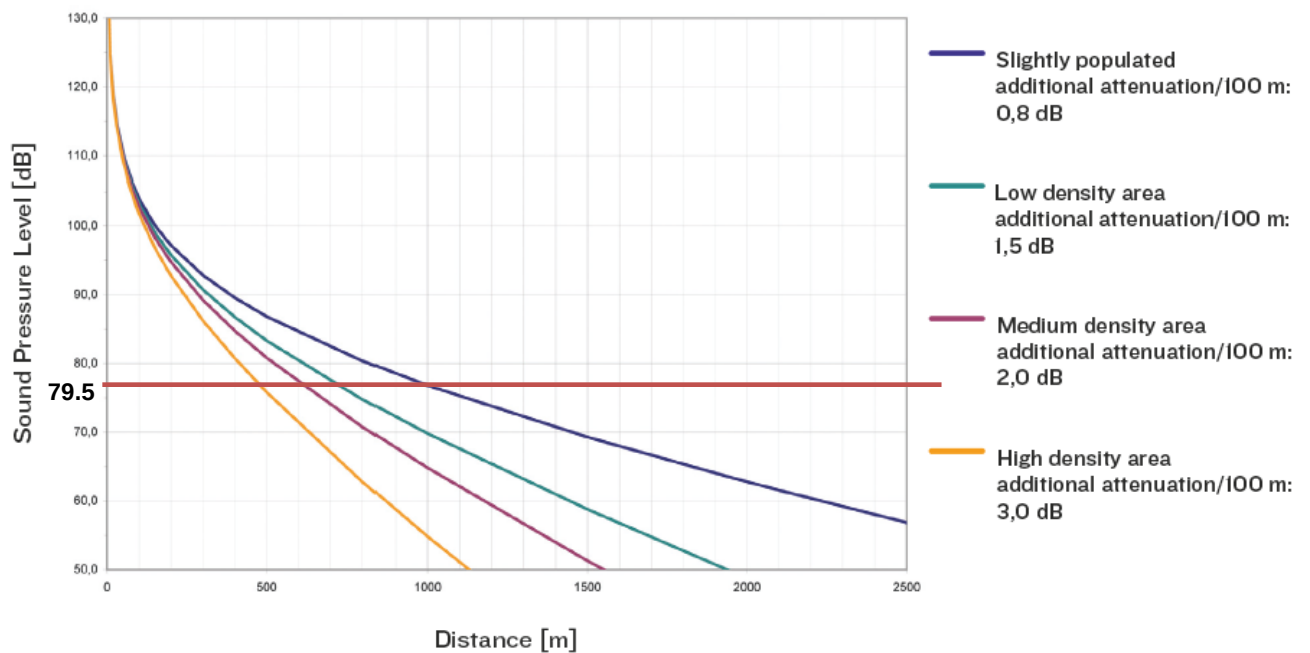
SPL 121 dB(A) in 30m			
Low density area / 1storey buildings		1.5 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	150.5 dB	dB	0,000 qkm
4 m	138.4 dB	-12.1 dB	0,0001 qkm
8 m	132.3 dB	-18.2 dB	0,0002 qkm
16 m	126.3 dB	-24.3 dB	0,0008 qkm
30 m	121.0 dB	-29.5 dB	0,0028 qkm
40 m	117.9 dB	-32.6 dB	0,0050 qkm
50 m	115.8 dB	-34.7 dB	0,0079 qkm
100 m	109.0 dB	-41.5 dB	0,0314 qkm
500 m	89.0 dB	-61.5 dB	0,7850 qkm
1000 m	75.5 dB	-75.0 dB	3,1400 qkm
1250 m	69.8 dB	-80.7 dB	4,9063 qkm
1500 m	64.5 dB	-86.0 dB	7,0650 qkm
1750 m	59.4 dB	-91.1 dB	9,6163 qkm
2000 m	54.5 dB	-96.0 dB	12,5600 qkm
2200 m	50.7 dB	-99.8 dB	15,1976 qkm
2500 m	45.0 dB	-105.5 dB	19,6250 qkm
2600 m	43.2 dB	-107.3 dB	21,2264 qkm

