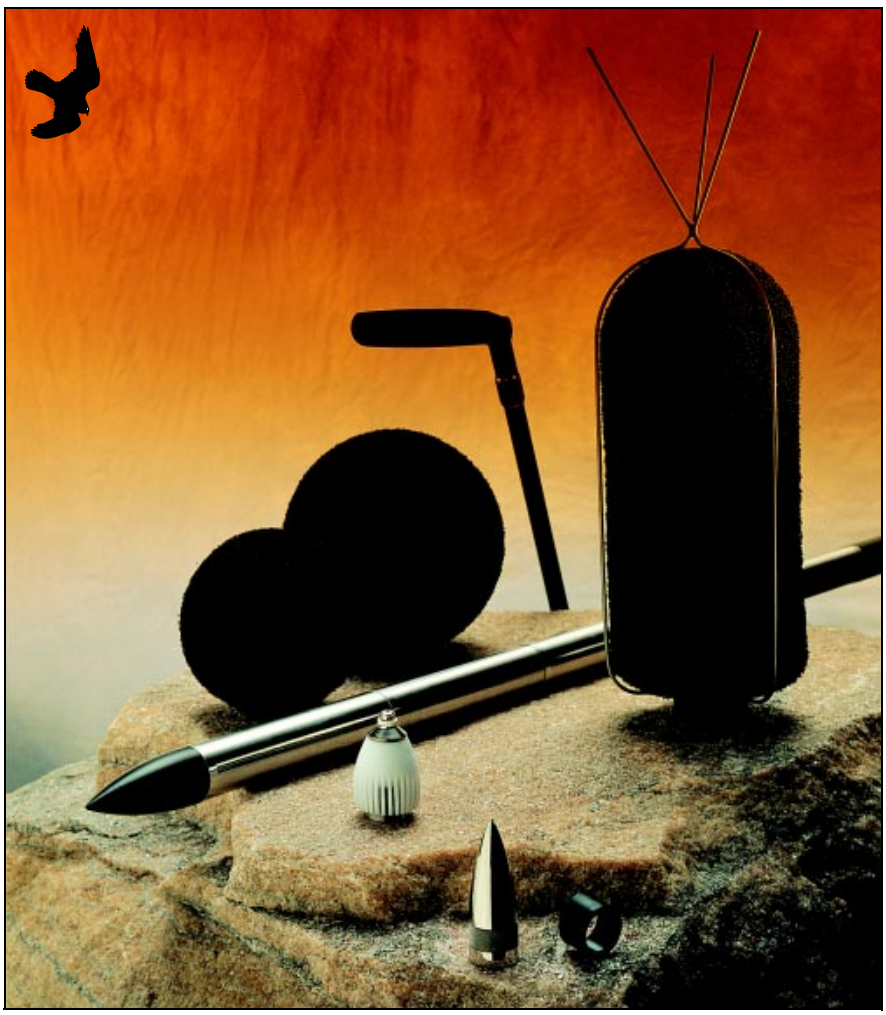
Product Data

Falcon™ Range

Accessories for Falcon™ Range Microphones

Windscreen UA 0237 and UA 0459
Nose Cone UA 0386
Rain Cover UA 0393
Turbulence Screen UA 0436
Permanent Outdoor Windscreen UA 0570
Preamplifier Holder UA 1317

The majority of sound measurements are performed in situations where wind, rain and turbulence are encountered. To facilitate sound measurements under various conditions a variety of accessory equipment has been developed. A description of the accessories for the Falcon™ Range of microphones is given in this Product Data sheet. For further information please refer to the Microphone Handbook Vol. 2 (BA 5105).



Applications

The accessories for the Falcon™ Range microphones have the following main applications:

- Windscreen UA 0237: 90 mm windscreen that reduces wind noise 10 to 12 dB. Primarily for hand-held outdoor applications.
- Windscreen UA 0459: More handy 65 mm windscreen similar to UA 0237, but with slightly reduced wind noise suppression.
- Nose Cone UA 0386: Reduces wind noise at high wind velocities in a known direction, for example in wind tunnels.
- Rain Cover UA 0393: Protects the microphone against rain and adverse weather conditions. Allows permanent outdoor installation. Built-in electrostatic actuator calibrator.
- Turbulence Screen UA 0436: Used for measurements in ducts. Has approx. 16 dB better turbulence noise suppression than UA 386.
- Permanent Outdoor Windscreen UA 0570: For permanent outdoor monitoring installations. Spikes prevent birds from perching.

Falcon™ Range microphones Types 4189, 4190, 4191, 4192 and 4193 are supplied with a unique calibration disk which contains complete free-field correction curves for the accessories above.

Windscreens UA 0237 and UA 0459

Windscreen UA 0237 (Fig. 5), is spherical with a diameter of 90 mm. It is made of specially prepared open-pored polyurethane foam attenuating wind noise 10 to 12 dB, at lower wind velocities, and is suited for hand-held outdoor sound measurements. In use the windscreen is simply pushed as far as it will go over the microphone (fitted with its normal protection grid) and preamplifier. Windscreen UA 0237 is available in packages of six with order number UA 0254. Windscreen UA 0459 (see Fig. 5) is

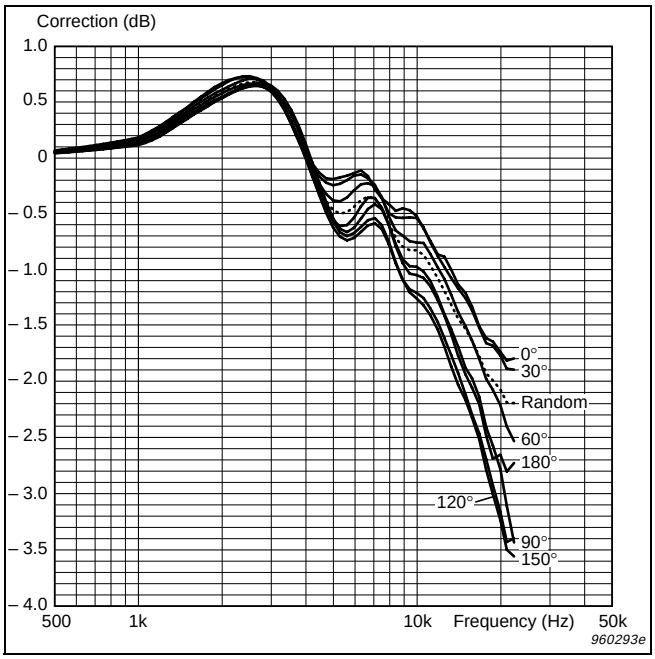


Fig.1 Influence of Windscreen UA 0237 shown as increments to microphone free-field correction curves or responses

