GRAS 67TS-1-CL

Turbulence Screen Kit with Flush-mount Microphone

Turb. att.: Up to 25 dB*
Turb. speed: Up to Mach 0.2
Turb. suppr. freq. range: 500 Hz - 10 kHz*
Acoustic att.: Less than 3 dB
Directivity: ± 60 Deg
Freq. range (acoustic) 100 Hz - 70 kHz
Dyn.range 44 dB(A) - 166 dB *Depending on flow-speed

The GRAS 67TS-1-CL Turbulence Screen Kit is designed for aeroacoustic testing in solid-walled wind tunnels. The hydrodynamic component of turbulence is attenuated up to 25 dB. Thereby the acoustic signals of interest can be identified and diagnosed with a reliable resolution.

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Introduction

The GRAS 67TS-1-CL Turbulence Screen Kit is designed for aeroacoustic testing in solid-walled wind tunnels. By attenuating the hydrodynamic component of turbulence up to as much as 25 dB, the acoustic signals of interest can be identified and diagnosed with a much more reliable resolution. The flush-mount turbulence screen integrates the flush-mount and recessed mounting techniques with a special wire mesh into a single unit, and allows for adaptation of several mounting options.

The included GRAS 47BX-CL 1/4" CCP Flush-mount Microphone Set can be attached to the assembly either with a “rubber band” (O-ring) or a holder plate of POM-material. The parts necessary for both methods are included. The microphone set has an integrated, customized length cable terminated with a Microdot connector. An adapter to BNC is included. When ordering, please specify the required length in cm.

As “default” the complete assembly will fit in a flat wall with 4 mm thickness. A hole with diameter 44 mm must be provided. It is possible to attach the assembly using glue. For mounting with screws, the 67TS is provided with 4 unthreaded holes with diameter 3.1 mm. You are always welcome to contact GRAS for advice or regarding customization.

As a downloadable spread-sheet, we have published the frequency/incident angle dependent correction factors and the resulting graphs. See under Downloads/Other.

Compatibility

To perform as specified the GRAS 47BX microphone set requires a constant current input module that can deliver 4 mA and 24 V unloaded CCP voltage supply. If the constant current supply is lower, the capability of driving long cables is reduced and consequently the upper frequency is reduced. If the voltage supply is lower it will influence the upper dynamic range.

The cable of the microphone set is terminated with a 10/32 UNC microdot male connector. An adapter that converts to BNC male is included. Suitable coax cables of various types and lengths are available in standard as well as customized lengths.

The 47BX is IEEE 1451.4 TEDS v. 1.0 compliant. If your measurement platform supports Transducer Electronic Data Sheets you will be able to read and write data like properties and calibration data.

System verification

For proper sensitivity calibration, we recommend using a pistonphone like GRAS 42AP Intelligent Pistonphone.

Performance and warranty

All GRAS microphone sets are made of high-quality materials that will ensure life-long stability and robustness. The microphone sets are all assembled in verified clean-room environments by skilled and dedicated operators with many years of expertise in this field. The microphone diaphragm, body, and improved protection grid are made of high-grade stainless steel, which makes the microphone resistant to physical damage, as well as corrosion caused by aggressive air or gasses. This, combined with the reinforced gold-plated microphone terminal which guarantees a highly reliable connection, enables GRAS to offer 5 years warranty against defective materials and workmanship.

Service

If you accidentally damage the diaphragm on a GRAS microphone, we can - in most cases - replace it at a very reasonable cost and with a short turn-around time. This not only protects your investment,

but also pleases your quality assurance department because you don't have to worry about new serial numbers, etc.

Calibration

Before leaving the factory, all GRAS microphone sets are calibrated as a unit in a controlled laboratory environment using traceable calibration equipment. The sets are delivered with calibration charts including sensitivity values and frequency response graphs for the complete set. You can use the sensitivity value directly in your system setup. Depending on the use, measurement environment, and internal quality control programs, we recommend recalibrating the microphone set at least every second year.