SPL 121 dB(A) in 30m			
Medium density area / 3storey buildings		2 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	150.5 dB	dB	0,000 qkm
4 m	138.4 dB	-12.1 dB	0,0001 qkm
8 m	132.4 dB	-18.2 dB	0,0002 qkm
16 m	126.1 dB	-24.2 dB	0,0008 qkm
30 m	121.0 dB	-29.5 dB	0,0028 qkm
40 m	117.7 dB	-32.8 dB	0,0050 qkm
50 m	115.5 dB	-35.0 dB	0,0079 qkm
100 m	108.5 dB	-42.0 dB	0,0314 qkm
500 m	86.5 dB	-64.0 dB	0,7850 qkm
1000 m	70.5 dB	-80.0 dB	3,1400 qkm
1250 m	63.6 dB	-86.9 dB	4,9063 qkm
1500 m	57.0 dB	-93.5 dB	7,0650 qkm
1750 m	50.6 dB	-99.9 dB	9,6163 qkm
2000 m	44.5 dB	-106.0 dB	12,5600 qkm
2200 m	39.7 dB	-110.8 dB	15,1976 qkm
2500 m	32.5 dB	-118.0 dB	19,6250 qkm
2600 m	30.2 dB	-120.3 dB	21,2264 qkm

SPL 121 dB(A) in 30m			
High density City area / high rise buildings		3 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	150.5 dB	dB	0,000 qkm
4 m	138.4 dB	-12.2 dB	0,0001 qkm
8 m	132.4 dB	-18.3 dB	0,0002 qkm
16 m	125.9 dB	-24.6 dB	0,0008 qkm
30 m	121.0 dB	-29.5 dB	0,0028 qkm
40 m	117.3 dB	-33.2 dB	0,0050 qkm
50 m	115.0 dB	-35.5dB	0,0079 qkm
100 m	107.5 dB	-43.0 dB	0,0314 qkm
500 m	81.5 dB	-69.0 dB	0,7850 qkm
1000 m	60.5 dB	-90.0 dB	3,1400 qkm
1250 m	51.1 dB	-99.4 dB	4,9063 qkm
1500 m	42.0 dB	-108.5 dB	7,0650 qkm
1750 m	33.1 dB	-117.4 dB	9,6163 qkm
2000 m	24.5 dB	-126.0 dB	12,5600 qkm
2200 m	17.7 dB	-132.8 dB	15,1976 qkm
2500 m	7.5 dB	-143.0 dB	19,6250 qkm
2600 m	4.2 dB	-146.3 dB	21,2264 qkm

Sound Pressure Level dB(A)

Propagation of Sound Pressure Level (SPL)



Sound Pressure Level – ECN1800/I

SPL 118 dB(A) in 30m			
Slightly populated area / partially open area		0.8 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	147.5 dB	dB	0,000 qkm
4 m	135.4 dB	-12.1 dB	0,0001 qkm
8 m	129.4 dB	-18.1 dB	0,0002 qkm
16 m	123.3 dB	-24.2 dB	0,0008 qkm
30 m	118.0 dB	-29.5 dB	0,0028 qkm
40 m	115.1 dB	-32.4 dB	0,0050 qkm
50 m	113.1 dB	-34.4 dB	0,0079 qkm
100 m	106.7 dB	-40.8 dB	0,0314 qkm
500 m	89.5 dB	-58.0 dB	0,7850 qkm
1000 m	79.5 dB	-68.0 dB	3,1400 qkm
1250 m	75.6 dB	-71.9 dB	4,9063 qkm
1500 m	72.0 dB	-75.5 dB	7,0650 qkm
1750 m	68.6 dB	-78.9 dB	9,6163 qkm
2000 m	65.5 dB	-82.0 dB	12,5600 qkm
2200 m	63.1 dB	-84.4 dB	15,1976 qkm
2500 m	59.5 dB	-88.0 dB	19,6250 qkm
2600 m	58.4 dB	-89.1 dB	21,2264 qkm