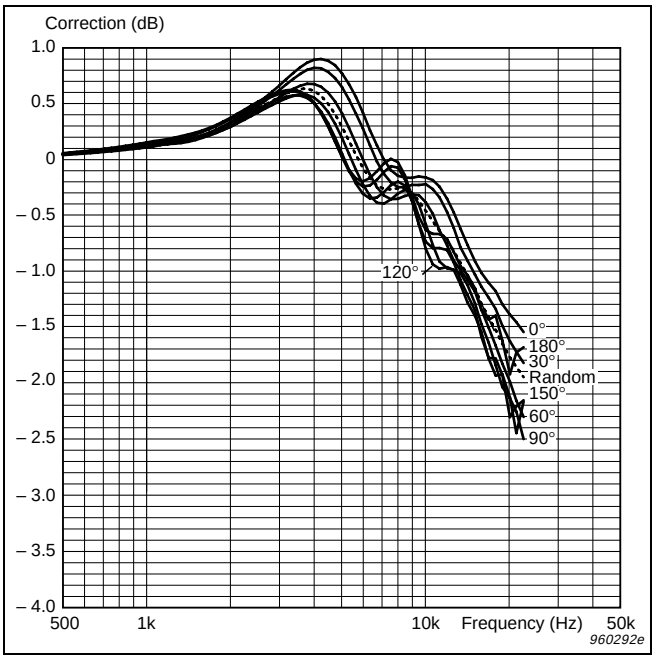


Fig.2 Influence of Windscreen UA 0459 shown as increments to microphone free-field correction curves or responses

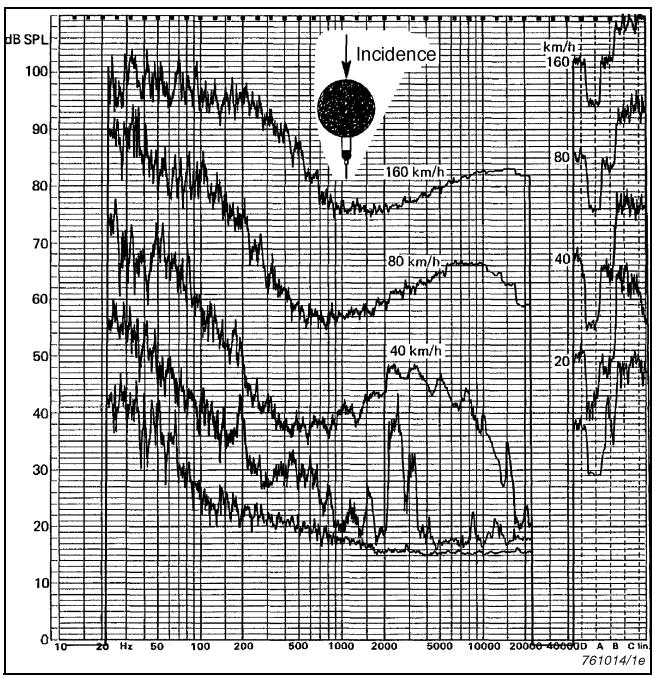


Fig.3 $^1/_3$-octave wind induced noise levels at 0° incidence for Windscreen UA 0237

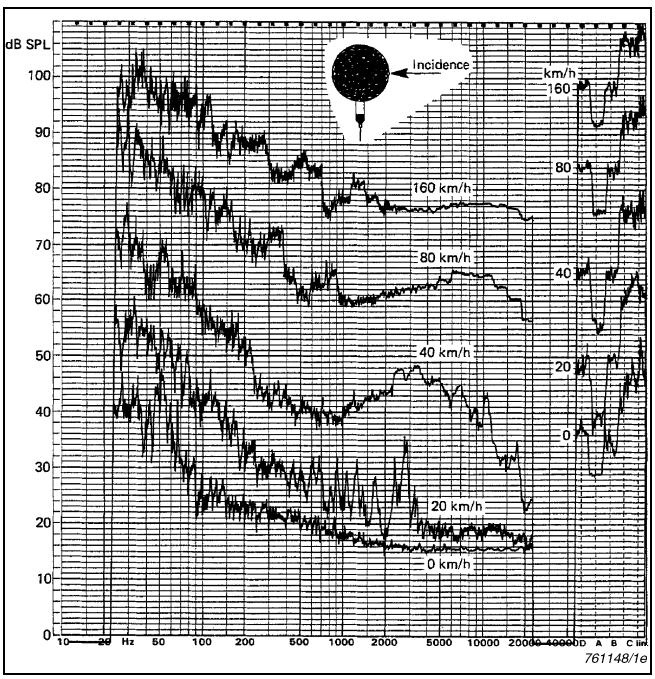


Fig.4 $^1/_3$-octave wind induced noise levels at 90° incidence for Windscreen UA 0237

similar to UA 237, but is smaller with a diameter of 65 mm, and has somewhat reduced wind noise attenuation. Six Windscreens UA 0459 are available as a package UA 0469.

Free-field response corrections for a $^1/_2$″ microphone fitted with Windscreens UA 0237 and UA 0459 are shown in Figs. 1 and 2 respectively. These curves should be added to the normal free-field characteristics of the microphone in use. Wind-induced noise curves for Windscreen UA 0237 at 0° and 90° incidence are shown in Figs. 3 and 4 respectively. Fig. 6 shows the influence of a wet Windscreen UA 0237 compared to a dry windscreen.

Nose Cone UA 0386

Nose cone UA 0386 (Fig. 9) is designed to reduce the aerodynamically induced noise present when the microphone is exposed to high wind speeds in a known direction, for example during sound measurements in wind tunnels, ducts, etc.

