

## 28 to 60 kHz-A (Broadband)

Transformed to 100 ohms minimum (B2)  
Ceramics wired in parallel

**Power Rating:**

- 3 kW @ 1% duty cycle
- CW<sup>(4)</sup>: 60W in R509  
40W in CM599, R599

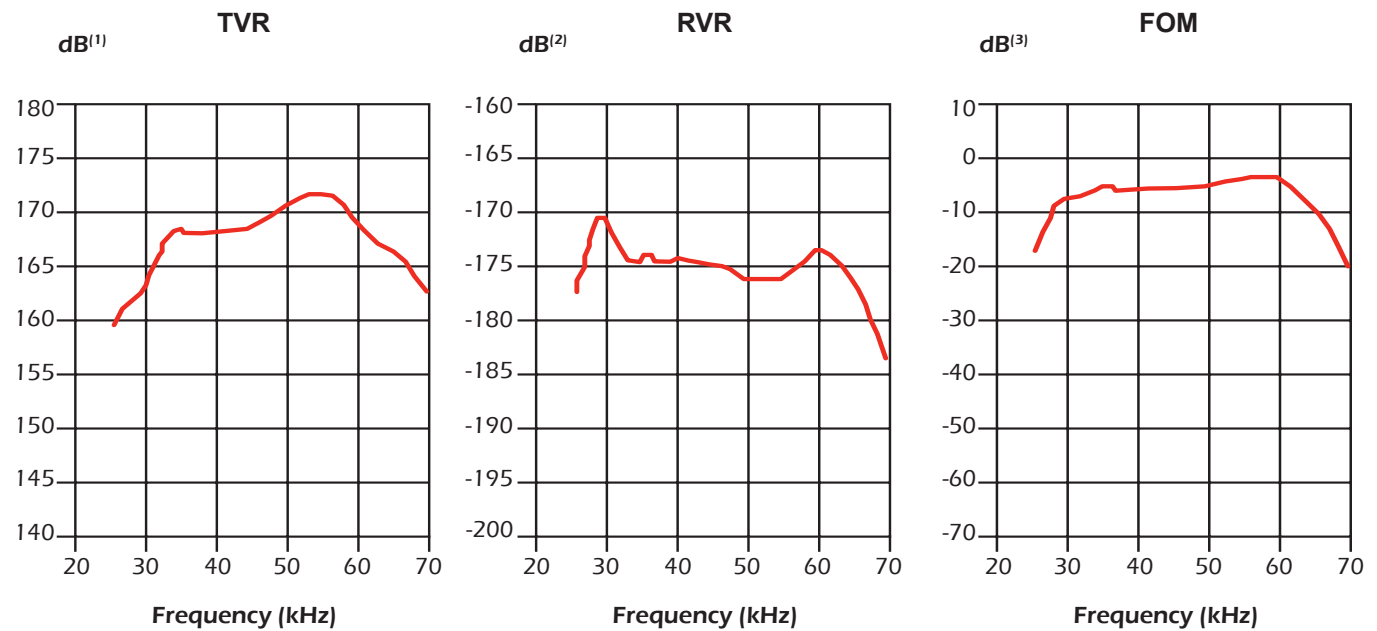
24 x 35.1 mm (1.4 in) PZT  
Active Area: 229.9 cm<sup>2</sup> (35.63 in<sup>2</sup>)  
Radiating Surface: Epoxy