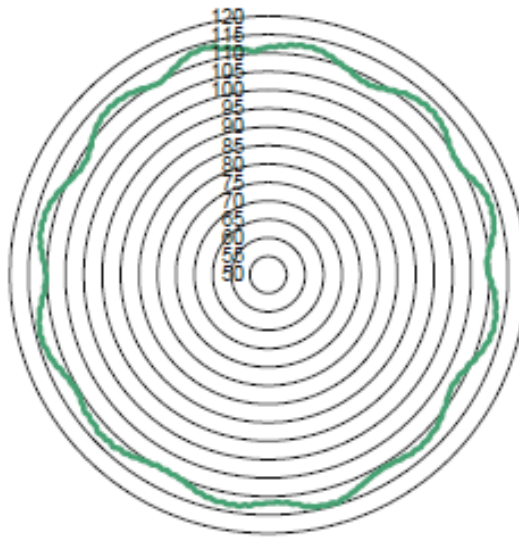
SPL 118 dB(A) in 30m			
Low density area / 1storey buildings		1.5 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	147.5 dB	dB	0,000 qkm
4 m	135.4 dB	-12.1 dB	0,0001 qkm
8 m	129.3 dB	-18.2 dB	0,0002 qkm
16 m	123.3 dB	-24.3 dB	0,0008 qkm
30 m	118.0 dB	-29.5 dB	0,0028 qkm
40 m	114.9 dB	-32.6 dB	0,0050 qkm
50 m	112.8 dB	-34.7 dB	0,0079 qkm
100 m	106.0 dB	-41.5 dB	0,0314 qkm
500 m	86.0 dB	-61.5 dB	0,7850 qkm
1000 m	72.5 dB	-75.0 dB	3,1400 qkm
1250 m	66.8 dB	-80.7 dB	4,9063 qkm
1500 m	61.5 dB	-86.0 dB	7,0650 qkm
1750 m	56.4 dB	-91.1 dB	9,6163 qkm
2000 m	51.5 dB	-96.0 dB	12,5600 qkm
2200 m	47.7 dB	-99.8 dB	15,1976 qkm
2500 m	42.0 dB	-105.5 dB	19,6250 qkm
2600 m	40.2 dB	-107.3 dB	21,2264 qkm

SPL 118 dB(A) in 30m			
Medium density area / 3storey buildings		2 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	147.5 dB	dB	0,000 qkm
4 m	135.4 dB	-12.1 dB	0,0001 qkm
8 m	129.3 dB	-18.2 dB	0,0002 qkm
16 m	123.1 dB	-24.4 dB	0,0008 qkm
30 m	118.0 dB	-29.5 dB	0,0028 qkm
40 m	114.7 dB	-32.8 dB	0,0050 qkm
50 m	112.5 dB	-35.0 dB	0,0079 qkm
100 m	105.5 dB	-42.0 dB	0,0314 qkm
500 m	83.5 dB	-64.0 dB	0,7850 qkm
1000 m	67.5 dB	-80.0 dB	3,1400 qkm
1250 m	60.6 dB	-86.9 dB	4,9063 qkm
1500 m	54.0 dB	-93.5 dB	7,0650 qkm
1750 m	47.6 dB	-99.9 dB	9,6163 qkm
2000 m	41.5 dB	-106.0 dB	12,5600 qkm
2200 m	36.7 dB	-110.8 dB	15,1976 qkm
2500 m	29.5 dB	-118.0 dB	19,6250 qkm
2600 m	27.2 dB	-120.3 dB	21,2264 qkm