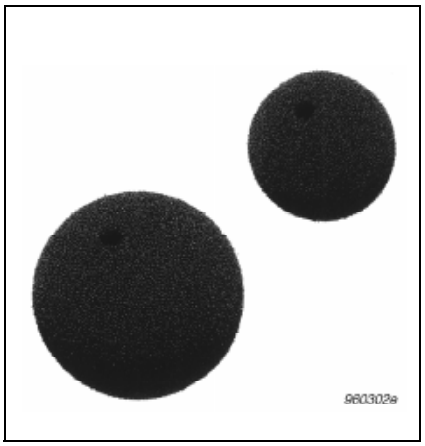


Fig.5 Windscreens UA 0237 (90 mm) and UA 0459 (65 mm)

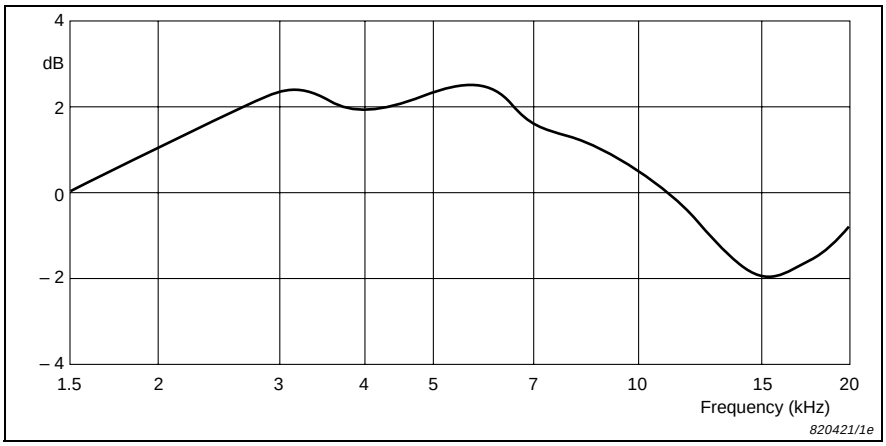


Fig.6 Effect of UA 0237 wet screen compared to dry screen, free-field response at 0° incidence

In use it replaces the normal protection grid of the microphone. It has a streamlined shape with a highly polished surface in order to give the least possible resistance to air flow and thereby reduce the noise produced by the presence of the microphone itself.

The fine wire mesh around the nose cone permits sound pressure transmission to the microphone diaphragm while a truncated cone behind the mesh reduces the air volume in front of the diaphragm.

Fig. 7 shows the free-field corrections curves that apply for using the nose cone. Fig. 8 shows the typically wind induced noise levels at various wind-speeds for a $^1/_2$″ microphone fitted with Nose Cone UA 0386. Fig. 10 shows a typical free-field response for a Microphone Type 4191 fitted with Nose Cone UA 0386.

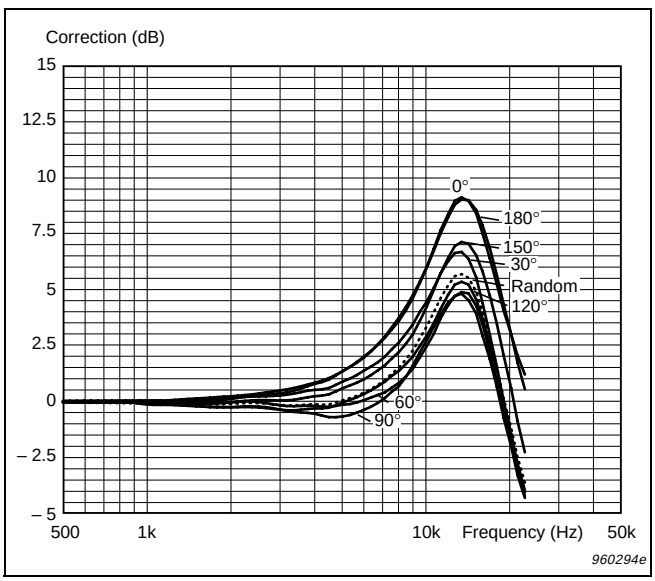


Fig.7 Free-field correction curves for $^1/_2$″ Microphone Type 4191 fitted with Nose Cone UA 038

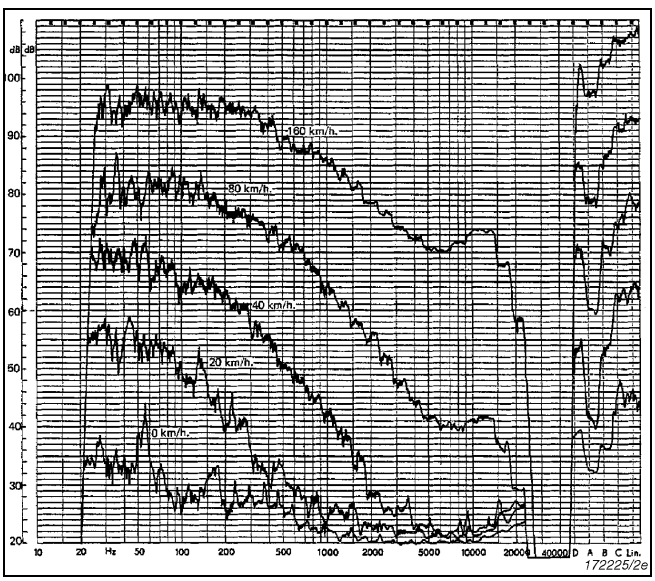


Fig.8 $^1/_3$-octave wind induced noise levels at 0° incidence for a $^1/_2$″ microphone fitted with Nose Cone UA 0386

Fig.9 Nose Cone UA 0386

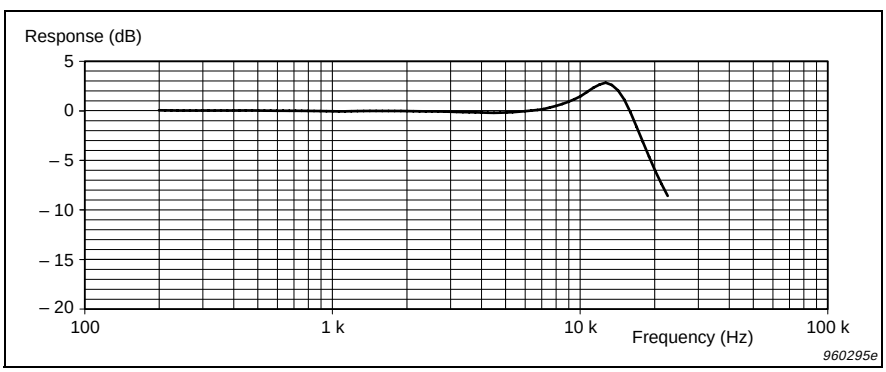


Fig.10 Typical free-field response at 0° incidence for $^1/_2$″ Microphone Type 4191 with Nose Cone UA 0386

