

## MC21P MICROPHONE (FREE FIELD)

**MC21P** is a condenser type microphone, externally polarized (200V) with standard ½" diameter. The frequency response, optimized for free field, is flat from 3.15 Hz to 20 kHz.



### Applications

- Acoustic measurements with frontal source
- Class 1 precision sound pressure level measurements
- Optimized free field response
- Laboratory Measurements

*Free field microphones are used to measure the existing sound pressure before the microphone is inserted into the acoustic field. The body of the microphone in fact, with its shape and its dimensions, influences the sound field, due to reflection and diffraction phenomena, mainly at high frequencies, where the wavelength of the sound is comparable to the dimensions of the microphone capsule. This phenomenon is physically manifested (disturbance of the acoustic field) with an increase of sound pressure mainly at high frequencies (above 1kHz). The microphones are then compensated to linearize the response in order to obtain a linear free field frequency response curve.*

TAB 1

Model	MC21P
<b>Technical Specifications</b>	
Nominal diameter	½"
Precision class	1
Acoustic Response	Free Field
Frequency range	3.15Hz ÷ 20KHz (±2dB)
Polarization (V)	200
Sensitivity (dB re. 1V/Pa)	-27
Nominal sensitivity (mV/Pa)	44.5
Temperature range	-40 ÷ +150 °C
Temperature coefficient	- 0.006 dB/°C
Pressure coefficient	-1.0x10 <sup>-5</sup> dB/Pa
Capacity (pF)	15
Max level (dB)	146
Intrinsic noise (A weighted)	15
Membrane material	Nickel
Dimensions (mm)	13.2 (diam) x 16.3
Standard (IEC 61094-4)	WS2F

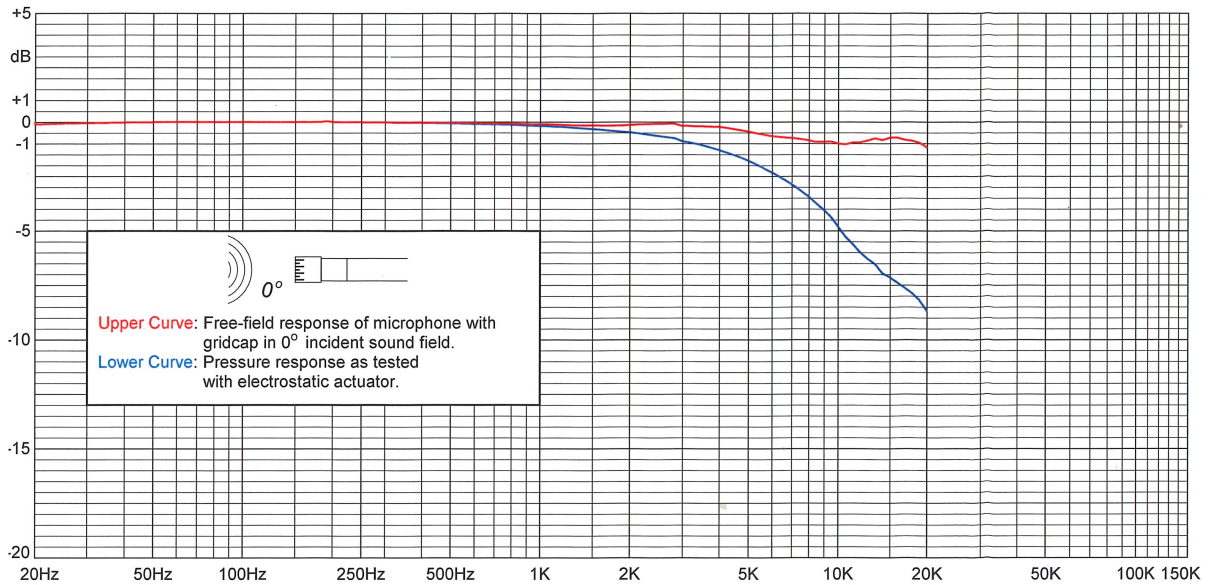
### MICROPHONE DRIFTS

Microphone drift coefficient	Value	Maximum Drift [dB]
Ct – temperature	-0.006dB/°C	± 0.3
Cp – static pressure	-0.01dB/kPa	± 0.2
Cu – relative humidity	-	± 0.3