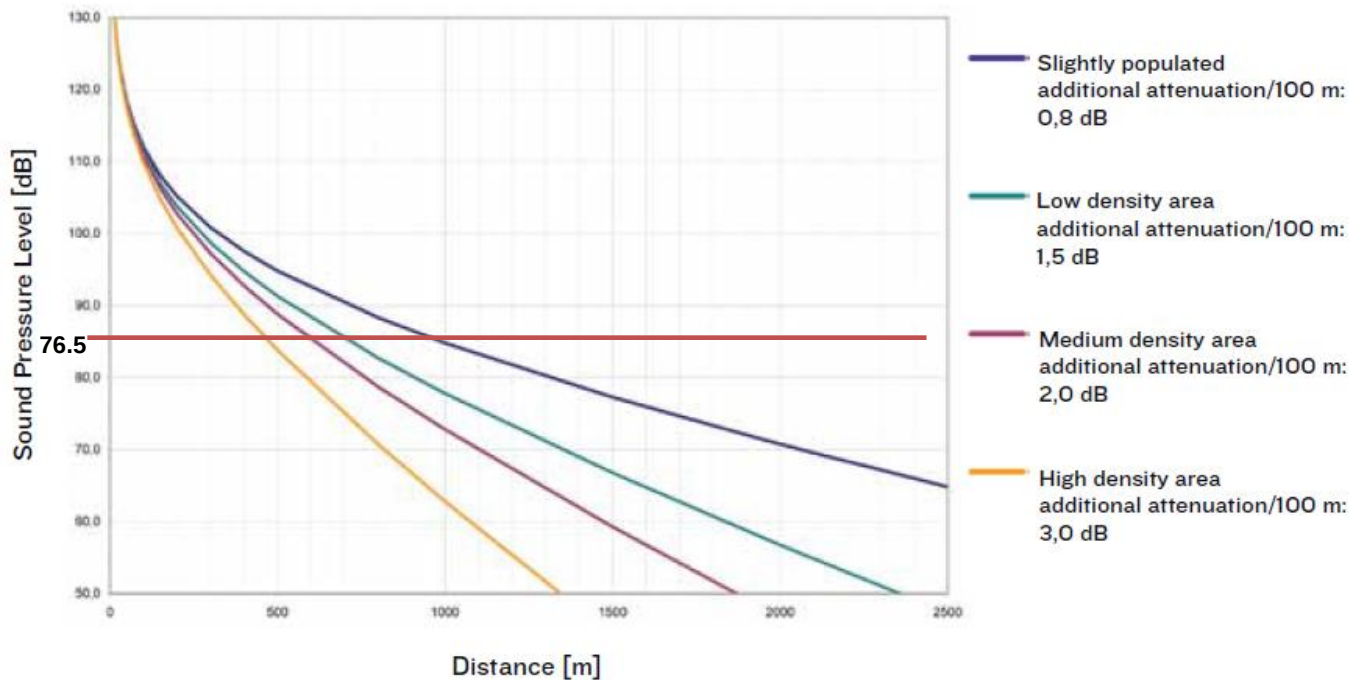
SPL 118 dB(A) in 30m			
High density City area / high rise buildings		3 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	147.5 dB	dB	0,000 qkm
4 m	135.3 dB	-12.2 dB	0,0001 qkm
8 m	129.2 dB	-18.3 dB	0,0002 qkm
16 m	122.9 dB	-24.6 dB	0,0008 qkm
30 m	118.0 dB	-29.5 dB	0,0028 qkm
40 m	114.3 dB	-33.2 dB	0,0050 qkm
50 m	112.0 dB	-35.5dB	0,0079 qkm
100 m	104.5 dB	-43.0 dB	0,0314 qkm
500 m	78.5 dB	-69.0 dB	0,7850 qkm
1000 m	57.5 dB	-90.0 dB	3,1400 qkm
1250 m	48.1 dB	-99.4 dB	4,9063 qkm
1500 m	39.0 dB	-108.5 dB	7,0650 qkm
1750 m	30.1 dB	-117.4 dB	9,6163 qkm
2000 m	21.5 dB	-126.0 dB	12,5600 qkm
2200 m	14.7 dB	-132.8 dB	15,1976 qkm
2500 m	4.5 dB	-143.0 dB	19,6250 qkm
2600 m	1.2 dB	-146.3 dB	21,2264 qkm

ECN1200/I

Sound Pressure Level dB(A)



Propagation of Sound Pressure Level (SPL)



Sound Pressure Level – ECN1200/I

SPL 115 dB(A) in 30m			
Slightly populated area / partially open area		0.8 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	144.5 dB	dB	0,000 qkm
4 m	132.4 dB	-12.1 dB	0,0001 qkm
8 m	126.4 dB	-18.1 dB	0,0002 qkm
16 m	120.3 dB	-24.2 dB	0,0008 qkm
30 m	115.0 dB	-29.5 dB	0,0028 qkm
40 m	112.1 dB	-32.4 dB	0,0050 qkm
50 m	110.1 dB	-34.4 dB	0,0079 qkm
100 m	103.7 dB	-40.8 dB	0,0314 qkm
500 m	86.5 dB	-58.0 dB	0,7850 qkm
1000 m	76.5 dB	-68.0 dB	3,1400 qkm
1250 m	72.6 dB	-71.9 dB	4,9063 qkm
1500 m	69.0 dB	-75.5 dB	7,0650 qkm
1750 m	65.6 dB	-78.9 dB	9,6163 qkm
2000 m	62.5 dB	-82.0 dB	12,5600 qkm
2200 m	60.1 dB	-84.4 dB	15,1976 qkm
2500 m	56.5 dB	-88.0 dB	19,6250 qkm
2600 m	55.4 dB	-89.1 dB	21,2264 qkm