Rain Cover UA 0393

The rain cover (Fig. 13) is mounted on the microphone instead of the normal protection grid, and allows permanent outdoor installation even under adverse weather conditions. It is important to mount the unit upright, the microphone diaphragm facing straight up. As well as rain protection the rain cover serves as an electrostatic actuator calibrator which can be excited for remote calibration. The actuator can generate an equivalent SPL of 80 to 90 dB if you apply 215 VAC to the terminals. If you require higher accuracy, the SPL can be adjusted at Brüel & Kjær to 90 dB ±1 dB on request, but only with a specific microphone.

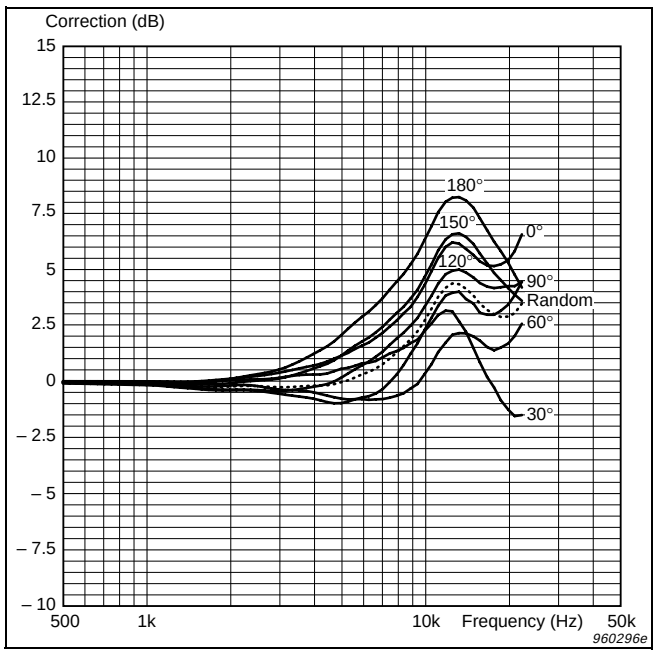


Fig. 11 Free-field correction curves for 1/2″ Microphone Type 4190 with Rain Cover UA 0393 and Dehumidifier UA 0308

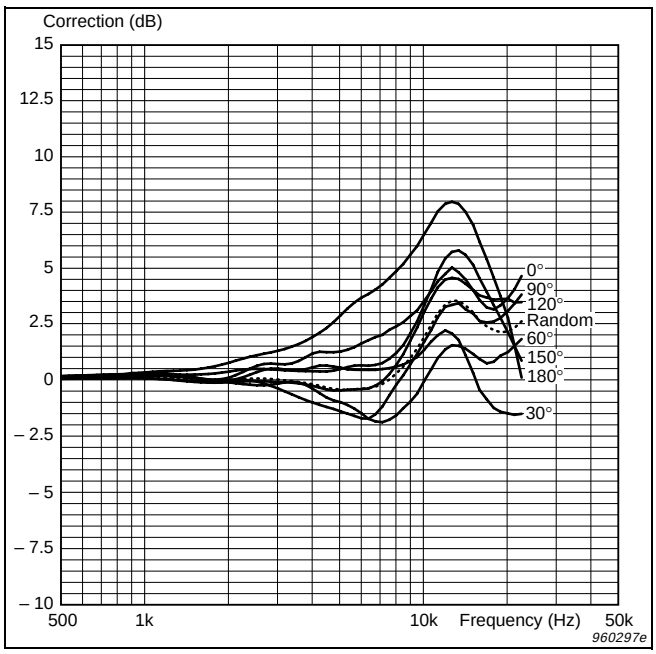


Fig. 12 Free-field correction curves for 1/2″ Microphone Type 4190 with Permanent Outdoor Windscreen UA 0570, Rain Cover UA 0393 and Dehumidifier UA 0308

Fig. 13 Rain Cover UA 0393

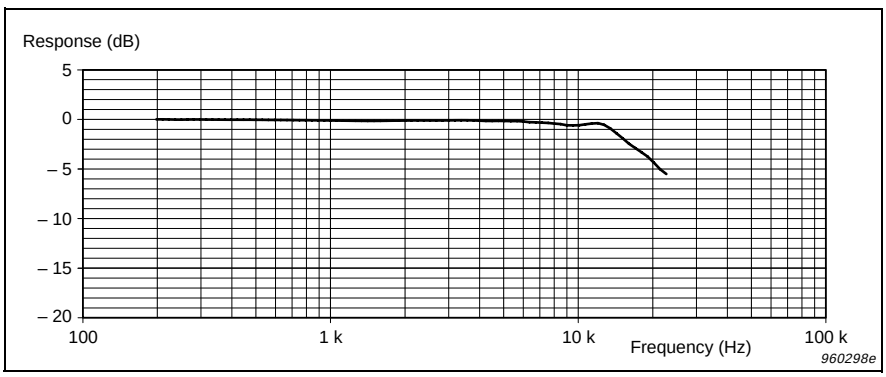


Fig. 14 Typical free-field response at 0° incidence for 1/2″ Microphone Type 4190 with Rain Cover UA 0393 and Dehumidifier UA 0308

