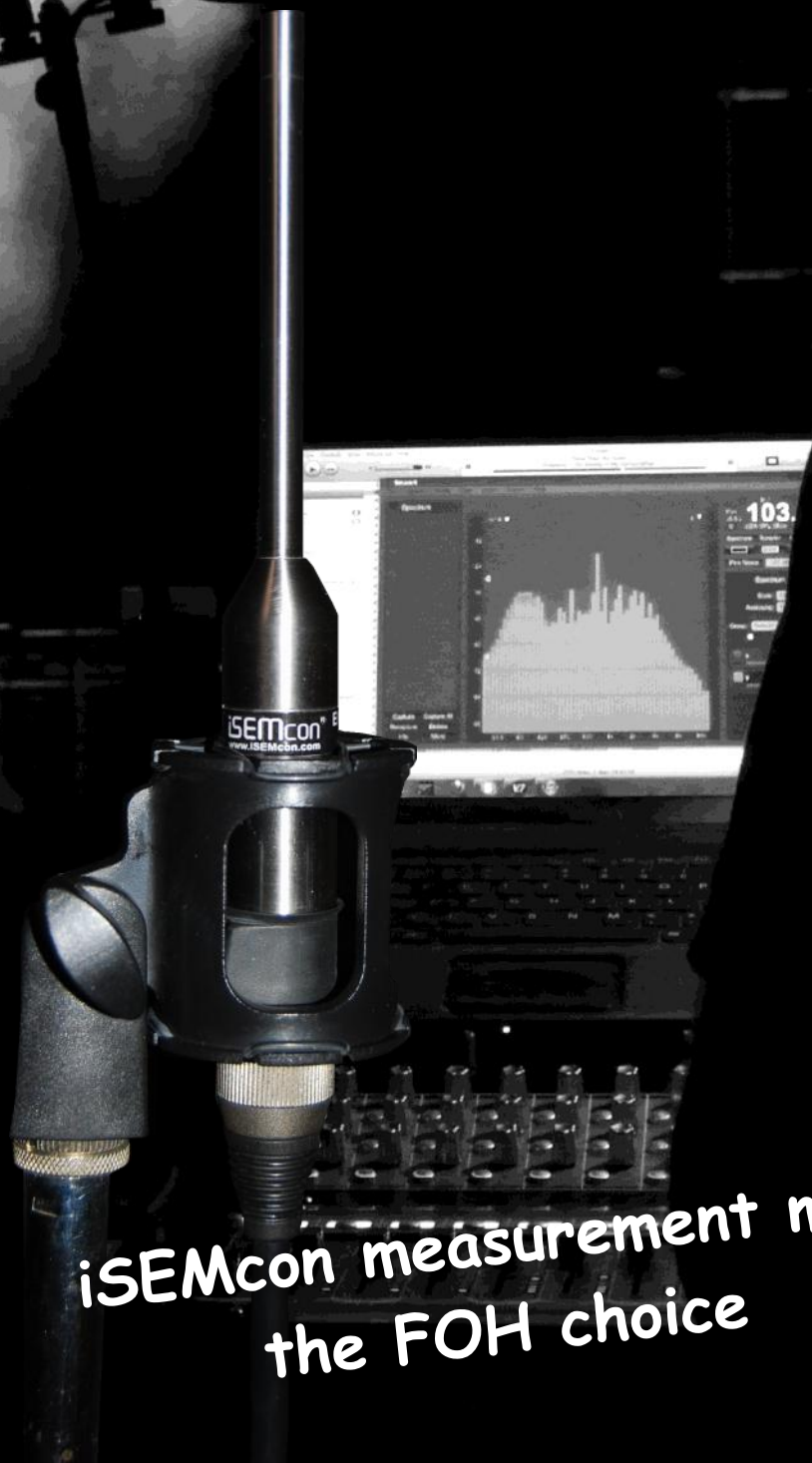




Acoustic Measurement Products

02-2017



*iSEMcon measurement mics
the FOH choice*

About - iSEMcon is a privately owned company, located in both Viernheim, Germany and Northwest, Ohio. Partners Wolfgang Frank and Win Otto are co-workers in the sensor business with over **twenty (20) years of experience**.

Wolfgang Frank has an additional **fourteen (14)** years of experience in **measurement microphone** design and manufacturing. He also founded IBF-Akustik e.K. in 1997.

IBF-Akustik e.K. became iSEMcon GmbH in April 2010.

ACOUSTIC MEASUREMENT PRODUCTS

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iSEMcon offers a variety of new acoustic measurement microphones and associated products on a budget. The newly developed constant current powered microphones (CCP) are well known in the market and compatible with equipment from other manufacturers.

Other proprietary names*1 for the same interface are ICP®, IEPE®, Deltatron®, AcoTron®, Isotron®, Piezotron® and more.

See product overview for reference.

CCP powered microphones transform the high impedance microphone output into a low impedance voltage signal (less than 10 Ohms) and are capable to drive long cables.

A big plus under today's EMI (Electromagnetic Interference) requirements. All our microphones are fully ESD protected. The EMM-07/13D080-CCP also available with Phantom power option (EMM-07/13D080-P48) has High Energy Surge protection built-in.

Acoustic measurement products. Sound level and sound quality analysis on a budget.

- Sound power testing
- Noise and vibration analysis
- Home theater treatment

iSEMcon microphones vs our competitor.

- Competitive pricing
- Superior performance
 - improved linearity
 - greater stability



IEC61672 class 1 frequency response

Our microphones are known to have an IEC61672 class 1 frequency response or being close to the class 1 limits. This should not be misunderstood. The entire microphone while built from electret condenser capsules using a metalized polypropylene diaphragm is not class 1. Many competitive products even sold for USD 1000 are using such prepolarized mylar diaphragm microphone cartridges.

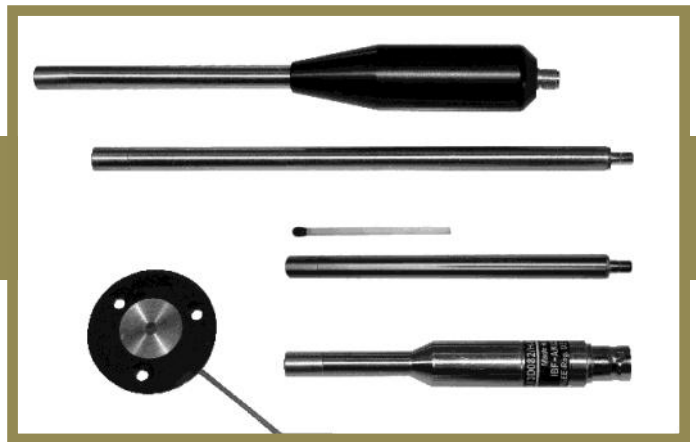
Summarized: IEC 61672 class 1 addresses also the temperature and pressure behavior and is not only limited to "domestic" conditions and frequency response linearity.