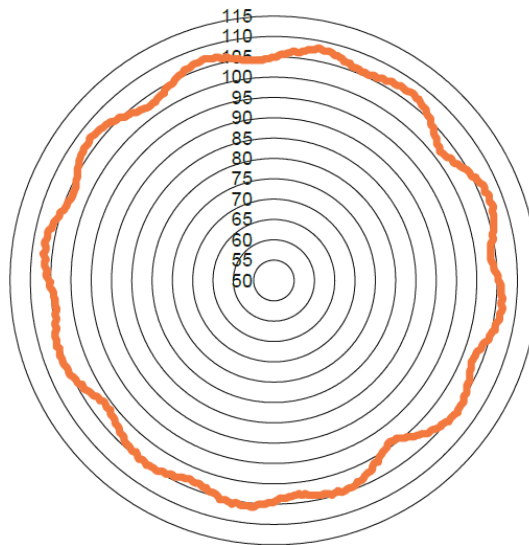
SPL 115 dB(A) in 30m			
Low density area / 1storey buildings		1.5 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	144.5 dB	dB	0,000 qkm
4 m	132.4 dB	-12.1 dB	0,0001 qkm
8 m	126.4 dB	-18.2 dB	0,0002 qkm
16 m	120.2 dB	-24.3 dB	0,0008 qkm
30 m	115.0 dB	-29.5 dB	0,0028 qkm
40 m	111.9 dB	-32.6 dB	0,0050 qkm
50 m	109.8 dB	-34.7 dB	0,0079 qkm
100 m	103.0 dB	-41.5 dB	0,0314 qkm
500 m	83.0 dB	-61.5 dB	0,7850 qkm
1000 m	69.5 dB	-75.0 dB	3,1400 qkm
1250 m	63.8 dB	-80.7 dB	4,9063 qkm
1500 m	58.5 dB	-86.0 dB	7,0650 qkm
1750 m	53.4 dB	-91.1 dB	9,6163 qkm
2000 m	48.5 dB	-96.0 dB	12,5600 qkm
2200 m	44.7 dB	-99.8 dB	15,1976 qkm
2500 m	39.0 dB	-105.5 dB	19,6250 qkm
2600 m	37.2 dB	-107.3 dB	21,2264 qkm

SPL 115 dB(A) in 30m			
Medium density area / 3storey buildings		2 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	144.5 dB	dB	0,000 qkm
4 m	132.4 dB	-12.1 dB	0,0001 qkm
8 m	126.4 dB	-18.2 dB	0,0002 qkm
16 m	120.1 dB	-24.4 dB	0,0008 qkm
30 m	115.0 dB	-29.5 dB	0,0028 qkm
40 m	111.7 dB	-32.8 dB	0,0050 qkm
50 m	109.5 dB	-35.0 dB	0,0079 qkm
100 m	102.5 dB	-42.0 dB	0,0314 qkm
500 m	80.5 dB	-64.0 dB	0,7850 qkm
1000 m	64.5 dB	-80.0 dB	3,1400 qkm
1250 m	57.6 dB	-86.9 dB	4,9063 qkm
1500 m	51.0 dB	-93.5 dB	7,0650 qkm
1750 m	44.6 dB	-99.9 dB	9,6163 qkm
2000 m	38.5 dB	-106.0 dB	12,5600 qkm
2200 m	33.7 dB	-110.8 dB	15,1976 qkm
2500 m	26.5 dB	-118.0 dB	19,6250 qkm
2600 m	24.2 dB	-120.3 dB	21,2264 qkm