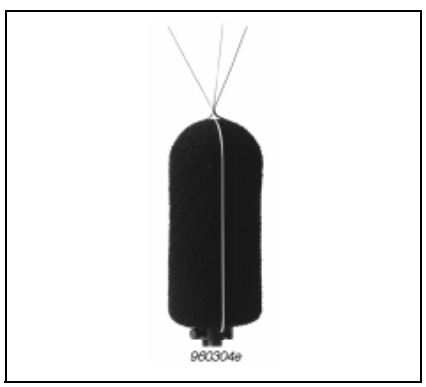


Fig. 15 Windscreen UA 0570

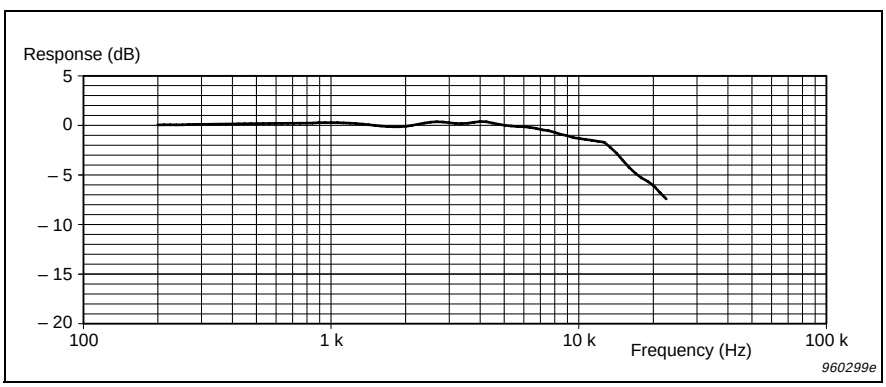


Fig. 16 Typical free-field response at 0° incidence for 1/2″ Microphone Type 4190 with Windscreen UA 0570, Rain Cover UA 0393 and Dehumidifier UA 0308

The influence of Rain Cover UA 0393 is shown in Fig. 11 as free-field corrections curves for various angles of incidence with a microphone Type 4190. A combination of Microphone Type 4189, 4190 or 4191, Rain Cover UA 0393, Dehumidifier UA 0308 and Windscreen UA 0570 meets the requirements of IEC 651 Type 1 and is suitable for outdoor installations in all weather.

The typical 0° free-field response for a Microphone Type 4190 with Rain Cover UA 0393 is illustrated in Fig. 14.

Permanent Outdoor Windscreen UA 0570

The Permanent Outdoor Windscreen UA 0570 (Fig. 15) is recommended for use in all unattended outdoor monitoring applications. The windscreen is made from a specially prepared porous polyurethane foam which is resistant to humid and corrosive atmospheres and is supported by three stainless steel rods which protrude as spikes to prevent birds from resting on top. The design of the foam screen and stainless steel frame provides excellent long term mechanical stability.

It is recommended that, whenever weather protection is important, the Permanent Outdoor Windscreen UA 0570 is always used in conjunction with the Rain Cover UA 0393 and Dehumidifier UA 0308. Fitting the windscreen on the microphone and preamplifier assembly is done by inserting the assembly into the hard

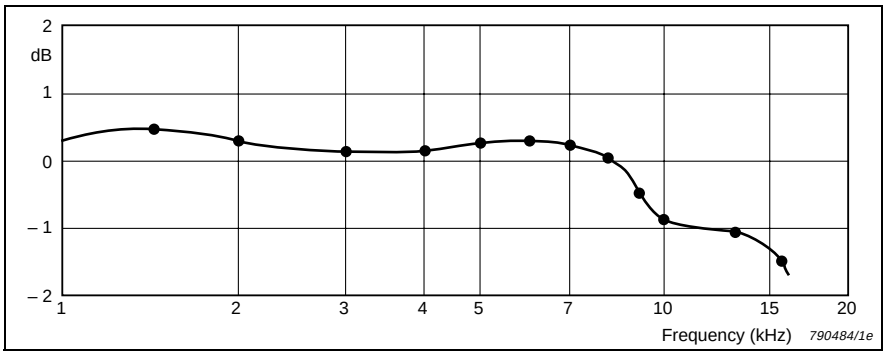


Fig. 17 Effect of wet screen on the attenuation of Windscreen UA 0570

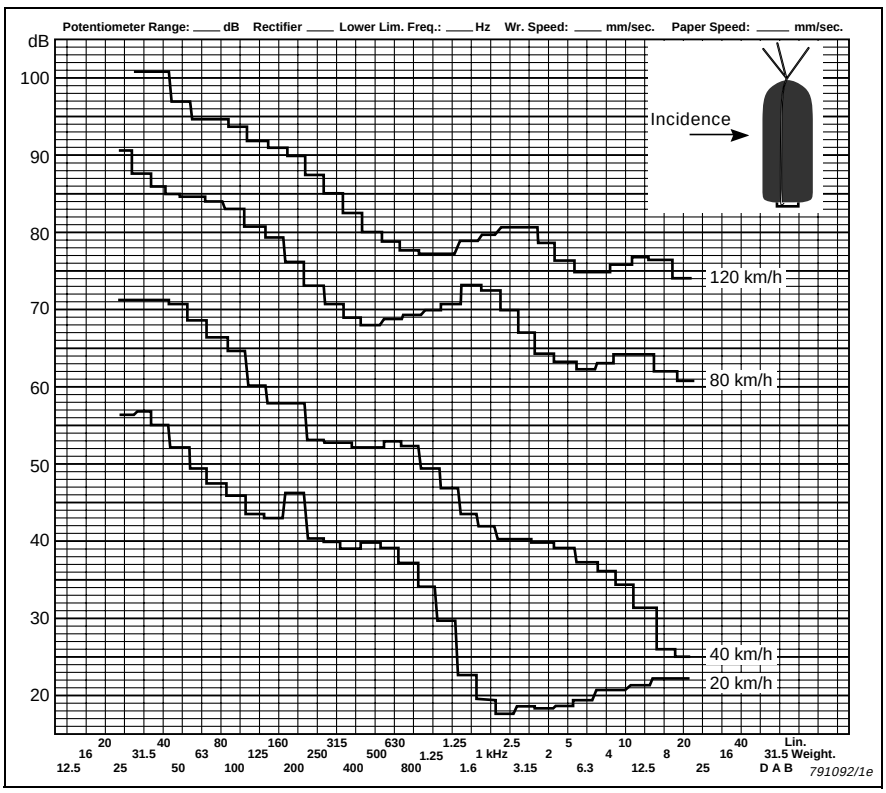


Fig. 18 90° incidence wind induced noise levels for a $^1/_2$″ microphone fitted with Rain Cover UA 0393 mounted inside Windscreen UA 0570

