

CO-Z A Perfect Omni-Directional Microphone from Sanken(PAT.PEND)

Sanken has the distinction of creating the CO-Z, a revolutionary microphone with a perfect OMNI polar pattern from 20Hz to 20kHz. Many microphone manufacturers have attempted to make the perfect omni, but because of the physical existence of the microphone itself, it has been a considerable challenge. Previous omni directional microphones have a "directional" polar pattern in higher frequencies. This limitation was believed to be the brick wall of omni microphones. But now, Sanken's exclusive technology permits the perfect omni microphone – one which seems to have no physical body — with a "virtual" diaphragm hovering in space. Another groundbreaking design from the World's Most Original Microphone Manufacturer.

Diffraction Effect:

All of "wave" has two characteristics in its transmission.

CO-Z has 2 capsules M1 & M2. In case of M1, wavelength of M1 capsule diameter has peak frequency response at on axis signal.

When the second capsule (M2) is set on the same axis but vertically 1/2 capsule diameter distance lower than M1, M2 frequency response has depth at the same frequency of capsule diameter because of 1/2 wavelength delayed reach of signal from on axis.

Therefore, when M1 signal and M2 signal summed, then frequency from on axis becomes "flat". On the other hand, signal from 90° side is reach to both M1 and M2 in the same time. Therefore, there is no depth and peak at frequency response regarding the signal from 90° side. When we carefully adjust the level from all of angles towards capsules, we can get same sensitivity from signals from all of angles into the capsules. The same thing can be said the sound from 180° rear side.

This is the basic theory of Sanken Perfect Omni; CO-Z. Therefore, CO-Z can have almost perfect circle polar pattern in 10 kHz.

From phase point of view, we can recognize that this is only one "virtual" diaphragm in the center position between M1 and M2. Therefore, in this position, we can understand that phase coherence is kept precisely.

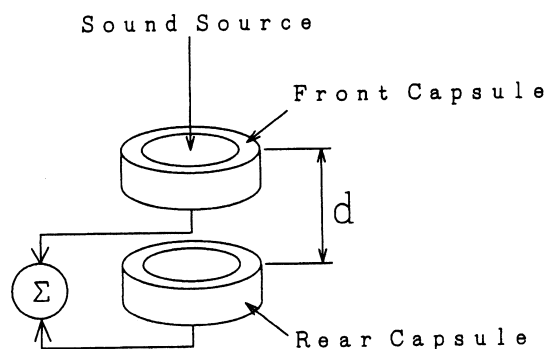
Normally, in case of "Omni" microphones in the market has "on axis directivity" especially high

frequency, sensitivity from 180° rear side is more than 10dB lower than it on axis, in case of 20kHz, sensitivity from 180° rear is 35dB lower than on axis. In case of CO-Z, even in 20kHz, sensitivity from 180° rear is only 10dB lower than on axis.

There is a slide switch on CO-Z, this is a switch to have M1, M2 summed signal(perfect omni)(in the beta drawing it's shown as flat sign), and another position is only from capsule M1, no connection with the signal from M2, therefore as you see, the polar pattern in this position moved to axis direction, and have oval-ellipse shape. Sound characteristic in this position is quite similar to normal omni microphone. Energy from "on axis" is stronger in high frequency, and rear and side sensitivity becomes lower than Axis. Thus "sound" looks sharp at on axis side, especially in high frequency. This switch is prepared for the engineer who wants to record higher frequency signal from on axis a bit more than other directions. This usage is similar to conventional omni microphone. (in the Beta model, this position shows "high boost" sign.)

But, this sign "flat" and "high boost" will easily make misunderstanding among users.

As I said above, this switch is just selecting summing M1 and M2, or signal from just M1. We decided, that M1 plus M2 position should have circle mark with flat line, and only M1 position should have "on axis" letter and high-increased line .



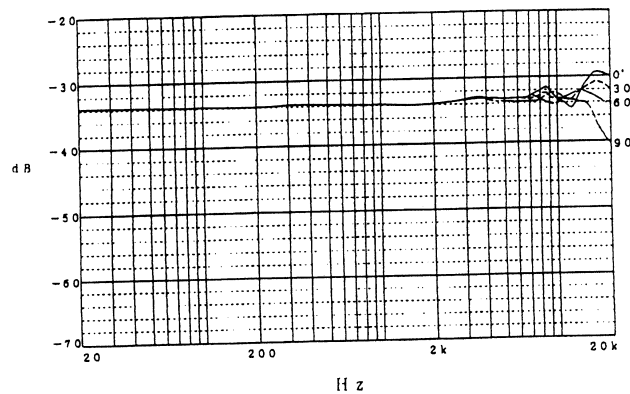
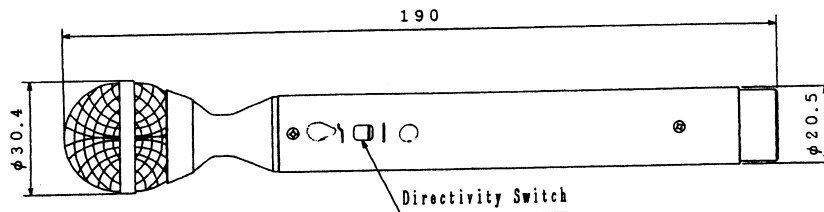
Layout of two capsules