Q ≈ 2

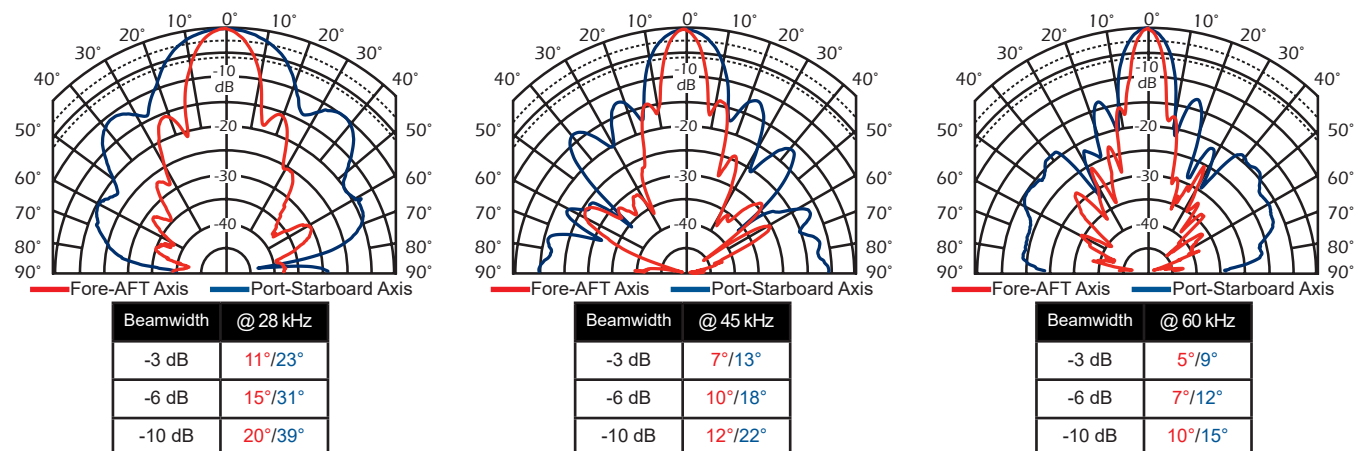
Cable Type: C44  
Cable Length: 15 m (50 ft)

**Notes:**

- (1) dB re 1 μPa per volt at 1 meter
- (2) dB re 1 volt per μPa
- (3) Sum of transmitting voltage response and receiving voltage response
- (4) CW Power ratings is for 20°C seawater temperature. Consult Airmar for different housing CW ratings.