Fig. 19 Calibration disk containing data for Falcon™ Range microphones in combination with Falcon™ Range accessories

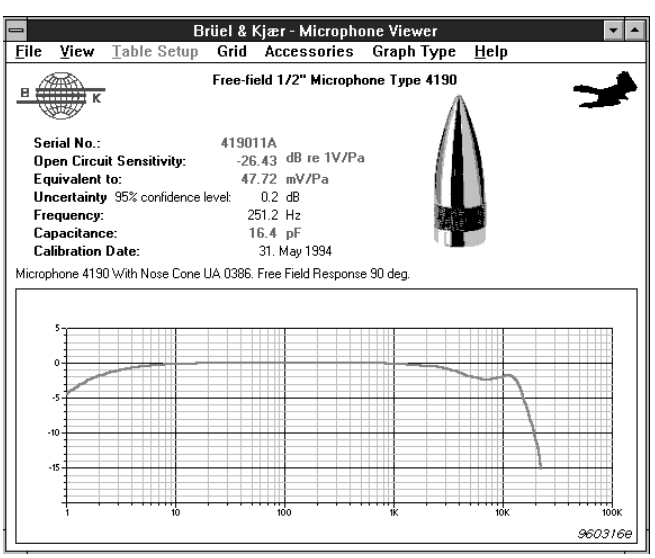


Fig. 20 Example of a 90° free-field response for a microphone fitted with Nose Cone UA 0386 as displayed with the Microphone Viewer

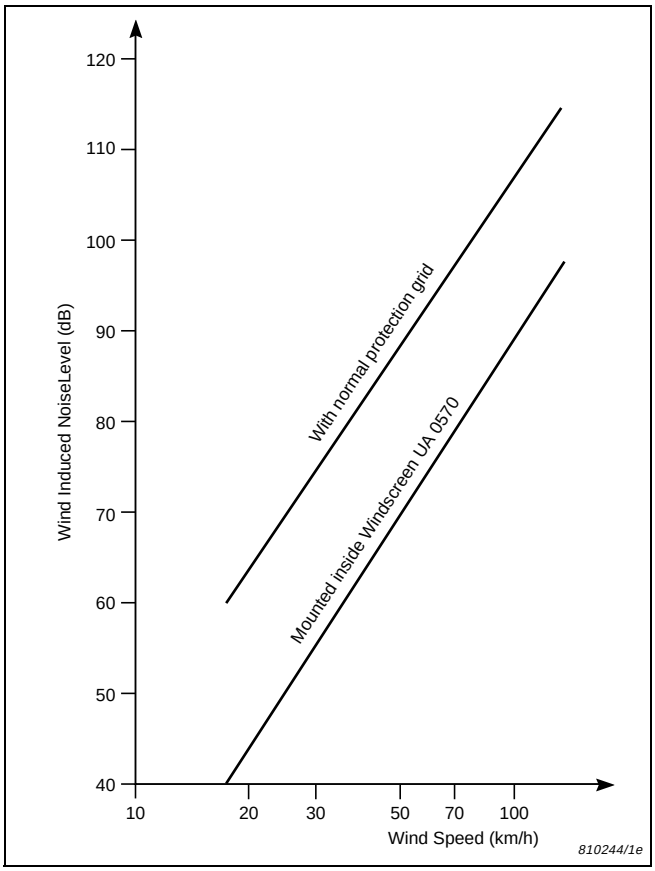


Fig. 21 A-weighted wind induced noise level as a function of wind speed for a $^1/_2$″ microphone fitted with Rain Cover UA 0393 mounted inside Windscreen UA 0570

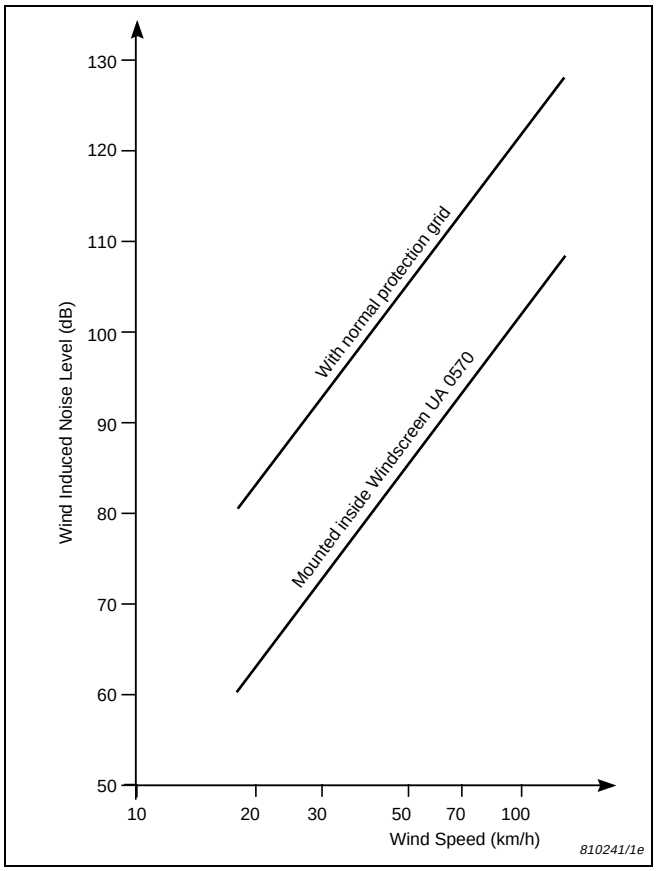


Fig. 22 Linear wind induced noise level as a function of wind speed for a $^1/_2$″ microphone fitted with Rain Cover UA 0393 mounted inside Windscreen UA 0570

plastic conical ring at the base of the windscreen and securing it with a nylon screw.

The windscreen UA 0570 effectively reduces wind induced noise of the order of 15 dB for wind-speeds up to 120 km/h. Figs. 21 and 22 show wind induced noise levels for different wind speeds for a $^1/_2$″ microphone fitted with Rain Cover UA 0393 and Dehumidifier UA 0308 fitted inside Windscreen UA 0570. The attenuation of a wet screen differs from that of a dry screen by only ±0.5 dB up to 9 kHz as shown in Fig. 17.