- ✓ Frequency range **10...20000Hz**
- ✓ Sensitivity **30mV/Pa** typ.
- ✓ Dynamic range **30... >130dBspl**
- ✓ **3%** distortion limit **>130dBspl** typ.
- ✓ Built-in **TEDS** (template 27)
- ✓ **Freefield & Diffusefield**
Calibration chart and data included on CD
- ✓ **SMB** connector
- ✓ **CCP or Phantom Power**
- ✓ Dimensions: diameter **1/4"** (7mm)
length w/ connector **4"** (101mm)
- ✓ Weight **0.3oz** (9grams)



iSEMcon offers a large variety of acoustic measurement products such as electret and traditional prepolarized condenser microphones together with adapters, cables and signal conditioning equipment.

IEPE constant current powered MICROPHONES



(* ICP™, IEPE, DeltaTron™, CCP, ISOTRON™ compatible)

EMM-13D082 series



(* ICP™, IEPE, DeltaTron™, CCP, ISOTRON™ compatible)

1/4"- 1/2" body, BNC receptable.

- long cable drive capability
- integral preamp
- small and rugged
- **large dynamic range**
- **stainless steel housing**
- **individual calibration chart**

For more technical data see EMM-7101 series microphone. Differs only in size and connector.

Ordering information : EMM-13D082-series

Order No.	Name	Sensitivity, typ. mV @ 94dBspl	Signal polarity	Max. SPL, 3% distortion limit
130021	EMM-13D082/H-CCP/C-T	6	Non-inverting	140 (145)
130020	EMM-13D082/S-CCP/C-T	30	inverting	125 (130)

SPECIFICATIONS EMM-13D082/#-CCP/#-T

Values for: 4mA CCP; 21V excitation voltage; 23°Celsius

PERFORMANCE

Frequency Response characteristic	Free-Field
Polarization Voltage	Prepolarized
Nominal Sensitivity @1kHz	See order info
Microphone Polarity	See order info
Frequency Response calibrated	10...20.000 Hz
Frequency Response ± 1dB	50...8000 Hz
± 2dB	20...12000 Hz
± 3dB	10...18000 Hz
Phase Match 100-5000 Hz	± 5°
Inherent Noise 100-10000 Hz	<30dB typ.
Inherent Noise 1/3 Oct.	<15dB typ.
Dynamic Range (3% distortion) typ.	See order info

ELECTRICAL

Constant Current Power	2...20 mA
Constant Current Power nominal	4 mA
Excitation Voltage	18...30V
Output Bias Voltage	7 ± 2 V
Output Impedance	<10 Ω
Phantom Power (requires XLRmale to BNC connector adapter),	12...52Vdc

ENVIRONMENTAL

Operating Temperature	-10...+55°
Storage Temperature	-20...+70°
Operating Humidity Range	0...90%r.H.
Axial Vibration Sensitivity	~ 50dB

PHYSICAL

Housing Material	Stainless Steel
Sealing	Polyurethane/Epoxy
Output Connector	SMB coaxial socket
Dimensions	Ø 1/4" (7mm) x 3 1/4" (82mm)
Weight	1,1 oz (35g)

CONFORMITY

IEC 61000-6-1

SPECIAL FUNCTIONALITY

TEDS (IEEE 1451.4)	Template 27 prog.
ESD protection	30kV

EMM-7101 series

(* ICP™, IEPE, DeltaTron™, CCP, ISOTRON™ compati-



TYPICAL APPLICATIONS

Multi-channel measurements
Single-channel measurements
Sound-power and sound-field analysis
Low-cost in-car measurements
Industrial Acoustics

The iSEMcon® Array Microphone EMM-7101-CSTB is an economically priced prepolarized microphone for single and multi channel measurements in arrays and matrices. It is a full featured product with integrated CCP-Preamplifier and programmed TEDS-chip (Template 27). The long 4" body minimizes the sound field influence from holding clamp or array mechanics.

works from
Constant Current Power (CCP)
Phantom Power (PH)
By the use of an connector adapter
(no signal converter necessary)

FEATURES CSTB-Version

Frequency range **10...20000Hz**
Sensitivity **30mV/Pa** typ.
Signal polarity: positive
Dynamic range 30... >125dBspl
3% distortion limit **>130dBspl** typ.
Built-in **TEDS** (template 27)
on CD
Excellent amplitude and phase matching
SMB connector
CCP or Phantom Power
Dimensions: diameter **¼"** (7mm)
length w/ connector **4"** (101mm)
Weight **0.3oz** (9grams)

DIFFERENCE CHTB Version

Sensitivity **6mV/Pa** typ.
Signal polarity: positive
Dynamic range 30... >140dBspl
3% distortion limit **>145dBspl** typ.

SPECIFICATIONS

Values for: 4mA CCP; 21V excitation voltage; 23° Celsius

PERFORMANCE

Frequency Response characteristic	Free-Field
Polarization Voltage	Prepolarized
Nominal Sensitivity @1kHz	See order info
Microphone Polarity	See order info
Frequency Response calibrated	10...20.000 Hz
Frequency Response ± 1dB	50...8000 Hz
± 2dB	20...12000 Hz
± 3dB	10...18000 Hz
Phase Match 100-5000 Hz	± 5°
Inherent Noise 100-10000 Hz	<30dB typ.
Inherent Noise 1/3 Oct.	<15dB typ.
Dynamic Range (3% distortion) typ.	See order info

ENVIRONMENTAL

Operating Temperature range	-10...+55°
Storage Temperature	-20...+70°
Operating Humidity Range	0...90%r.H.
Axial Vibration Sensitivity	~ 50dB

PHYSICAL

Housing Material	Stainless Steel
Sealing	Polyurethane/Epoxy
Output Connector	SMB coaxial socket
Dimensions	Ø ¼"(7mm) x 4"(101mm)
Weight	0.3 oz (9g)