## Transmit Radiation Pattern



# Technical Data Catalog

## 28 to 60 kHz-A (Broadband)

Note: Impedance data includes cable

**Balanced Impedance Table (Nominal Value) in 20°C Water**

Test Frequency (kHz)	Impedance Magnitude (Ω)	Phase Angle (°)	Series Resistance (Ω)	Series Reactance (Ω)	Parallel Conductance (mS)	Parallel Susceptance (mS)	Parallel Resistance (Ω)	Parallel Capacitance (pF)
28.00	308.55	41.79	230.06	205.61	2.42	-2.16	413.81	-12276.03
29.00	318.78	20.93	297.74	113.90	2.93	-1.12	341.31	-6150.87
30.00	241.28	0.87	241.25	3.68	4.14	-0.06	241.31	-335.76
31.00	193.73	-7.41	192.12	-24.97	5.12	0.67	195.36	3416.12
32.00	145.29	-8.06	143.85	-20.37	6.82	0.96	146.74	4798.72
33.00	128.57	-0.01	128.57	-0.01	7.78	0.00	128.57	3.43
34.00	120.78	8.12	119.58	17.05	8.20	-1.17	122.01	-5471.06
35.00	135.55	12.11	132.54	28.44	7.21	-1.55	138.64	-7037.17
36.00	133.81	6.89	132.85	16.04	7.42	-0.90	134.78	-3960.88
37.00	133.31	7.74	132.09	17.95	7.43	-1.01	134.53	-4345.42
38.00	134.75	7.40	133.63	17.35	7.36	-0.96	135.88	-4001.46
39.00	142.01	9.12	140.22	22.52	6.95	-1.12	143.84	-4557.01
40.00	150.97	3.48	150.69	9.16	6.61	-0.40	151.25	-1599.99
41.00	149.39	2.52	149.25	6.58	6.69	-0.29	149.54	-1143.87
42.00	150.47	-1.08	150.45	-2.85	6.64	0.13	150.50	476.71
43.00	148.40	-2.06	148.31	-5.34	6.73	0.24	148.50	897.42
44.00	150.01	-6.28	149.11	-16.40	6.63	0.73	150.92	2636.57
45.00	144.71	-8.59	143.08	-21.61	6.83	1.03	146.35	3650.59
46.00	144.44	-11.83	141.37	-29.62	6.78	1.42	147.57	4912.27
47.00	142.31	-14.82	137.58	-36.40	6.79	1.80	147.21	6085.48
48.00	132.05	-18.07	125.54	-40.97	7.20	2.35	138.91	7789.92
49.00	119.22	-17.44	113.74	-35.74	8.00	2.51	124.97	8165.83
50.00	112.06	-15.52	107.98	-29.99	8.60	2.39	116.31	7601.44
51.00	109.67	-11.32	107.53	-21.53	8.94	1.79	111.84	5586.70
52.00	108.55	-9.99	106.90	-18.82	9.07	1.60	110.22	4889.39
53.00	109.23	-7.10	108.39	-13.50	9.08	1.13	110.07	3397.43
54.00	108.61	-3.96	108.35	-7.50	9.19	0.64	108.87	1872.96
55.00	113.56	2.37	113.46	4.69	8.80	-0.36	113.66	-1053.14
56.00	125.63	6.09	124.92	13.33	7.92	-0.84	126.34	-2399.70
57.00	136.85	9.33	135.04	22.18	7.21	-1.18	138.68	-3306.52
58.00	162.06	10.90	159.14	30.65	6.06	-1.17	165.04	-3202.70
59.00	190.57	7.57	188.91	25.09	5.20	-0.69	192.24	-1863.70
60.00	220.91	1.96	220.79	7.54	4.52	-0.15	221.04	-409.63

## 130 to 210 kHz-B (Broadband)

Transformed to 100 ohms minimum (B1)

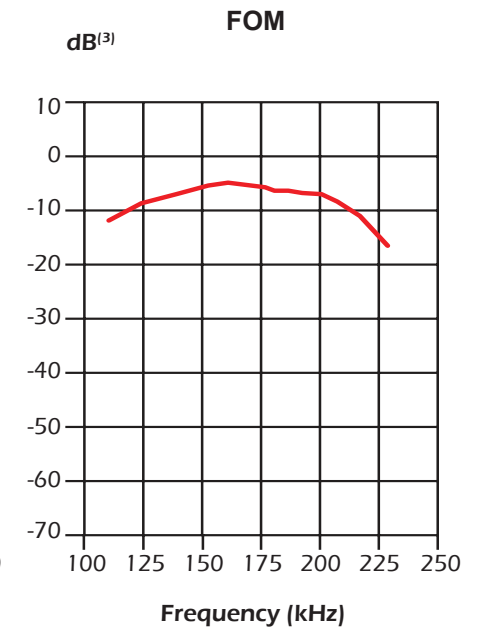
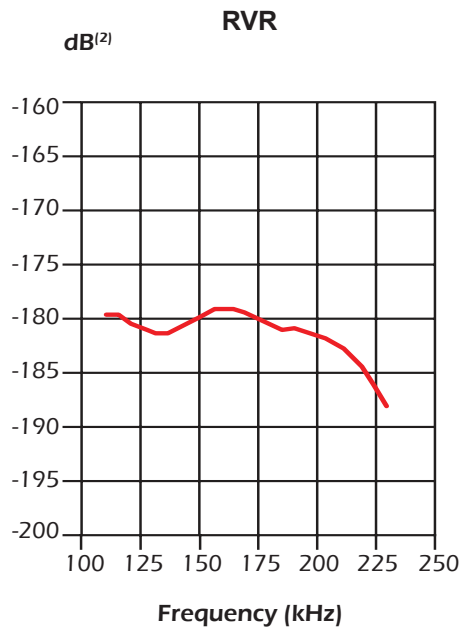
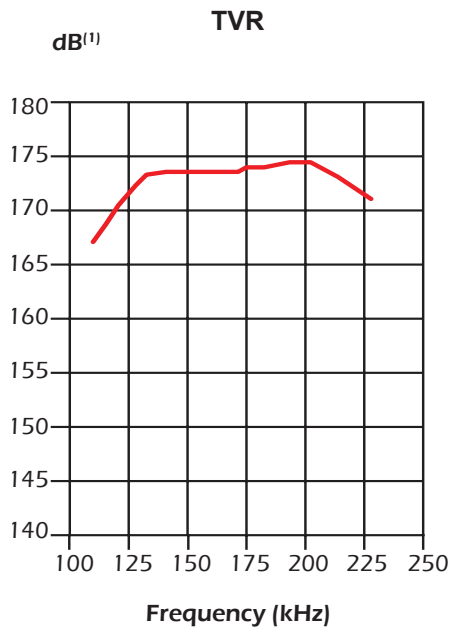
**Power Rating:**