CO-Z High Resolution Omni Directional Microphone

Specifications

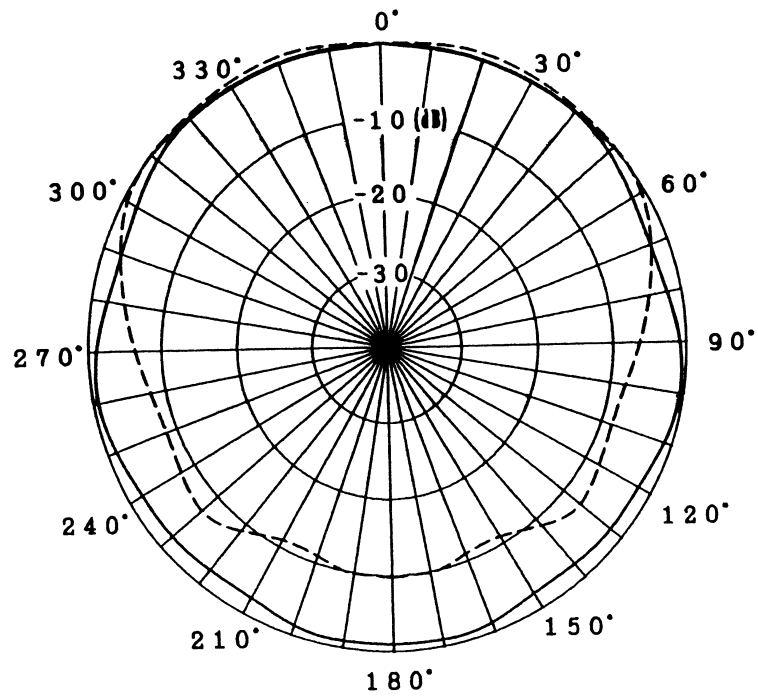
Transducer Type	DC biased condenser
Directional Pattern	Omni Directional
Sensitivity	-27dB (44.7mV) \pm 1dB (0dB=1V/Pa)
Frequency Response	20Hz-20kHz
Equivalent Noise Level	17dB or less (A weighted rms,IEC179)
Output Impedance	200 Ω
Maximum SPL for1% THD at 1kHz	137dB
Powering	48V Phantom \pm 4V
Current Consumption	3.8mA
Output Connector	Pin 1=ground, Pin 2=audio (positive), Pin 3=audio
Dimensions	190mm long by 30.4mm diameter (7.48in \times 1.20in)
Weight	150g
Case	Brass
Finish	Fired Painted, Lusterless Black (Soft Touch Coating)

CO-Z dimension drawing



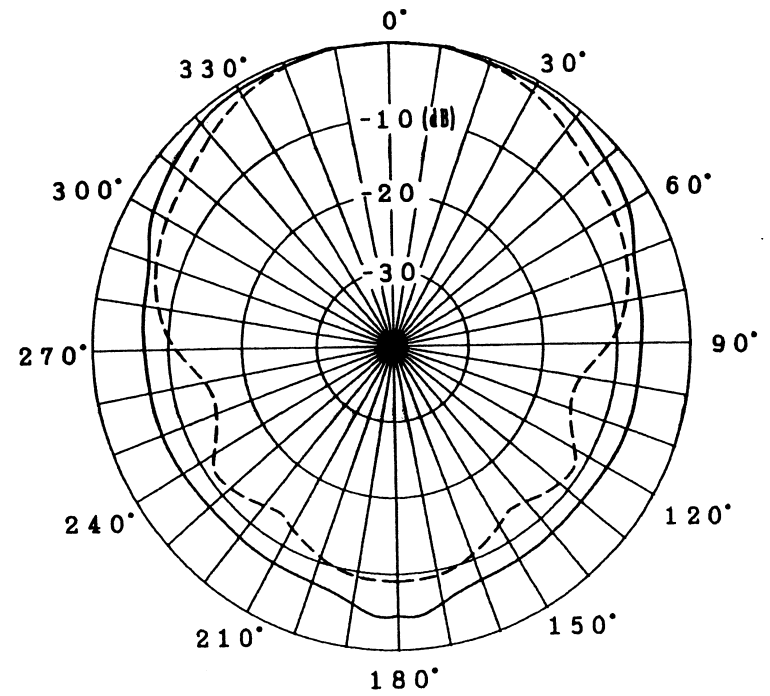
CO-Z Polar Pattern

Polar Circle Position



— at 10 kHz
- - - at 20 kHz

Polar Ellipse Position



— at 10 kHz
- - - at 20 kHz