CONFORMITY

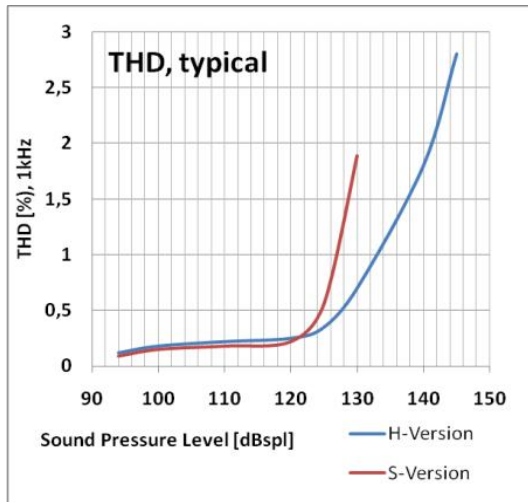
IEC 61000-6-1

ELECTRICAL

Constant Current Power	2...20 mA
Constant Current Power nominal	4 mA
Excitation Voltage	18...30V
Output Bias Voltage	7 ± 2 V
Output Impedance	<10 Ω
Phantom Power (requires XLRmale to BNC connector adapter)	12...52Vdc

SPECIAL FUNCTIONALITY

TEDS (IEEE 1451.4)	Template 27 prog.
ESD protection	30kV



The iSEMcon® EMM-7101-C#T# series consists of a special ICP and Phantom Power compatible circuitry. The built-in prepolarized microphone cartridge controls an AC/DC-Zener Diode circuitry with an output impedance as low as 10 Ohms (as per circuitry simulation). This is very unique and new in the market and makes the microphone compatible to Constant Current power (ICP) as well as Phantom Power without loss in functionality and signal quality and almost independent from source impedance.

It also has a TEDS EEPROM built-in being fully compatible with the IEEE1451.4 standard.

Data as per IEEE 1451.4

TEDS IC:DS2431 Serial:0000028DFD06

Basic TEDS

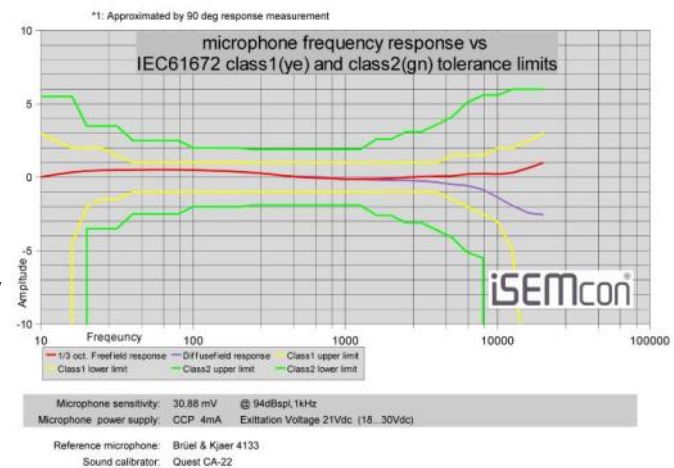
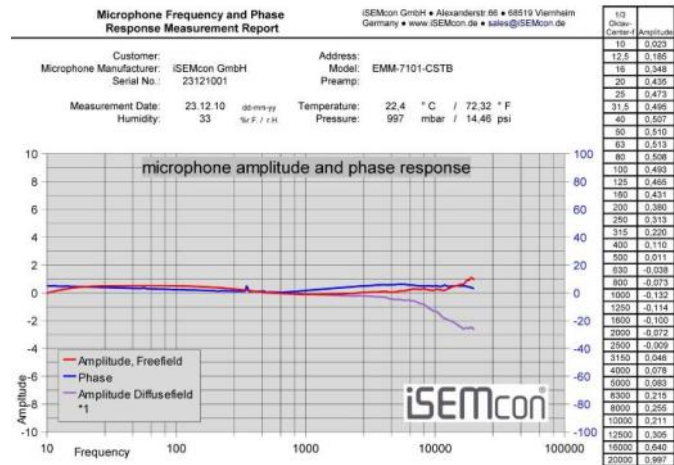
Check Sum:C9 Version letter:@
 Manu ID: Version number:1
 Model No: 30010 Serial number: 121001

Standard Template TEDS

Selector:0 Polarity :positive
 Template:27 Mapping :0
 Sel Case:0 Sig Type :0
 Sens :30,9 AC/DC :1
 Ref Freq:989 Cal Date :23.12.2010
 Polar :Prepolarized Cal init :FRA
 Sel Case:0 Cal period:0
 Mic Type:Free Loc ID :0
 Mic Size:1/4" Selector :3
 Volume :0 End Select:0
 Sel Case:0

The microphone powers from Constant Current Power (ICP™, IEPE, DeltaTron™, CCP, ISOTRON™, AcoTron™ compatible *1) or from Phantom Power (12..52Vdc) by the use of an XLR to BNC connector adapter or XLR to SMB

cable. The microphone does not require an electronic signal converter. There are no limitations in functionality or loss in signal quality



while being powered from Phantom Power. Microphone sensitivity is almost independent from power source (less than 1 dBmV)

Power Source	18V	21V	30V	
ICP 2mA	30,18mV	30,22mV	30,31mV	
ICP 4mA	30,37mV	30,46mV	30,52mV	
ICP 10mA	30,64mV	30,78mV	30,82mV	
Phantom 48V / 6,8kΩ				30,60mV
Phantom 24V / 2,4kΩ				30,49mV
Phantom 12V / 2,4kΩ				29,93mV

Note: While applying phantom power the TEDS functionality is not available.

