

# Measuring Microphones, Studio Microphones, Hydrophones and Accessory Equipment

## Horn-coupled Probe Microphone

type 4170

### FEATURES:

- Wide frequency range 30Hz to 8kHz
- High sensitivity
- High acoustic impedance
- All data individually calibrated and supplied
- Small size and low weight

### USES:

- Measurements in the ear
- Measurements inside intricate machinery
- Measurements in sound-insulating materials
- Acoustical studies of musical instruments
- Measurements in exhausts, burners, and chimneys

The probe Microphone Type 4170 is a high precision measuring microphone having the same excellent performance as the other B & K measuring microphones.

The microphone is calibrated and delivered with a calibration chart giving the frequency response and all data necessary for accurate measurements.

It is designed to cover a wide range of measurements where minimum disturbance of the sound field is important. This is achieved by giving the probe a very small diameter and a very high orifice acoustic impedance. The 4170 uses an acoustical exponential horn to couple a very thin probe tube to a 1/2" condenser microphone. The probe is attached to the narrow end of the horn and the microphone is connected to the wide end. An acoustic matching impedance in the microphone end of the horn equalizes the frequency response of the assembly. A frequency response of 30 Hz to 8 kHz within 4dB is thereby obtained (Fig.1).

In order to measure correctly, a probe microphone must be much more sensitive to sound pressures at the probe orifice than it is to sound transmission through the side walls of probe and horn. In the 4170 the sound attenuation of the walls is greater than 20dB at all frequencies between 30 Hz and 10 kHz. Fig. 2 shows the sensitivities of the 4170 with open and closed probe orifice, when placed in a plane sinusoidal sound wave.

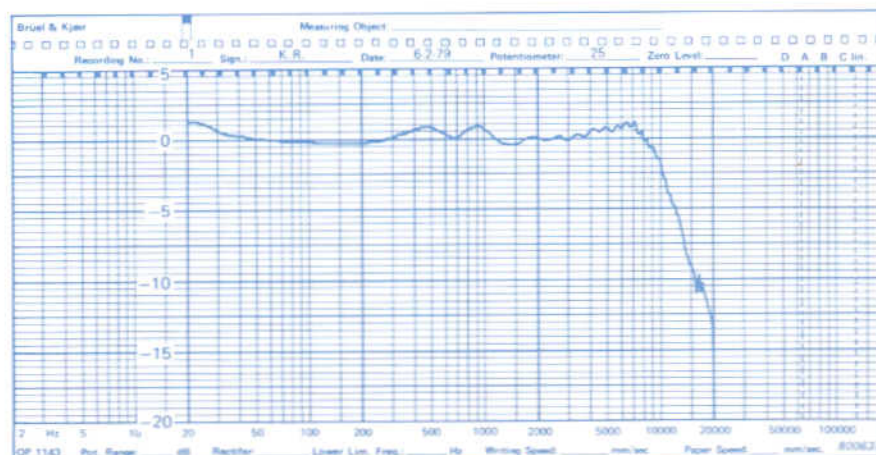


Fig.1 Frequency response of the 4170

An Adaptor DP 0181 for fitting the 4170 to the Pistonphone Type 4220 or the Sound Level Calibrator Type 4230 is supplied for calibration.

The probe has an outer diameter of 1,25 mm at the tip. The horn is 120 mm long. The horn and the probe are normally covered by a stainless steel tube, which protects them and gives them a uniform outer diameter. The protection tube may be removed if the probe only can be inserted at the measuring spot. (See Fig. 3).

The maximum allowable ambient temperature for continuous operation of the 4170 with the protection tube removed is 200°C. For intermittent use, temperatures up to 400°C are permissible. This allows measurement to be carried out inside furnaces, ovens etc. It should be noted that the 4170 should not be used continuously at 400°C or intermittently at greater temperatures. Corrosion processes are accelerated at high temperature, and the tip filter may be affected, thus changing the acoustic impedance at the probe tip.