Drift coefficients of acoustic sensitivity, due to temperature and static pressure, generating the sensitivity of microphone-preamplifier-instrument chain to drift (within the limits specified for class 1 according to IEC 61672: 2002). Validity of coefficients: temperature range -10° C to + 50° C; static pressure range 65 kPa to 108 kPa; relative humidity range 25% to 90%

**Open Circuit Sensitivity @ 1014.7 mbar & 251.19 Hz**  
 -27.01 dB re 1V/Pascal  
 44.63 mV/Pascal  
 +0.99 K<sub>0</sub> (-dB re 50 mV/Pascal)  
**Expanded Uncertainty @ ~95% confidence level**  
 0.18 dB

**Capacitance @ 251.2 Hz**  
 19.4 pF  
**Lower Limiting Frequency**  
 -3 dB @ 1.25 Hz  
**Test Conditions:**  
 Polarization Voltage 200 V  
 Ambient Pressure 1014.7 mbar  
 Temperature 24.1 °C  
 Relative Humidity 31.5 %



**Frequency Response (0 dB @ 251.19 Hz)**  
**Free-field and actuator response with reference to level at 251.19 Hz**

Freq (Hz)	Upper (dB)	Lower (dB)	Freq (Hz)	Upper (dB)	Lower (dB)	Freq (Hz)	Upper (dB)	Lower (dB)	Freq (Hz)	Upper (dB)	Lower (dB)	Freq (Hz)	Upper (dB)	Lower (dB)
19.95	-0.09	-0.09	501.19	-0.03	-0.05	1883.65	-0.16	-0.44	4216.97	-0.26	-1.39	9440.61	-0.89	-4.31
25.12	-0.05	-0.05	630.96	-0.05	-0.08	1995.26	-0.13	-0.46	4466.84	-0.32	-1.51	10000.00	-0.98	-4.80
31.62	-0.02	-0.02	794.33	-0.07	-0.12	2113.49	-0.11	-0.50	4731.51	-0.39	-1.64	10592.54	-1.02	-5.26
39.81	0.00	-0.00	1000.00	-0.10	-0.17	2238.72	-0.09	-0.54	5011.87	-0.44	-1.78	11220.19	-0.94	-5.59
50.12	0.01	0.01	1059.25	-0.11	-0.19	2371.37	-0.08	-0.59	5308.84	-0.51	-1.93	11885.02	-0.94	-5.98
63.10	0.01	0.01	1122.02	-0.12	-0.20	2511.89	-0.08	-0.64	5623.41	-0.57	-2.10	12589.25	-0.85	-6.27
79.43	0.01	0.01	1188.50	-0.13	-0.22	2660.73	-0.07	-0.69	5956.62	-0.63	-2.28	13335.21	-0.75	-6.51
100.00	0.01	0.01	1258.93	-0.14	-0.24	2818.38	-0.07	-0.73	6309.57	-0.68	-2.48	14125.38	-0.83	-6.93
125.89	0.01	0.01	1333.52	-0.15	-0.26	2985.38	-0.17	-0.87	6683.44	-0.71	-2.68	14962.36	-0.72	-7.12
158.49	0.01	0.01	1412.54	-0.15	-0.29	3162.28	-0.18	-0.93	7079.46	-0.73	-2.90	15848.93	-0.72	-7.36
199.53	0.01	0.01	1496.24	-0.15	-0.31	3349.65	-0.19	-1.00	7498.94	-0.77	-3.14	16788.04	-0.81	-7.60
251.19	0.00	0.00	1584.89	-0.15	-0.34	3548.13	-0.20	-1.09	7943.28	-0.83	-3.39	17782.80	-0.86	-7.84
316.23	-0.01	-0.01	1678.80	-0.16	-0.37	3758.37	-0.21	-1.18	8413.95	-0.90	-3.69	18836.49	-0.96	-8.17
398.11	-0.02	-0.03	1778.28	-0.17	-0.40	3981.07	-0.22	-1.28	8912.51	-0.91	-3.98	19952.62	-1.16	-8.66

Typical Free Field and Pressure Field frequency responses of MC21P microphone