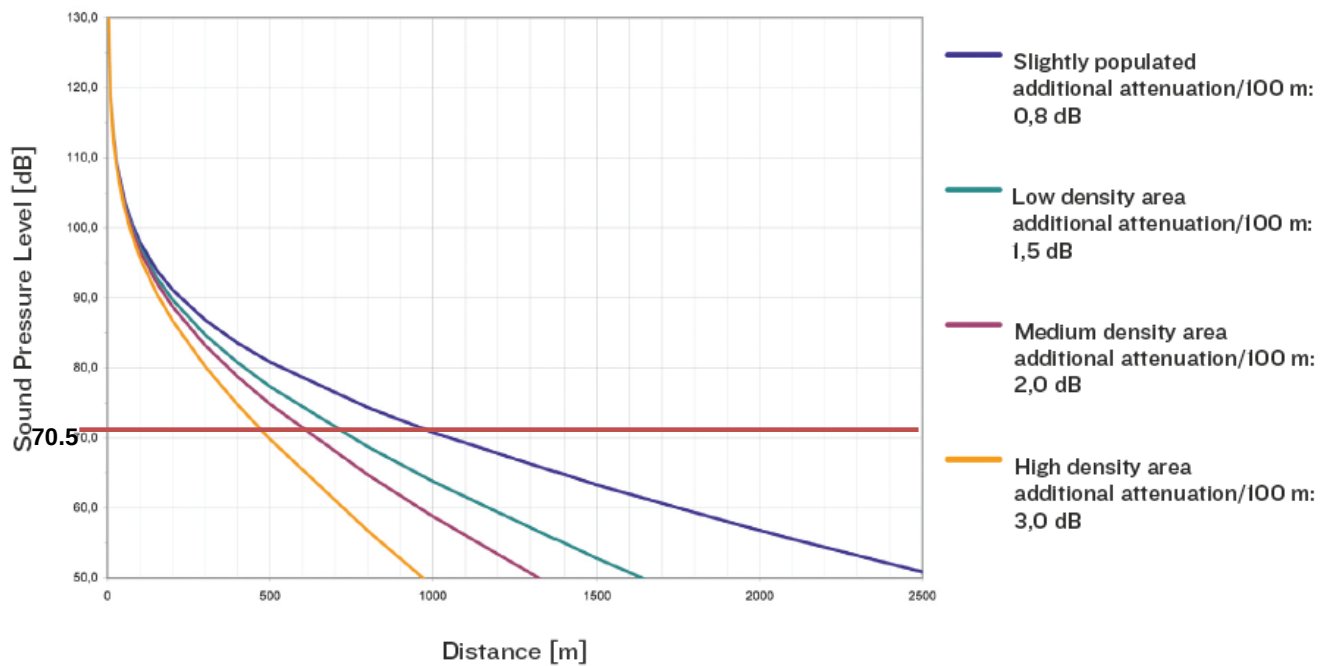
SPL 115 dB(A) in 30m			
High density City area / high rise buildings		3 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	144.5 dB	dB	0,000 qkm
4 m	132.3 dB	-12.2 dB	0,0001 qkm
8 m	126.2 dB	-18.3 dB	0,0002 qkm
16 m	119.9 dB	-24.6 dB	0,0008 qkm
30 m	115.0 dB	-29.5 dB	0,0028 qkm
40 m	111.3 dB	-33.2 dB	0,0050 qkm
50 m	109.0 dB	-35.5 dB	0,0079 qkm
100 m	101.5 dB	-43.0 dB	0,0314 qkm
500 m	75.5 dB	-69.0 dB	0,7850 qkm
1000 m	54.5 dB	-90.0 dB	3,1400 qkm
1250 m	41.1 dB	-99.4 dB	4,9063 qkm
1500 m	36.0 dB	-108.5 dB	7,0650 qkm
1750 m	27.1 dB	-117.4 dB	9,6163 qkm
2000 m	18.5 dB	-126.0 dB	12,5600 qkm
2200 m	11.7 dB	-132.8 dB	15,1976 qkm
2500 m	1.5 dB	-143.0 dB	19,6250 qkm
2600 m	-1.8 dB	-146.3 dB	21,2264 qkm

ECN600/I

Sound Pressure Level dB(A)



Propagation of Sound Pressure Level (SPL)