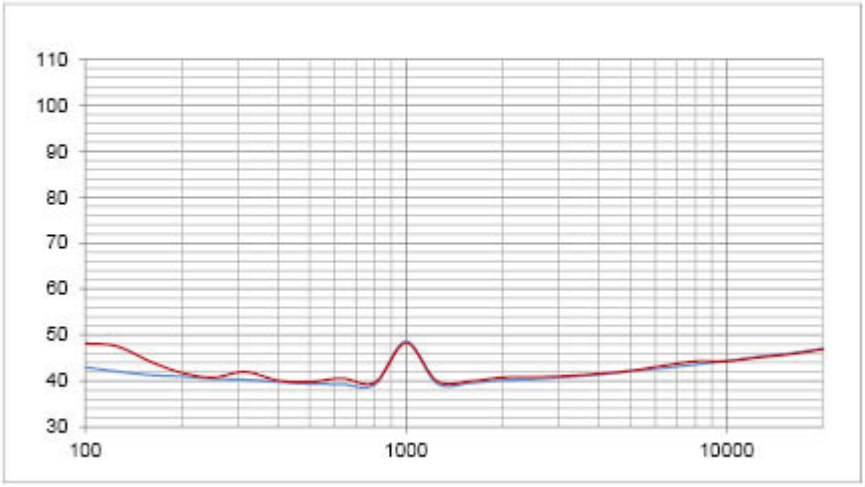
Specifications

Polarization/Connection		0 V / CCP
Dynamic range lower limit (microphone thermal noise)	dB(A)	44
Dynamic range upper limit with GRAS preamplifier	dB	166
Set sensitivity @ 250 Hz (±2 dB)	mV/Pa	1.6
Power supply (Constant Current Power)	mA	2 to 10
Microphone venting		Front
Output impedance	Ω	<50
Temperature range, operation	°C / °F	-30 to 70 / -22 to 158
Temperature range, storage	°C / °F	-40 to 85 / -40 to 185
Static pressure coefficient @250 Hz	dB/kPa	-0.008
Humidity range non condensing	% RH	0 to 100
Humidity coefficient @250 Hz	dB/% RH	<0.1
Influence of axial vibration @1 m/s²	dB re 20 µPa	66
TEDS (IEEE 1451.4)		27 v. 1.0
Connector type		Microdot 10/32
CE/RoHS compliant/WEEE registered		Yes/Yes/Yes
Weight	g / oz	40 / 1.411

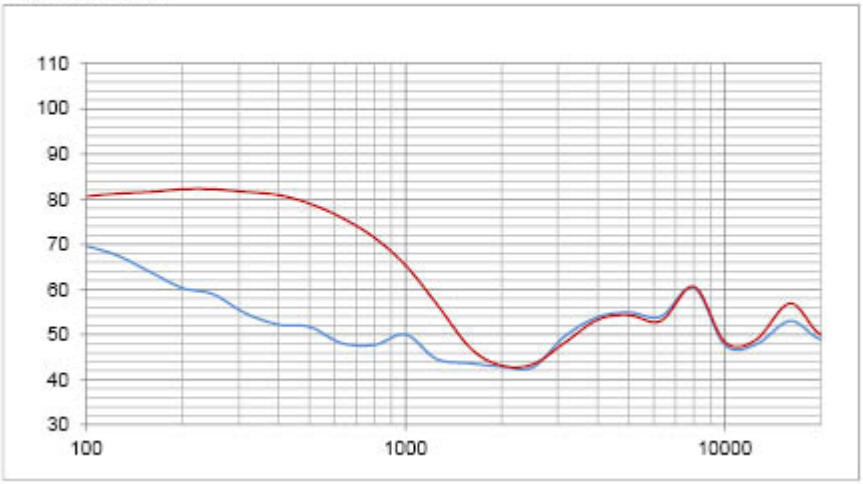
The graphs illustrate the effect of the GRAS 67TS Turbulence Screen on boundary layer turbulence measured at different laminar flow speeds. Y-axis is the turbulence level in dB SPL and the X-axis is the frequency in Hz. The red line is the result without turbulence screen, the blue line is the result with turbulence screen. The turbulence level is up to 25 dB lower with the turbulence screen (depending on the wind speed).

The measurements have been made in GRAS's wind tunnel with a GRAS 47BX-CL Flush-mount microphone.