Ordering information : EMM-7101-series

Order No.	Name	Sensitivity, typ. mV @ 94dBspl	Max. SPL, 3% distortion limit	Signal polarity	Connector
130014	EMM-7101/S-CCP/A-T	30	125 (130)	Non inverting	SMA
130015	EMM-7101/H-CCP/A-T	6	140 (145)	inverting	SMA

PHANTOM POWERED MICROPHONES



EMM-13D082 PHANTOM series

1/4" front - 1/2" body Measurement microphone, phantom powered

- super compact design
- Mini XLR connector
- Human readable Calibration files included (ASCII data/ Text file)
- Printed frequency response data
- on-axis and diffuse-field calibration data included at no additional cost

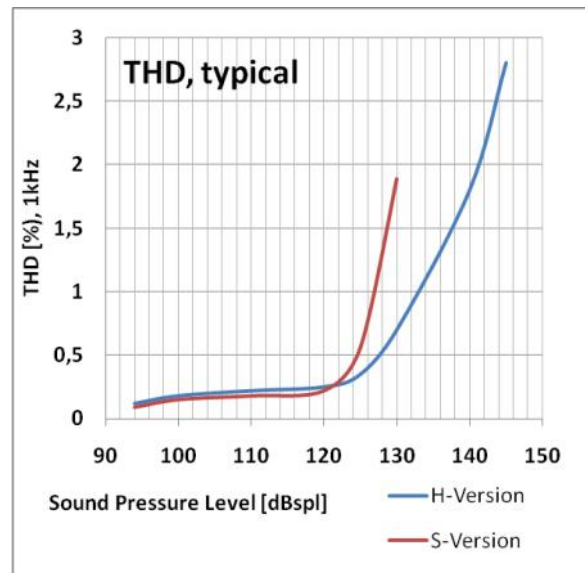
Features:

- Phantom power 12 / 24 / 48Volts
 - Linear frequency response
 - 10...20000 Hz (calibration chart)
 - Omnidirectional
- Large Dynamic Range
 - Stainless steel housing
 - Polyurethane and calibration file included)sealed
 - ESD and Surge-Voltage Protection

Included Accessories:
5m MiniXLR to XLR Cable



3% distortion vs Sound Pressure Level



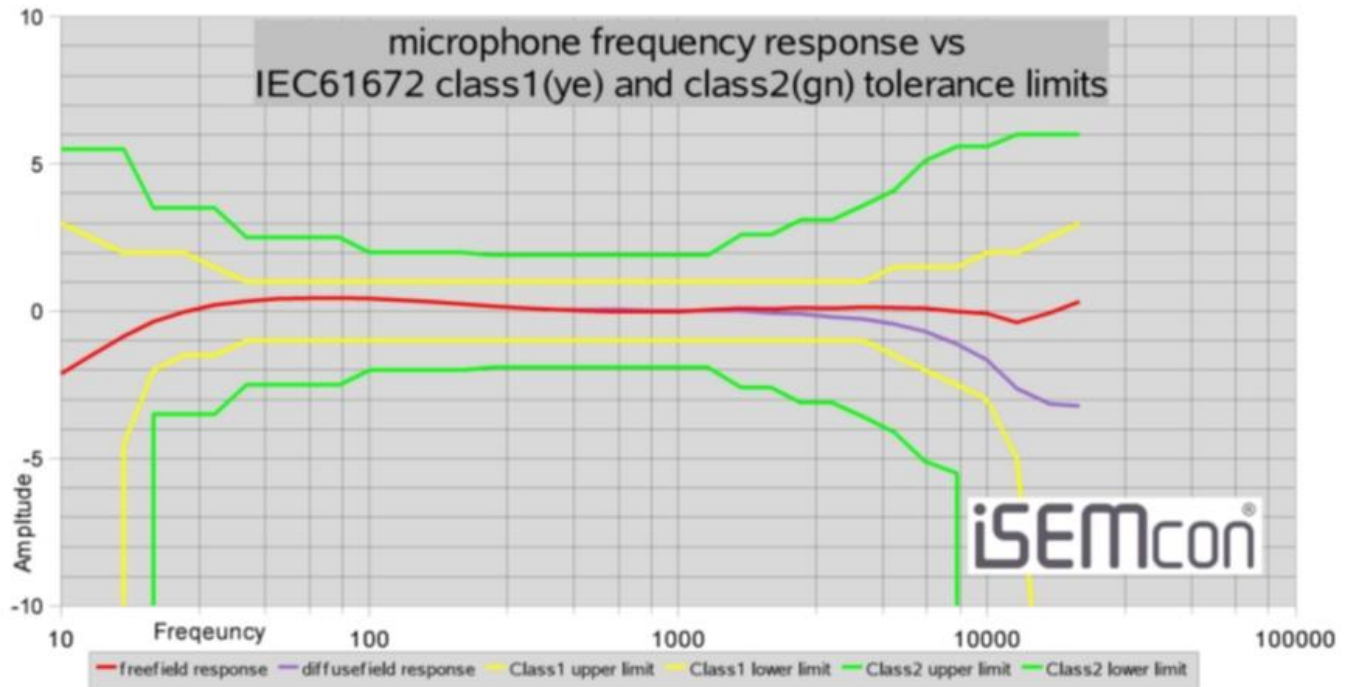
Data file format stored in #####.cal

Human readable ASCII file:

www.iSEMcon.com freefield
Sensitivity 30,88 mV/Pa @1kHz

10,00	-0,02
10,40	0,03
10,82	0,06
11,26	0,10
11,71	0,14
12,18	0,17
.....	
.....	0,94
19945,31	0,94
19968,75	0,93
19992,19	0,93

^ frequency (Hz) ^amplitude response (dB)



Excerpt from cal-sheet.

Microphone sensitivity:	P48: 6,37	P24: 6,13	P12: 5,90	mV @ 94dBspl,1kHz
Microphone power supply:	Phantom 12V / 24V / 48V			

Ordering information : EMM-13D082-series

Order No.	Name	Sensitivity, typ. mV @ 94dBspl	Signal polarity	Max. SPL, 3% distortion limit
140011	EMM-13D082/H-P48/RM	6	Non-inverting	140 (145)
140010	EMM-13D082/S-P48/RM	30	inverting	125 (130)

SPECIFICATIONS EMM-13D082/#-P48/RM

Values for: 24V Phantom Power; 23°Celsius

PERFORMANCE

Frequency Response characteristic	Free-Field
Polarization Voltage	Prepolarized
Nominal Sensitivity @1kHz	See order info
Microphone Polarity	See order info
Frequency Response calibrated	10...20.000 Hz
Frequency Response ± 1dB	50...8000 Hz
± 2dB	20...12000 Hz
± 3dB	10...18000 Hz
Phase Match 100-5000 Hz	± 5°
Inherent Noise 100-10000 Hz	<30dB typ.
Inherent Noise 1/3 Oct.	<15dB typ.
Dynamic Range (3% distortion) typ.	See order info