A typical frequency response at 0° incidence is shown in Fig. 16 for a Microphone Type 4190. Fig. 12 shows typical free-field correction curves at various angles of incidence for a Microphone Type 4190 fitted with Windscreen UA 0570, Rain Cover UA 0393 and Dehumidifier UA 0308.

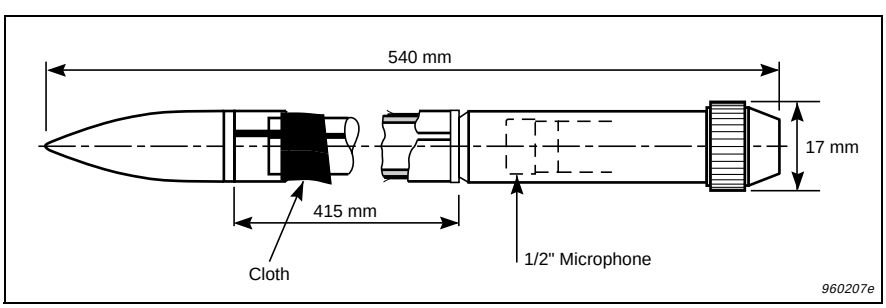


Fig. 23 Dimensions of Turbulence Screen UA 0436

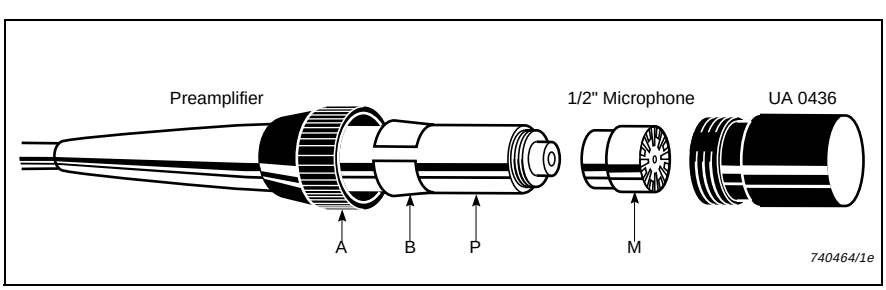


Fig. 24 Assembly of Turbulence Screen UA 0436, microphone and preamplifier

Turbulence Screen UA 0436

The Turbulence Screen UA 0436 (Fig. 25) is designed to attenuate turbulence noise, when measuring airborne noise in ducts, wind tunnels etc. The UA 0436 can be used together with any $^1/_2$″ free-field condenser microphone mounted on a $^1/_2$″ microphone preamplifier. The microphone and preamplifier assembly is mounted

Fig. 25 Turbulence Screen UA 0436

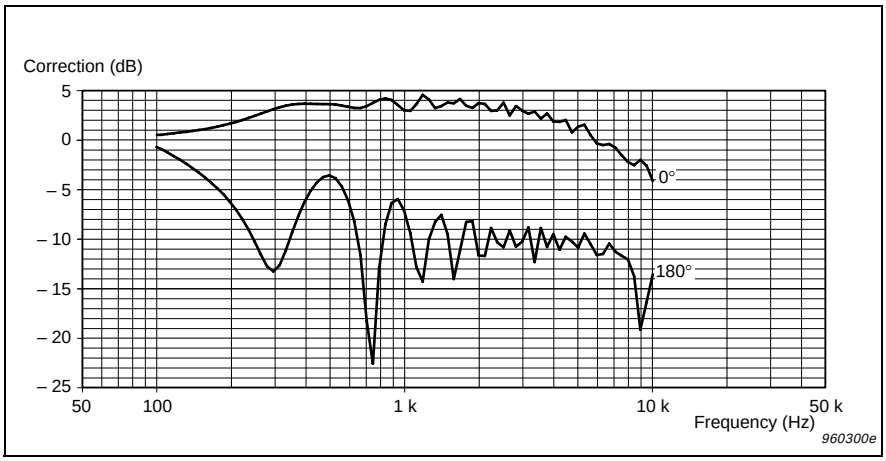


Fig. 26 Increments to frequency responses for a 1/2″ Microphone fitted with Turbulence Screen UA 0436, relative to the normal responses for the microphone

inside the Turbulence Screen (Fig. 24). The turbulence noise suppression obtained using the UA 0436 is approximately 16 dB better than that obtained with the Nose Cone UA 0386 in the frequency range 70 Hz to 1.5 kHz. Turbulence Screen UA 0436 fulfils the requirements of ISO 5136.

Fig. 26 shows the increments to the frequency responses for a 1/2″ microphone fitted with Turbulence Screen UA 0436 for 0° and 180° sound incidence. Both curves were measured in an anechoic chamber. The omnidirectivity of the Turbulence Screen is typically within ±4 dB in the frequency range 20 Hz to 1 kHz.

Fig. 27 illustrates the difference in turbulence induced noise levels for Turbulence Screen UA 0436 and Nose Cone UA 0386.

The Turbulence Screen is mounted onto the microphone and preamplifier as follows (see Fig. 24):

1. Slip the locking ring (A) and the teflon collar (B) onto the body of the preamplifier (P)
2. Screw the microphone (M) onto the preamplifier
3. Slide the microphone and preamplifier into the Turbulence Screen as far as it will go
4. Tighten the locking screw to secure the assembly.