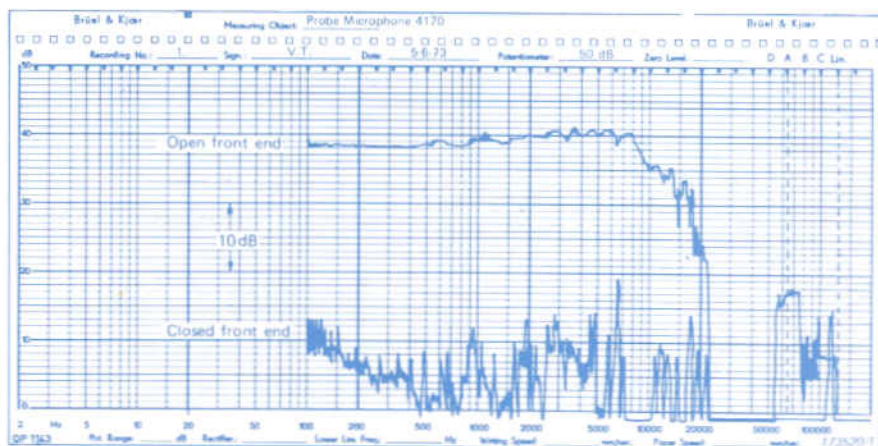


Fig.2. Sensitivities of the 4170 with open and closed probe tube

A preamplifier is mounted inside the handle of the 4170 and connects, via a cable and a standard 7-pin plug, directly to B&K's extensive range of Measuring Amplifiers and Frequency Analyzers.

The built-in preamplifier is electrically and mechanically similar to the B&K 1/2" Microphone Preamplifier

Type 2619 and the condenser microphone used corresponds to the 1/2" Condenser Microphone Type 4134.

For detailed information on the 2619 and the 4134 see data sheets for Microphone Preamplifiers Types 2619, 2627 and 2633 and Condenser Microphone Cartridges Types 4133 to 4166 respectively.

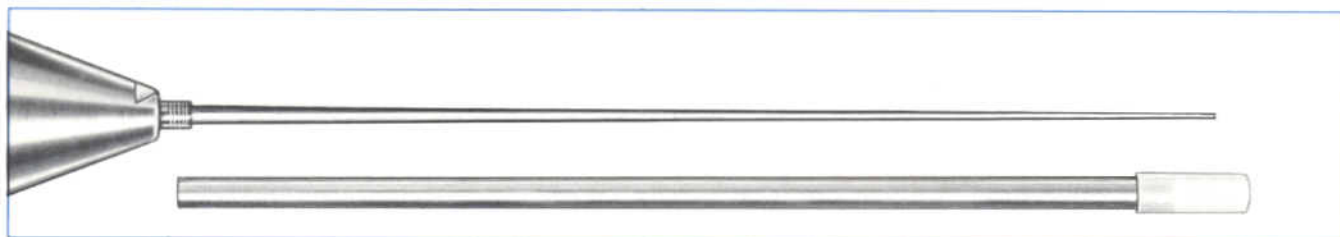


Fig.3. The Probe Microphone with protection tube removed

## Specifications 4170

<p><b>FREQUENCY RESPONSE*:</b> 30 Hz to 8 kHz + 3, -1 dB re 250 Hz</p> <p><b>SENSITIVITY AT 250 Hz*:</b> Typically -58 dB re 1 V/Pa (1,25 mV/Pa)</p> <p><b>DISTORTION:</b> &lt; 1% for SPL's below 170 dB</p> <p><b>ACOUSTIC IMPEDANCE OF PROBE ORIFICE:</b> &gt; <math>4 \times 10^8 \text{ Nsm}^{-5}</math></p>	<p><b>NOISE:</b> <math>11 \times 10^{-3} \text{ Pa}</math> (55 dB re <math>2 \times 10^{-5} \text{ Pa}</math>) (equivalent SPL from 20 Hz to 20 kHz)</p> <p><b>MAXIMUM PERMITTED TEMPERATURE OF PROBE TUBE (25°C ambient):</b> <b>Without Protection Tube:</b> 400°C with intermittent use <b>With Protection Tube:</b> 200°C</p> <p><b>DIMENSIONS:</b> <b>Probe Diameter:</b> 1,25 mm (0,5 in)</p>	<p><b>Diameter of Protection Tube:</b> 5,5 mm (0,22 in) <b>Length of Protection Tube:</b> 170 mm (6,7 in) <b>Maximum Diameter of 4170:</b> 28 mm (1,1 in) <b>Maximum Length of 4170:</b> 315 mm (12,4 in)</p> <p><b>WEIGHT:</b> 300 g (0,66 lb)</p> <p><b>ACCESSORIES INCLUDED:</b> Adaptor DP 0181</p> <p>* Individually calibrated</p>
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