ENVIRONMENTAL

Operating Temperature range	-10...+55°
Storage Temperature	-20...+70°
Operating Humidity Range	0...90%r.H.
Axial Vibration Sensitivity	~ 50dB

PHYSICAL

Housing Material	Stainless Steel
Sealing	Polyurethane/Epoxy
Output Connector	SMB coaxial socket
Dimensions	Ø ¼" (7mm) x 3 ¼" (82mm)
Weight	0.8 oz (25g)

CONFORMITY

IEC 61000-6-1

ELECTRICAL

Output Impedance	<100 Ω
Phantom Power (requires XLRmale to BNC connector adapter)	12...52Vdc

SPECIAL FUNCTIONALITY

ESD and Surge Voltage protection

TYPICAL APPLICATIONS

Sound-power and sound-field analysis
 Industrial Acoustics
 Room acoustics analysis
 Sound reinforcement
 Real time analyzers

The EMX-7150 is a 1/4" microphone made from stainless steel and using state of the art water tight Neutrik³ connectors has a very accurate frequency response combined with the capability to measure high sound pressure levels up to 145dBspl. It is low impedance measurement microphone that can be operated from 12...52 V Phantom Power which is available on most professional microphone preamplifiers and professional computer interfaces. With its mechanically robust design it is well suited for harsh environment use such as open air sound reinforcement measurements. Its class 1 frequency response (*NOTE: NOT A CLASS 1 MICROPHONE*)*1 makes it predestined for Room acoustics analysis including recording studios and home theaters. It can normally be used without the included freefield calibration data file for compensation. In this case take the individual calibration data as proof of its superb performance.

Our super protection windshield SWS -7 is recommended for open air use when limited amounts of spraying water as well as trickling water impact the microphone.

FEATURES

Frequency range **10Hz...20kHz**
 Sensitivity **6mV/Pa** typ.
 Dynamic range ~30... >140dBspl
 3% distortion limits **146dBspl** typ.
Calibration chart and calibration data files included on CD
IEC 61672 class 1 frequency response
 Dimensions: acoustic port dia. 1/4" (**7mm**)
 Microphone body **0.75"** (19mm)
 Overall length **6"** (**152mm**)
 Weight **0.3oz** (**75 grams**)

ACTUAL SIZE

Small windshield included →

High SPL capability
 freefield calibration data
 diffusefield calibration data^{*2} →

1/4" acoustical port →

Long microphone body
 reduces early reflection effects →

All stainless steel body →

Factory replaceable electronics & capsule →

O-Ring seal →

Water tight connection
 when using Neutrik³ NC-3FX-HD connector →



*1: Class 1 Freq.Response under limited conditions (23°C ± 3°C, 1013 mbar ± 30mbar)

*2: approximated by 90deg incidence response

*3: The corporate names and names of the products stated in this brochure are trademarks or registered trademarks of the respective companies.

SPECIFICATIONS

Values for 23° Celsius and 48V Phantom Power

PERFORMANCE

Frequency Response characteristic
 Polarization Voltage
 Nominal Sensitivity @1kHz
 Microphone Polarity
 Frequency Response calibrated
 Frequency Response IEC61672 *1
 Inherent Noise 100-10000 Hz
 Inherent Noise 1/3 Oct.
 Max. SPL. (3% distortion limit)
 Max. SPL. (3% distortion) typ.

Free-Field
 Prepolarized
 6mV/Pa
 Non-Inverting
 10...20.000 Hz class 1
 <30dB typ.
 <15dB typ.
 > 140dBspl
 146 dBspl

ELECTRICAL

Output Impedance < 200 Ω
 Phantom Power 12...52Vdc

PHYSICAL

Housing Material Stainless Steel
 Sealing O-ring/Polyurethane/Epoxy
 Output Connector XLR male
 Dimensions Ø ¼“(7mm) x 6“(152mm)
 Weight 0.3 oz (75g)

ENVIRONMENTAL

Operating Temperature range -10...+55°
 Storage Temperature Range -20...+70°
 Operating Humidity Range 0...90%r.H.
 Axial Vibration Sensitivity ~ 50dB

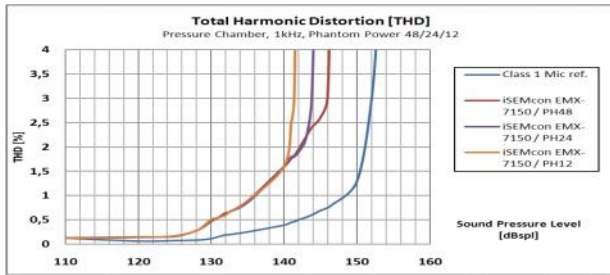
CONFORMITY

IEC 61000-6-1;
 IEC 61010-1

SPECIAL FUNCTIONALITY

Voltage surge protection ü

THD , ref 1kHz

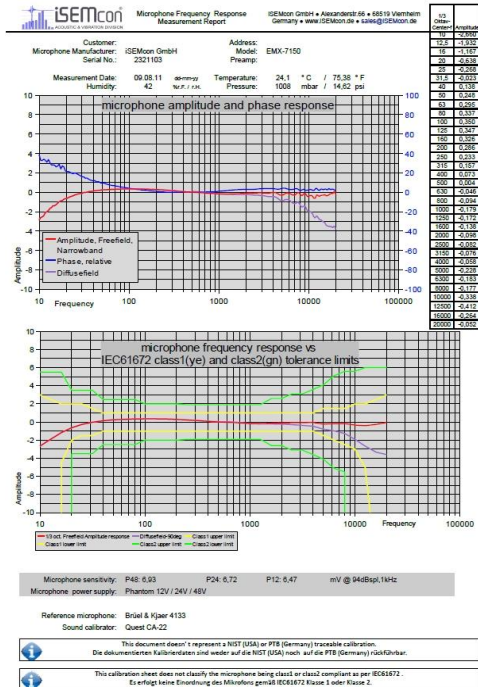


CALIBRATION DATA FILE ORMAT

Human readable ASCII file:
www.iSEMcon.com freefield
 Sensitivity 5.88 mV/Pa @1kHz
 10.00 -0.02
 11.26 0.10

 19992.19 0.93
 ^ frequency (Hz) ^amplitude response (dB)

FREQUENCY RESPONSE



Ordering information :