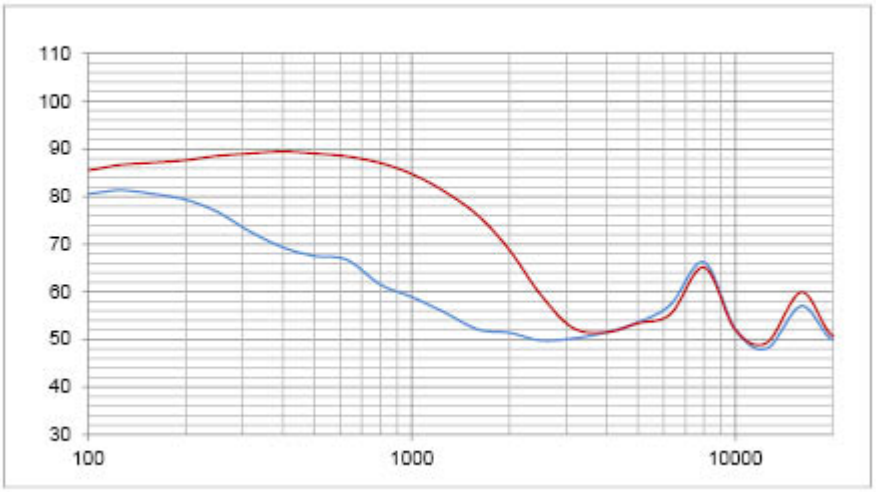
0 m/s laminar flow



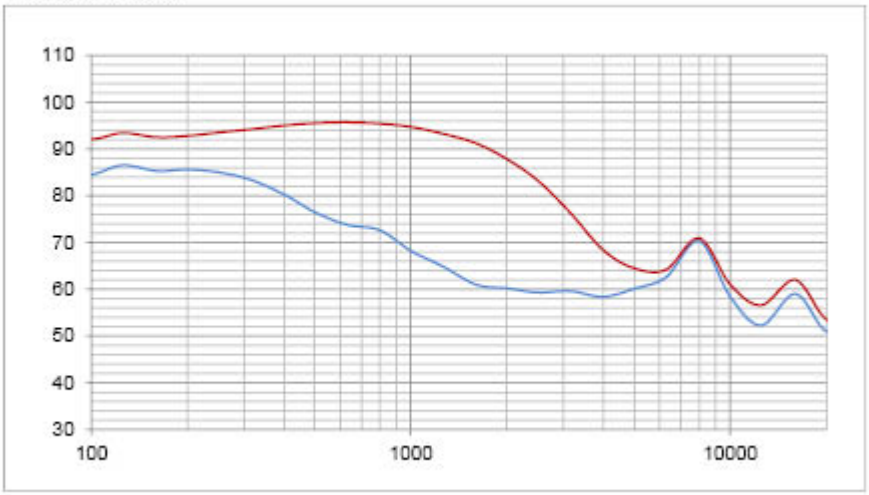
5 m/s laminar flow



10 m/s laminar flow



15 m/s laminar flow



GRAS Sound & Vibration reserves the right to change specifications and accessories without notice.

Ordering info

Included items

GRAS 47BX-CL	1/4" CCP Flush-mount Microphone Set (adapted for the turbulence screen mechanics)
-	Turbulence Screen Assembly, parts for mounting, USB flash-drive with calibration data, drawings etc.

Optional items

GRAS 12AL	1-Channel CCP Power Module with A-weighting filter
GRAS 12AQ	2-Channel Universal Power Module with signal conditioning and PC interface
GRAS 42AP	Intelligent pistonphone
GRAS OP0023	Kit for Sensitivity Calibration of Flush-mount Microphone Sets
GRAS OP0024	Kit for Frequency Calibration of Flush-mount Microphone Sets
GRAS AE0074	BNC - BNC Adapter
GRAS AA0035	3 m BNC - BNC Cable
GRAS AA0037	10 m BNC - BNC Cable

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About GRAS Sound & Vibration

GRAS is a worldwide leader in the sound and vibration industry. We develop and manufacture state-of-the-art measurement microphones to industries where acoustic measuring accuracy and repeatability is of utmost importance in R&D, QA and production. This includes applications and solutions for customers within the fields of aerospace, automotive, audiology, and consumer electronics. GRAS microphones are designed to live up to the high quality, durability and accuracy that our customers have come to expect and trust.

GRAS Sound & Vibration is represented through subsidiaries and distributors in more than 40 countries and is part of Axiometrix Solutions, a leading test solutions provider comprised of globally recognized measurement brands. Read more at www.GRASacoustics.com

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