Sound Pressure Level – ECN600/I

SPL 109 dB(A) in 30m			
Slightly populated area / partially open area		0.8 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	138.5 dB	dB	0,000 qkm
4 m	126.4 dB	-12.1 dB	0,0001 qkm
8 m	120.4 dB	-18.1 dB	0,0002 qkm
16 m	114.3 dB	-24.2 dB	0,0008 qkm
30 m	109.0 dB	-29.5 dB	0,0028 qkm
40 m	106.1 dB	-32.4 dB	0,0050 qkm
50 m	104.1 dB	-34.4 dB	0,0079 qkm
100 m	97.7 dB	-40.8 dB	0,0314 qkm
500 m	80.5 dB	-58.0 dB	0,7850 qkm
1000 m	70.5 dB	-68.0 dB	3,1400 qkm
1250 m	66.6 dB	-71.9 dB	4,9063 qkm
1500 m	63.0 dB	-75.5 dB	7,0650 qkm
1750 m	59.6 dB	-78.9 dB	9,6163 qkm
2000 m	56.5 dB	-82.0 dB	12,5600 qkm
2200 m	54.1 dB	-84.4 dB	15,1976 qkm
2500 m	50.5 dB	-88.0 dB	19,6250 qkm
2600 m	49.4 dB	-89.1 dB	21,2264 qkm

SPL 109 dB(A) in 30m			
Low density area / 1storey buildings		1.5 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	138.5 dB	dB	0,000 qkm
4 m	126.4 dB	-12.1 dB	0,0001 qkm
8 m	120.4 dB	-18.2 dB	0,0002 qkm
16 m	114.2 dB	-24.3 dB	0,0008 qkm
30 m	109.0 dB	-29.5 dB	0,0028 qkm
40 m	105.9 dB	-32.6 dB	0,0050 qkm
50 m	103.8 dB	-34.7 dB	0,0079 qkm
100 m	97.0 dB	-41.5 dB	0,0314 qkm
500 m	77.0 dB	-61.5 dB	0,7850 qkm
1000 m	63.5 dB	-75.0 dB	3,1400 qkm
1250 m	57.8 dB	-80.7 dB	4,9063 qkm
1500 m	52.5 dB	-86.0 dB	7,0650 qkm
1750 m	47.4 dB	-91.1 dB	9,6163 qkm
2000 m	42.5 dB	-96.0 dB	12,5600 qkm
2200 m	38.7 dB	-99.8 dB	15,1976 qkm
2500 m	33.0 dB	-105.5 dB	19,6250 qkm
2600 m	31.2 dB	-107.3 dB	21,2264 qkm

SPL 109 dB(A) in 30m			
Medium density area / 3storey buildings		2 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	138.5 dB	dB	0,000 qkm
4 m	126.4 dB	-12.1 dB	0,0001 qkm
8 m	120.3 dB	-18.2 dB	0,0002 qkm
16 m	114.3 dB	-24.4 dB	0,0008 qkm
30 m	109.0 dB	-29.5 dB	0,0028 qkm
40 m	105.7 dB	-32.8 dB	0,0050 qkm
50 m	103.5 dB	-35.0 dB	0,0079 qkm
100 m	96.5 dB	-42.0 dB	0,0314 qkm
500 m	74.5 dB	-64.0 dB	0,7850 qkm
1000 m	58.5 dB	-80.0 dB	3,1400 qkm
1250 m	51.6 dB	-86.9 dB	4,9063 qkm
1500 m	45.0 dB	-93.5 dB	7,0650 qkm
1750 m	38.6 dB	-99.9 dB	9,6163 qkm
2000 m	32.5 dB	-106.0 dB	12,5600 qkm
2200 m	27.7 dB	-110.8 dB	15,1976 qkm
2500 m	20.5 dB	-118.0 dB	19,6250 qkm
2600 m	18.2 dB	-120.3 dB	21,2264 qkm