Order No.	Name	
800060	EMX-7150-CF1	EMX-7150, clamp,USB Stick,cal Adapter
800070	EMX-7150-CF2	2x EMX-7150, shock-mount,USB Stick,cal Adapter
800080	EMX-7150-CF/MP	2x EMX-7150, clamps,USB Stick,cal Adapter
800081	EMX-7150-CF/MT	3x EMX-7150, clamps,USB Stick,cal Adapter
800082	EMX-7150-CF/MQ	4x EMX-7150, clamps,USB Stick,cal Adapter
150010	EMX-7150	EMX-7150, clamp,

SUPPLIED ACCESSORIES



Small windshield



Universal holding clamp

OPTIONAL ACCESSORIES



SWS-7 windshield

Metal grid guard covered from impregnated foam. Protects microphone port from spraying water. Slide on retainer with O-ring prevents from trickle water



MB-230-BOX

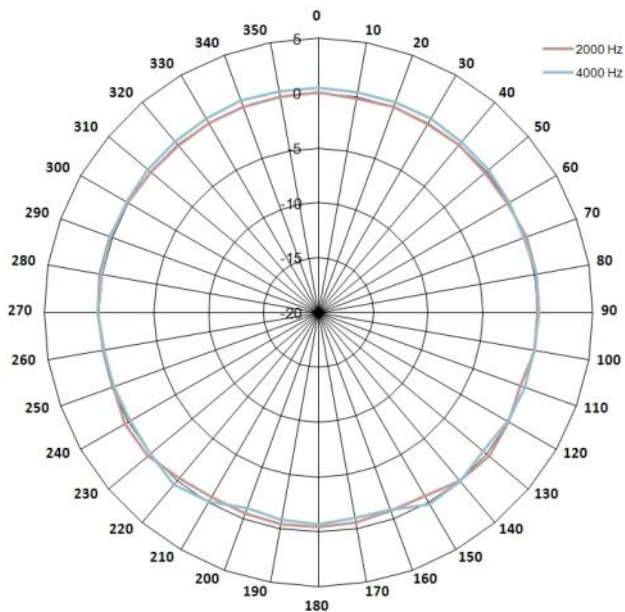
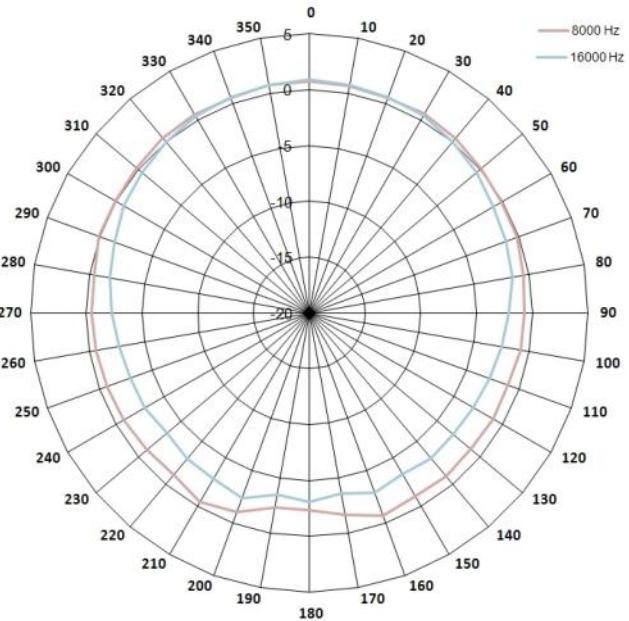
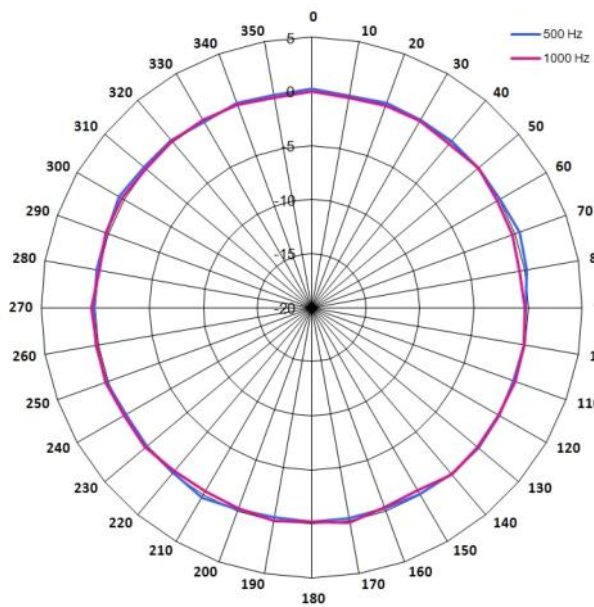
O-Ring seal
Water protection
Dust protection
Dimensions [mm]
210 x 167 x 90



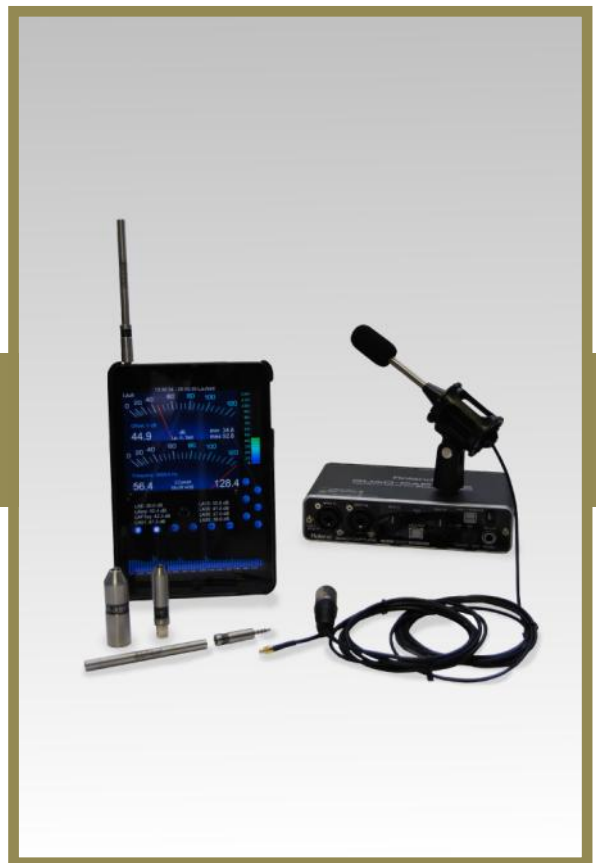
SOUND CALIBRA-

TOR SC-1 94dBspl and 110dBspl switchable. Standard and custom size adapters. Calibration data included (includes individual pressure chart)

POLAR PATTERNS, typical



iSEMic microphones



AT A GLANCE

The 1/4" iSEMic Microphone and Accessories Series is supply and signal voltage compatibility to iPhone*1, iPad*1 as well as other mobile devices including laptop computers and Phantom Powered Pro Audio Equipment. The superb functionality is provided by the space saving microphone built-in electronics.