- 2 kW @ 1% duty cycle
- CW<sup>(4)</sup>: 30W in R509, R609  
25W in CM199, CM599,  
PM111, R109,  
R111, R599

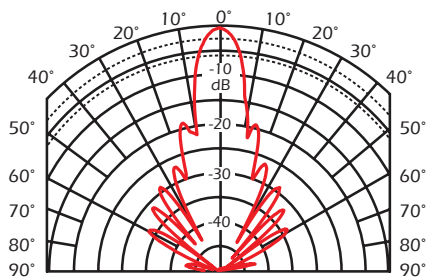
88 mm (3.46 in) PZT  
Active Area: 61 cm<sup>2</sup> (9.4 in<sup>2</sup>)  
Radiating Surface:  
Cast Resin/Urethane  
Q ≈ 2  
Cable Type: C44-02  
Cable Length: 10 m (33 ft)

**Notes:**

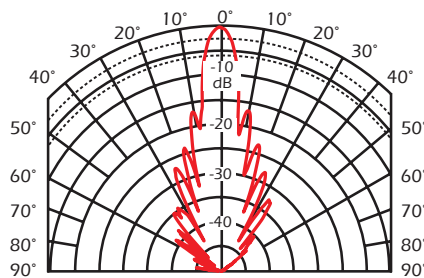
- (1) dB re 1 μPa per volt at 1 meter
- (2) dB re 1 volt per μPa
- (3) Sum of transmitting voltage response and receiving voltage response
- (4) CW Power ratings is for 20°C seawater temperature. Consult Airmar for different housing CW ratings.



