GRAS 41AC-3

CCP Outdoor Microphone for Community & Airport Noise

Standard: IEC 61672-1
TEDS
Special features: Configurable for 90 or 0 degrees of incidence
IP55 proof

The 41AC-3 is a SysCheck2™ enabled outdoor microphone for unattended use for prolonged periods of time. It can be used for community noise applications or for monitoring of overhead aircraft noise.

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Introduction

The 41AC-3 is a small precision outdoor microphone according to IEC 61672-1 for monitoring of community noise and the noise of overhead aircraft.

Typical Applications and Use

With state-of-the-art weather protection and extensive use of high-grade stainless steel, the 41AC-3 is ideal for long-term unattended monitoring of community noise and noise from overhead aircraft.

It can easily be configured for measurement of noise with 90 degrees of incidence, typically community noise, or – with the proper correction data – for measurement of noise with 0 degrees of incidence, typically overhead aircraft. A USB flash drive with the necessary 1/12 octave correction data is part of the delivery.

Design

The 41AC-3 has been designed to meet the need for a precise and reliable outdoor microphone that can be part of a permanent installation. It is weatherproof, and easy to configure and calibrate.

It uses a 40AE-S2 1/2" Prepolarized Free-Field Microphone, High Sensitivity, and a 26CA 1/2'' CCP Preamplifier with BNC Connector.

The microphone and preamplifier are mounted inside a high-grade stainless steel housing. The top cone—also made of stainless steel—has been perfected for best acoustical response with the 40AE-S2 microphone. In addition to its acoustical function, the top cone acts as a bird spike.

The 40AE-S2 microphone has been modified for optimal response with respect to the sound field and the top cone's internal cavity. The protection grid is a special design that offers added water protection.

The windscreen eliminates the effects of airflow and also serves as part of the 41AC-3's water protection. It is glued to a detachable tube that ensures correct positioning. A locking system eliminates the risk of accidental dislocation. The 41AC-3 is waterproof and fulfills the requirements of IP-55. It is designed to withstand a wide range of weather conditions and temperatures for a very long period, i.e., easily a year or longer.

It comes with an adapter for pipe mounting. An adapter for tripod mounting is also part of the delivery.

SysCheck2 and TEDS

Verification with SysCheck2*
SysCheck2 is a GRAS-patented technology for verifying measurement chain integrity. This verification tool performs a remote health check on microphones, channel gain, and cable integrity. The verifications are made on each SysCheck2-enabled microphone connected to a CCP power module with transducer electronic data sheet (TEDS) support and measurement software with one click. SysCheck2-enabled microphones also provide on-demand environmental data (temperature, barometric pressure, and humidity). SysCheck2 functionality is particularly convenient when the microphones are placed where physical verification is a risk (for example, if the microphones are hidden in complex mechanical structures, such as couplers or specialized test boxes on production lines), the locations are difficult or dangerous to reach, or if used in a distributed measurement where there are many microphones spread out over a large area.

SysCheck2 microphones are equipped with an ultra-low power microcontroller located in the microphone preamplifier. This microcontroller is able to produce

a reference signal that can be compared to a reference measurement to determine the measurement chain status. Changes in microphone or cable capacitance, channel gain, or the unexpected use of a filter will result in a measurement deviation and will be reflected in a change in the output from the measurement channel. Once detected, the problem can be examined and then rectified.

In the evaluation of measurement-chain health, SysCheck2 can detect microphone sensitivity or channel gain changes. Additionally, the microphone acquires data on local environmental conditions, including temperature, pressure, and humidity. This data can help with the traceability of acquired data and help refine testing to reduce the number of erroneous pass-fail results on a production line.

Full SysCheck2 functionality is ready for use out of the box when connected to compatible setups, such as APx 500 Measurement Software with GRAS 12BA, 12BB, or 12BE power modules and an Audio Precision APx series analyzer or with an Audio Precision APx series analyzer with CCP and TEDS read/write capability.

However, all features are accessible with a suitable CCP-based power module, analyzer, and data acquisition system after setup with the GRAS-supplied software development kit (SDK) or our SDK and an application programming interface (API), depending on your system.

System verification with TEDS
TEDS is very useful to determine which microphone is connected to which input channel and contains relevant information needed by SysCheck2 and other tools used for measurement setup and verification. However, it is not by itself a check of whether the microphone is within specifications or not.

Compatibility

The 41AC-3 uses a prepolarized microphone and a standard CCP preamplifier that requires a BNC to BNC cable and an input module compatible with this technology.