The advantages of the new iSEMic microphone series are obvious. Mobile devices like iPad's and iPhone's are more and more used for controlling live sound mixers and PA Systems giving the FOH and system engineers the possibility of walking the venue while optimizing for sound and acoustics using special apps on mobile devices. Back at the FOH place the same microphone can be used to service the PC or MAC computer by the use of an off-the-shelf USB interface and XLR cable.

With its mechanically robust design it is well suited for harsh environment use such as open air sound reinforcement measurements.

Its class 2 frequency response makes it predestined for room acoustics analysis including recording studios and home theaters. It can normally be used without the included freefield calibration data file for compensation. In this case take the individual calibration data as proof of its superb performance.

MULTI STANDARD MICROPHONE

- **Excitation voltage 2.5V to 52Vdc**, current limited
- Powers from: **iPhone, iPad, other mobile devices, laptop computers, Phantom Power, ICP/IEPE power.**
- **Microphone sensitivity typ -52dB re 1V/pa** (2,5mV @ 94dBspl)
- Sensitivity optimized for **mobile devices** (e.g. iPad) **not to clip.**
- Frequency range **20Hz...>20kHz**
- **Temperature compensated** for accurate **SPL monitoring.**
- **IEC 61672 class 2** frequency response **Standard (125dBspl)**
- **Surge voltage protection**
- **Calibration** chart and freefield- & diffusefield calibration data files download ready.
- **Stainless steel** body, **Gold plated** connectors
- Microphone body dia. **1/4" (7 mm)**
- Microphone length **3,7" (94 mm)**

TYPICAL APPLICATIONS

- Sound-power and sound-field analysis
- Industrial Acoustics
- Room acoustics analysis
- Sound reinforcement
- Real time analyzers
- SPL monitoring (TEMPERATURE COMPENSATED electronics and capsule)

iSEMic 725TR BASE KIT



725TR base kit includes

- **Individually calibrated iSEMic 725TR** (free and diffusefield data)
- **SA-iBF adapter** for iPad/iPhone use
- **Windscreen**

packed in tin metal case as shown

**1 The corporate names and names of the products stated in this brochure are trademarks or registered trademarks of the respective companies.*

CONTACT

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Germany
Fon +49 6204 911 24 91
Fax +49 6204 911 24 90
www.iSEMcon.com

PERFORMANCE

Frequency Response characteristic	Free-Field
Polarization Voltage	Prepolarized
Nominal Sensitivity @1kHz	3mV/Pa
Sensitivity temperature drift	See diagram
Microphone Polarity	Non-Inverting
Frequency Response calibrated	10...20.000 Hz
Frequency Response IEC61672 *1	class 2
Inherent Noise100-10000 Hz	<30dB typ.
Inherent Noise 1/3 Oct.	<15dB typ.
Max. SPL. (3% distortion limit)	> 125dBspl
Max. SPL. (3% distortion) typ.	= 127 dBspl

ELECTRICAL

Output Impedance	< 200 Ω
Supply voltage	2.5...52Vdc

PHYSICAL

Housing Material	Stainless Steel
Sealing	O-ring/Polyurethane/Epoxy
Output Connector	SMB male
Dimensions	Ø ¼"(7mm) x 3.7"(94 mm)
Weight	0.3 oz (10g)

CONFORMITY

IEC 61000-6-1;

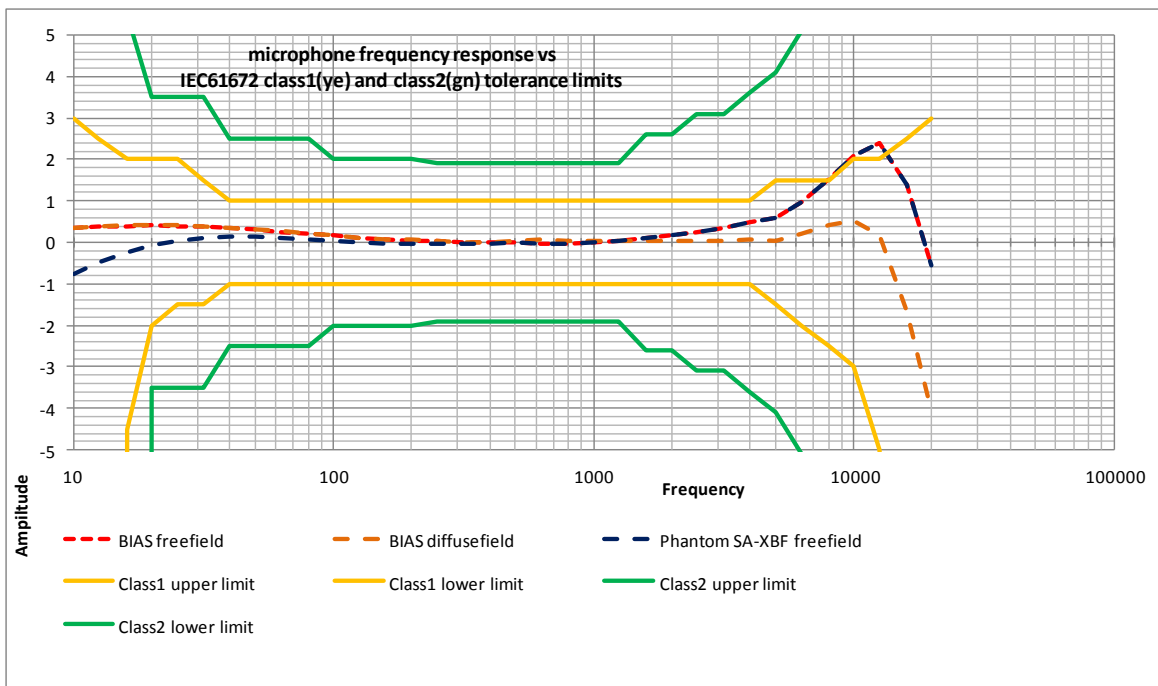
ENVIRONMENTAL

Operating Temperature range	-10...+55°
Storage Temperature Range	-20...+90°
Operating Humidity Range	0...90%.H.
Axial Vibration Sensitivity	~ 50dB

SPECIAL FUNCTIONALITY

Voltage surge protection	✓
EMC noise filter	✓

FREQUENCY RESPONSE



The diagram above shows the typical frequency response of an iSEMic 725TR microphone. Please note, that each microphone comes individually calibrated for free-field and diffusefield.