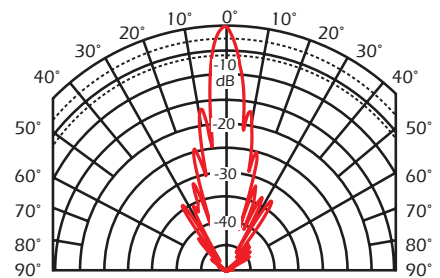
### Transmit Radiation Pattern



Beamwidth	@ 130 kHz
-3 dB	8°
-6 dB	11°
-10 dB	13°



Beamwidth	@ 170 kHz
-3 dB	5°
-6 dB	7°
-10 dB	10°



Beamwidth	@ 210 kHz
-3 dB	4°
-6 dB	6°
-10 dB	8°

# Technical Data Catalog

## 130 to 210 kHz-B (Broadband)

Note: Impedance data includes cable

**Balanced Impedance Table (Nominal Value) in 20°C Water**

Test Frequency (kHz)	Impedance Magnitude (Ω)	Phase Angle (°)	Series Resistance (Ω)	Series Reactance (Ω)	Parallel Conductance (mS)	Parallel Susceptance (mS)	Parallel Resistance (Ω)	Parallel Capacitance (pF)
130.00	127.94	8.78	126.44	19.53	7.72	-1.19	129.46	-1460.93
132.00	123.02	10.90	120.80	23.26	7.98	-1.54	125.28	-1853.13
134.00	121.05	13.32	117.79	27.89	8.04	-1.90	124.39	-2260.49
136.00	120.96	15.92	116.32	33.18	7.95	-2.27	125.79	-2653.65
138.00	123.25	17.77	117.37	37.60	7.73	-2.48	129.42	-2855.27
140.00	126.15	19.31	119.05	41.71	7.48	-2.62	133.67	-2979.87
142.00	130.22	20.36	122.08	45.31	7.20	-2.67	138.90	-2994.68
144.00	134.62	20.96	125.71	48.16	6.94	-2.66	144.16	-2937.23
146.00	140.58	21.15	131.11	50.73	6.63	-2.57	150.73	-2798.26
148.00	146.38	20.82	136.82	52.04	6.39	-2.43	156.61	-2611.53
150.00	151.99	20.04	142.78	52.09	6.18	-2.26	161.79	-2392.65
152.00	158.03	19.08	149.35	51.66	5.98	-2.07	167.22	-2165.81
154.00	164.22	17.90	156.28	50.47	5.79	-1.87	172.57	-1933.80
156.00	171.29	16.51	164.23	48.67	5.60	-1.66	178.65	-1692.44
158.00	178.40	14.26	172.90	43.94	5.43	-1.38	184.07	-1390.72
160.00	184.28	11.31	180.71	36.14	5.32	-1.06	187.93	-1058.56
162.00	188.06	8.40	186.04	27.46	5.26	-0.78	190.09	-762.74
164.00	189.88	6.01	188.84	19.89	5.24	-0.55	190.93	-535.42
166.00	192.52	3.49	192.16	11.73	5.18	-0.32	192.88	-303.52
168.00	195.06	1.24	195.02	4.22	5.13	-0.11	195.11	-105.03
170.00	197.94	-1.87	197.84	-6.45	5.05	0.16	198.05	154.07
172.00	198.12	-5.23	197.30	-18.05	5.03	0.46	198.95	425.59
174.00	194.54	-8.52	192.39	-28.82	5.08	0.76	196.71	696.49
176.00	190.16	-10.57	186.94	-34.87	5.17	0.96	193.44	872.03
178.00	186.73	-11.85	182.76	-38.33	5.24	1.10	190.80	982.98
180.00	184.49	-12.89	179.83	-41.17	5.28	1.21	189.26	1069.46
182.00	185.09	-14.50	179.20	-46.33	5.23	1.35	191.18	1182.68
184.00	183.65	-16.45	176.13	-52.01	5.22	1.54	191.49	1333.73
186.00	180.37	-18.38	171.17	-56.88	5.26	1.75	190.07	1496.00
188.00	176.24	-19.05	166.59	-57.53	5.36	1.85	186.45	1567.92
190.00	174.66	-19.31	164.83	-57.77	5.40	1.89	185.08	1586.24
192.00	176.38	-19.83	165.92	-59.85	5.33	1.92	187.50	1594.63
194.00	178.00	-20.95	166.23	-63.65	5.25	2.01	190.60	1648.06
196.00	178.44	-22.22	165.18	-67.48	5.19	2.12	192.75	1721.01
198.00	178.66	-23.43	163.93	-71.03	5.14	2.23	194.71	1788.71
200.00	179.18	-24.11	163.55	-73.19	5.09	2.28	196.30	1814.16
202.00	182.61	-24.65	165.96	-76.18	4.98	2.28	200.93	1799.86
204.00	188.44	-25.97	169.42	-82.51	4.77	2.32	209.60	1812.81
206.00	195.13	-28.35	171.73	-92.67	4.51	2.43	221.73	1880.22
208.00	198.99	-31.52	169.64	-104.03	4.28	2.63	233.43	2010.11
210.00	200.43	-34.90	164.38	-114.68	4.09	2.85	244.39	2163.56