Calibration

Before leaving the factory, all GRAS products are calibrated in a controlled laboratory environment using traceable calibration equipment.
An individual test certificate stating the sensitivity and frequency response is included with each product.

Performance and Warranty

GRAS outdoor microphones are made of components from our proven standard portfolio and are all manufactured of high-quality material and branded parts that were chosen and processed to ensure life-long stability and robustness.

All parts are manufactured and assembled at the factory in Denmark by skilled and dedicated operators in a verified clean-room environment. The microphone diaphragm, body and unique protection grid are made of high-grade stainless steel and make the microphone set resistant to physical damage as well as corrosion caused by aggressive air or gasses.

This, together with the enforced gold-plated microphone terminal which guarantees a highly reliable connection, enables us to offer 5 years warranty against defective materials and workmanship. The windscreen comes with a 6-month warranty.

The warranty does not cover products that are damaged due to negligent use, an incorrect power supply, or an incorrect connection to the equipment.

Service and Repairs

All repairs are made at GRAS International Support Center located in Denmark. Our Support Center is equipped with the newest test equipment and staffed with dedicated and highly skilled engineers. Upon request, we make cost estimates based on fixed repair categories.

If a product covered by warranty is sent for service, it is repaired free of charge, unless the damage is the result of negligent use or other violations of the warranty. All repairs are delivered with a service report, as well as an updated calibration chart.

Specifications

Polarization/Connection		0 V / CCP
Frequency range (±1 dB)	Hz	5 to 10 k
Frequency range (±2 dB)	Hz	3.15 to 20 k
Dynamic range lower limit (microphone thermal noise)	dB(A)	17
Dynamic range upper limit	dB	138
Set sensitivity @ 250 Hz (±3 dB)	mV/Pa	50
Power supply (Constant Current Power)	mA	2 - 20*
IEC 61094-4 Compliance		WS3P
Temperature range, operation	°C / °F	-30 to 70 / -22 to 158<-sup>†‡</sup>
Temperature range, storage	°C / °F	-40 to 85 / -40 to 185
Temperature coefficient @250 Hz	dB/°C / dB/°F	-0.01 / -0.006
Static pressure coefficient @250 Hz	dB/kPa	-0.014
Humidity range non condensing	% RH	0 to 95
Influence of axial vibration @1 m/s²	dB re 20 µPa	62
TEDS (IEEE 1451.4)		27 v. 1.0
Connector type		BNC
CE/RoHS compliant/WEEE registered		Yes/Yes/Yes
Weight	g / oz	1250 / 44.092
SysCheck2 resolution**	dB	0.3

* At temperatures below –10°C / 14°F use at least 4 mA for full functionality of SysCheck2.
† If used at temperatures higher than 70°C / 158°F, use high-temperature cables.
‡ SysCheck2 functional temperature range is between –20°C / -4°F and 65°C / 149°F.
** Requires an ambient noise level less than 65 dBSPL.

Environmental sensor data accuracy (operational from -40 to 85°C / -40 to 185°F)‡‡

Temperature	±2°C / 3.6°F	from 0 to 65°C / 32 to 149°F
Pressure, static	±1.5 hPa	from 0 to 65°C / 32 to 149°F and 300 to 1100 hPa

Relative humidity	±4%	from 0 to 65°C / 32 to 149°F

‡‡ This temperature range is solely for the functionality of the environmental data acquisition. This table provides the temperature ranges where the stated accuracy is guaranteed. For example, if the SysCheck2-stated temperature falls below the microphones operational temperature limit, it may not have the stated accuracy, but should still be confirmed.

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

Dimensions

When mounted on a pipe: 343 mm/13.5 in above the top of the pipe.

Ordering info

Included items

GRAS 40AE-S2	1/2" Prepolarized Free-field Microphone, High Sensitivity
GRAS 26CA	1/2'' CCP Standard Preamplifier with BNC Connector and O-ring OR2038
SW0005	USB flash drive containing correction data (resolution: 1/12 octave)
AM0378	Wind Screen
RA0286	1" Pole Mount Adapter
GR1096	Tripod Adapter
SK0017	Tripod Thread Adapter

Optional items

AA0035	3 m BNC - BNC Cable
AA0037	10 m BNC - BNC Cable
AA0038	30 m BNC - BNC Cable
GRAS 12AL	1-Channel Power Module
GRAS 42AP	Intelligent Pistonphone, Class 0

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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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