SPL 109 dB(A) in 30m			
High density City area / high rise buildings		3 db attenuation per 100m	
Distance	SPL	Attenuation	Area (r²x3.14)
1 m	138.5 dB	dB	0,000 qkm
4 m	126.3 dB	-12.2 dB	0,0001 qkm
8 m	120.4 dB	-18.3 dB	0,0002 qkm
16 m	113.9 dB	-24.6 dB	0,0008 qkm
30 m	109.0 dB	-29.5 dB	0,0028 qkm
40 m	105.3 dB	-33.2 dB	0,0050 qkm
50 m	103.0 dB	-35.5dB	0,0079 qkm
100 m	95.5 dB	-43.0 dB	0,0314 qkm
500 m	69.5 dB	-69.0 dB	0,7850 qkm
1000 m	48.5 dB	-90.0 dB	3,1400 qkm
1250 m	39.1 dB	-99.4 dB	4,9063 qkm
1500 m	30.0 dB	-108.5 dB	7,0650 qkm
1750 m	21.1 dB	-117.4 dB	9,6163 qkm
2000 m	12.5 dB	-126.0 dB	12,5600 qkm
2200 m	5.7 dB	-132.8 dB	15,1976 qkm
2500 m	-4.5 dB	-143.0 dB	19,6250 qkm
2600 m	-7.8 dB	-146.3 dB	21,2264 qkm

Frequently asked questions

In this section you will find questions and answers all about warnings and alarms with sirens.

What sound propagation options do the electronic sirens offer?

Omni-directional (360°) sound propagation for standard assembly of the horns
Directed mounting of the horns means the sound will carry in this direction.

What is the acoustic output of the electronic siren?

The ECN sirens are available in various output classes. They have a characteristic sound output of 109 dB(A), 115 dB(A), 118 dB(A), 121 dB(A), 123 dB(A) in 30 meters distance. When the sound output is higher, this usually means that greater ranges can be achieved taking the surrounding conditions and environmental influences into account.

What audible ranges can be achieved with a siren?

The audible range of a siren depends on many influencing factors and cannot be calculated generally. A siren with a higher sound output always achieves a greater range than a type with less output power.

Decisive for the range is the height and type of the assembly site and the geography of the surroundings.

How is omni-directional sound propagation possible with an electronic siren?

The ideal arrangement of the siren horns is when they stand at 180° to each other. The diffraction at the gap of the siren horns ensures omni-directional 360° sound propagation. This physical mechanism ensures that the sound also enters the acoustic shadow. From a physical point of view, the diffraction of the sound waves can be explained using the Van Huygen principle.

The horns of the ECN sirens were developed in consideration of physical laws and were subjected to extensive testing so that an optimum sound propagation is guaranteed.

What power supply is required for an electronic siren?

Our electronic sirens are supplied as standard with a power supply of 230V/50Hz.

How much electricity does an electronic siren consume?

When triggering a siren alarm, the required power needed to operate the amplifier is supplied by the batteries. The batteries are charged via the mains supply 230V. The output consumption of an ECN siren is approx. 10 watt in standby mode, whilst the re-charging process of the batteries requires 150 Watt from the mains supply.

What is the sound pressure level?

The sound pressure level (SPL) is a logarithmic figure stated in decibels [dB] to describe the intensity of the sound. As the SPL is a technical figure, correlations to the perceived volume is only possible in part. To quantify the perceived volume, assessed sound pressure levels (A,B and C) are used. The A-assessment - dB(A), which is the most similar to the frequency response of the human ear, is therefore generally used for stating the SPL.

When the sound pressure level is raised by 10 dB, this is subjectively perceived as a doubling of the volume.

Shown below are formulae to be used for the purpose of sound pressure level (SPL) estimation at a distance 'd' from the sound source in compliance with recommendations issued by FEMA (Federal Emergency Management Agency, USA):

$SPL(d < 800 \text{ m}) = SPL(30) - 20 * \log(d/30)$ where the distance is less than 800 m, and

$SPL(d > 800 \text{ m}) = SPL(30) - 33,3 * \log(d/30) - 33,3 * \log(d/30)$ where the distance exceeds 800 m

where SPL(30) means sound intensity in dB, measured at a distance of 30 m from the siren; this parameter is specified by siren manufacturers. Average city noise level of 70 dB should be assumed for the purpose of estimating the siren's reach.

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How effective are voice announcements with electronic sirens?

One of the decisive advantages of the electronic sirens is the option that allows voice announcements to be made. As voice messages, stored or live, have a wider frequency range than siren signals, these can only be transmitted at a low volume. The audible range of a voice message is therefore usually lower than a siren signal.