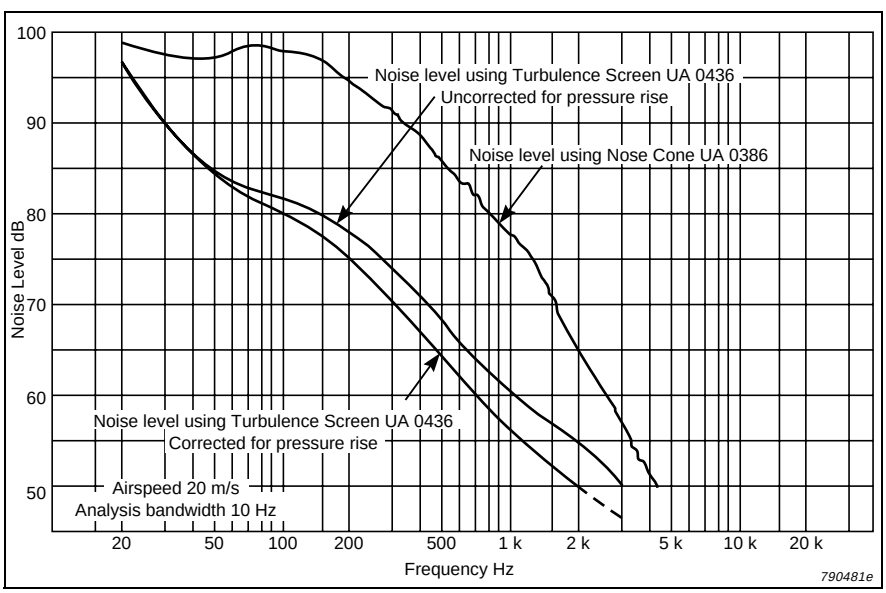


Fig. 27 Comparison of turbulence induced noise levels using Turbulence Screen UA 0436 and Nose Cone UA 0386

Preamplifier Holder UA 1317

The elegant Preamplifier Holder UA 1317 (Fig. 28) is designed for minimum disturbance of the sound field. No tools are required, the microphone and preamplifier assembly simply slides into the holder which can be locked at any angle between +90° and −90° from the vertical position. The holder can be used with a standard camera tripod and can hold all Brüel & Kjær 1/2″ preamplifiers.

Fig. 28 Preamplifier Holder UA 1317 can hold all Brüel & Kjær 1/2″ preamplifiers

Calibration Disk

Falcon™ Range Microphones Types 4189, 4190, 4191, 4192 and 4193 are supplied with a calibration disk (Fig. 19) that contains all the free-field correction curves for the associated microphone, together with free-field correction curves for the accessories in this Product Data.

The Brüel & Kjær Microphone Viewer allows you to add the data, supplied individually for each microphone, to the measured response on a PC (Fig. 20). This makes it very simple for you to obtain the exact response for any combination of accessory and sound field.

Specifications for Falcon™ Range Accessories

Windscreen UA 0237

WIND NOISE ATTENUATION: 10 to 20 dB
EXTERNAL DIAMETER: 90 mm (3.54″)
FOR USE WITH:
1/2″ microphones (with protection grid)
MATERIAL: Open-pored polyurethane foam
WEIGHT: 14 g (0.5 oz)
UA 0254: Package of six UA 0237

Windscreen UA 0459

WIND NOISE ATTENUATION: 10 to 20 dB
EXTERNAL DIAMETER: 65 mm (2.56″)
FOR USE WITH:
1/2″ microphones (with protection grid)
MATERIAL: Open-pored polyurethane foam
WEIGHT: 5 g (0.2 oz)
UA 0469: Package of six UA 0459

Nose Cone UA 0386

EXTERNAL DIAMETER: 13.2 mm (0.52″)
FOR USE WITH:
1/2″ microphones (replaces protection grid)
TEMPERATURE RANGE:
–25 to +70°C (–13 to +158°F)
HEIGHT: 37.6 mm (1.48″)
WEIGHT: 19 g (0.7 oz)

Rain Cover UA 0393

FREQUENCY RESPONSE:
(correction to 0° free-field response for the microphone with protection grid and UA 0308)
Type 4188:
6.3 kHz: –1 dB
8 kHz: –2 dB
10 kHz: –3 dB
Type 4189/90:
10 kHz: –1 dB
12.5 kHz: –2 dB
16 kHz: –3 dB
Type 4191/92:
6.3 kHz: –1 dB
22.5 kHz: –2 dB
ACTUATOR:
Equivalent Sound Pressure Level:
80 to 90 dB when applying 215 VAC to the actuator terminal (can be adjusted to 90 dB ±1 dB in conjunction with a specific microphone)
FOR USE WITH:
1/2″ microphones (replaces protection grid)
TEMPERATURE RANGE:
–25 to +150°C (–13 to +302°F)
EXTERNAL DIAMETER: 21.0 mm (0.83″)
HEIGHT: 31.0 mm (1.22″)
WEIGHT: 15 g (0.5 oz)

Turbulence Screen UA 0436

TURBULENCE NOISE SUPPRESSION:
(70 Hz to 1.5 kHz, measured in an air duct with an air velocity of 20 m/s, see Fig. 25)
16 dB better than with Nose Cone UA 0386
FREQUENCY RESPONSE (20 Hz to 5 kHz):
+5 dB (for incidence along axis)
OMNIDIRECTIVITY (20 Hz to 1 kHz):
±4 dB (measured in an anechoic chamber)
FOR USE WITH:
1/2″ microphones (with protection grid)
MAX. DIAMETER: 21 mm (0.8″)
LENGTH: 540 mm (21.3″)
WEIGHT: 200 g (7.1 oz)

Windscreen UA 0570

WIND NOISE ATTENUATION:
>15 dB (for wind speed up to 120 km/hour, in combination with a 1/2″ microphone and preamplifer, UA 0308 and UA 0393)
FREQUENCY RESPONSE:
(correction to 0° free-field response for the microphone with protection grid, UA 0308 and UA 0393)
Type 4188:
6.3 kHz: –1 dB
8 kHz: –2 dB
10 kHz: –3 dB
Type 4189/90:
8 kHz: –1 dB
10 kHz: –2 dB
12.5 kHz: –3 dB
Type 4191/92:
22.5 kHz: –1 dB
MATERIAL:
Windscreen: Open-pored polyurethane foam
Spikes: Stainless steel
HEIGHT: 233 mm (9.17″)
EXTERNAL DIAMETER: 68 mm (2.67″)
WEIGHT: 70 g (2.5 oz)

Preamplifier Holder UA 1317

FOR USE WITH:
1/2″ microphones and preamplifiers
STEM LENGTH: 295 mm (11.6″)
WEIGHT: 64 g (2.3 oz)

Note: All values are typical at 23°C (73.4°F)

The three year guarantee that covers all Falcon™ Range microphones does not include the Falcon™ Range accessories in this PD.

Brüel&Kjær reserves the right to change specifications and accessories without notice

Brüel & Kjær

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