There is only a minor change in microphone sensitivity while being powered from Bias power (e.g. 2.7V 2.2k—iPad) or regular Phantom power (48V 6.8k).

Please note, that the use of the SA-XBF results in an about 1dB roll-off at 10Hz due to adapter internal coupling capacitors.

CALIBRATION DATA FILE FORMAT

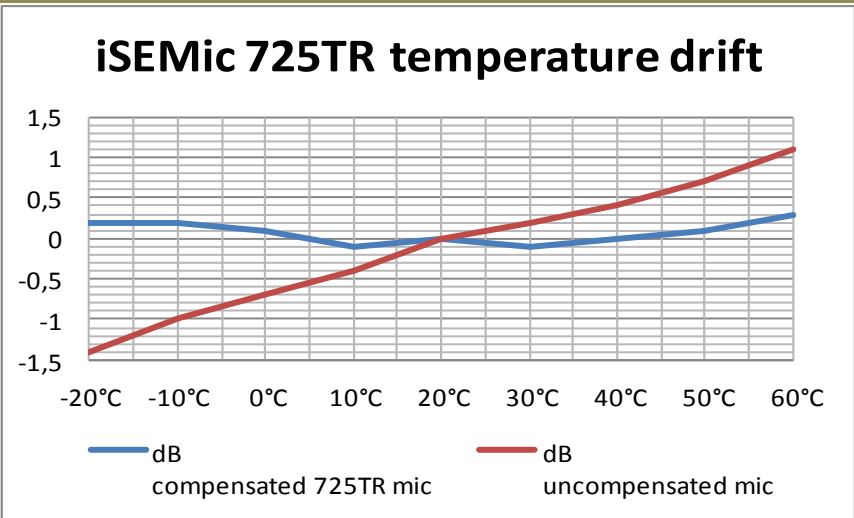
Human readable ASCII file: 1/6 octave

```

;www.iSEMcon.com freefield
;Sensitivity 2.40 mV/Pa @1kHz
10.00 -0.02
11.26 0.10
.....
19992.19 0.93
^ frequency (Hz) ^amplitude response (dB)
    
```

TEMPERATURE STABILITY

The temperature characteristics of the sensitivity of an electret condenser microphone depends on the electrical characteristics of the microphone capsule built-in impedance converter and signal conversion circuitry as well as the acousto-mechanical characteristics of the diaphragm equivalent stiffness. iSEMcon is one of the first microphone manufacturers disclosing the secret about the temperature behavior of electrets based measurement microphones.



The range for the measurement was set at -20°C to 60°C which is more than iSEMcon microphones are normally used at. The most important temperatures are 10 °C up to about 50°C which covers indoor as well as open air use. It will give you a good predictable performance whether it is used in a cold autumn night or if the hot summer sun “burns” microphone body.

The table above shows the microphone sensitivity change at 1kHz. The microphone capsule itself is the part being responsible for most of the temperature change. The iSEMic electronics compensates for both the electronics itself as well as the microphone capsule.

Ref. 1kHz	dB		
	compensated 725TR mic	uncompensated mic capsule	
Temp	-20°C	0,2	-1,4
	-10°C	0,2	-1
	0°C	0,1	-0,7
	10°C	-0,1	-0,4
	20°C	0	0
	30°C	-0,1	0,2
	40°C	0	0,4
	50°C	0,1	0,7
	60°C	0,3	1,1

(see also: *Temperature characteristics of electret condenser microphones Acoust. Sci. & Tech. 27, 4 (2006).*)

Ordering information:

Order No.	Name
480002	iSEMic 725TR base kit-2 including SA-XBF Phantom power Adapter,
480001	iSEMic 725TR base kit, 725TR microphone, SA-iBF adapter for iPhone/iPad, windscreen, brochure, individual calibration data (freefield&diffusefield) download from my.isemic.com at no cost, metal box.
400001	iSEMic 725TR, microphone bulk, without
460001	SA-iBF adapter (iPhone, iPad, others) CTIA/AHJ compliant
460002	SA-SBF adapter (others) OMTP compliant
460003	SA-XBF adapter, impedance symmetrical power and signal adapter. Current limiting.
460004	SA-CBF adapter, BNC to SMB adapter
460010	SA-BFM500 extension rod
470012	CX-P48/BF 5m, asymmetrical—hot input used. Cold shortened to gnd
470022	CX-BFBM 2m SMX extensions cable
470032	CX-TRSBF 2m 3.5mm stereo plug to SMB (laptop computer)
470041	CX-TA4FBF-1m, TA4F 4pol mini XLR to SMB cable
470042	CX-TA\$FBF-2m, TA4F 4 pol mini XLR to SMB cable
220023	MH-07D/iSEMic-CA Microphone bushing
240030	WS-7XL windscreen
230300	CA-1/4/2 : 1/4" to 1/2" insertion adapter for 1/2" calibrators

iSEMcon offers a large variety of accessories for the iSEMic series microphone such as cables, adapters and holders.

Please visit our shop pages for further information or contact your local dealer or sales rep.



The bushing can be used together with the holding clamp or shockmount to attach the microphone to a regular microphone desk or floor stand. It is best not to clamp the microphone body but the SMB connector to avoid scratches or deformations on the microphone body. Attach the extension cable to the microphone and insert the microphone into the clamp. Use the Allen-key to fasten the screw slightly.



iSEMcon offers both an impedance symmetric Phantom Power adapter containing a special circuitry to match the iSEMic microphone to Phantom Power devices. The advantage of the full featured adapter is, that the mic draws power from the hot and the cold XLR input which makes it impedance symmetrical. The electronics also limits the power draw from both, the hot and the cold input (2mA each).



While using the full featured adapter there is an about 1dB frequency roll-off at 10Hz.



iSEMic 725TR with SA-XBF adapter in holding clamp.

CX-P48/BF cable use



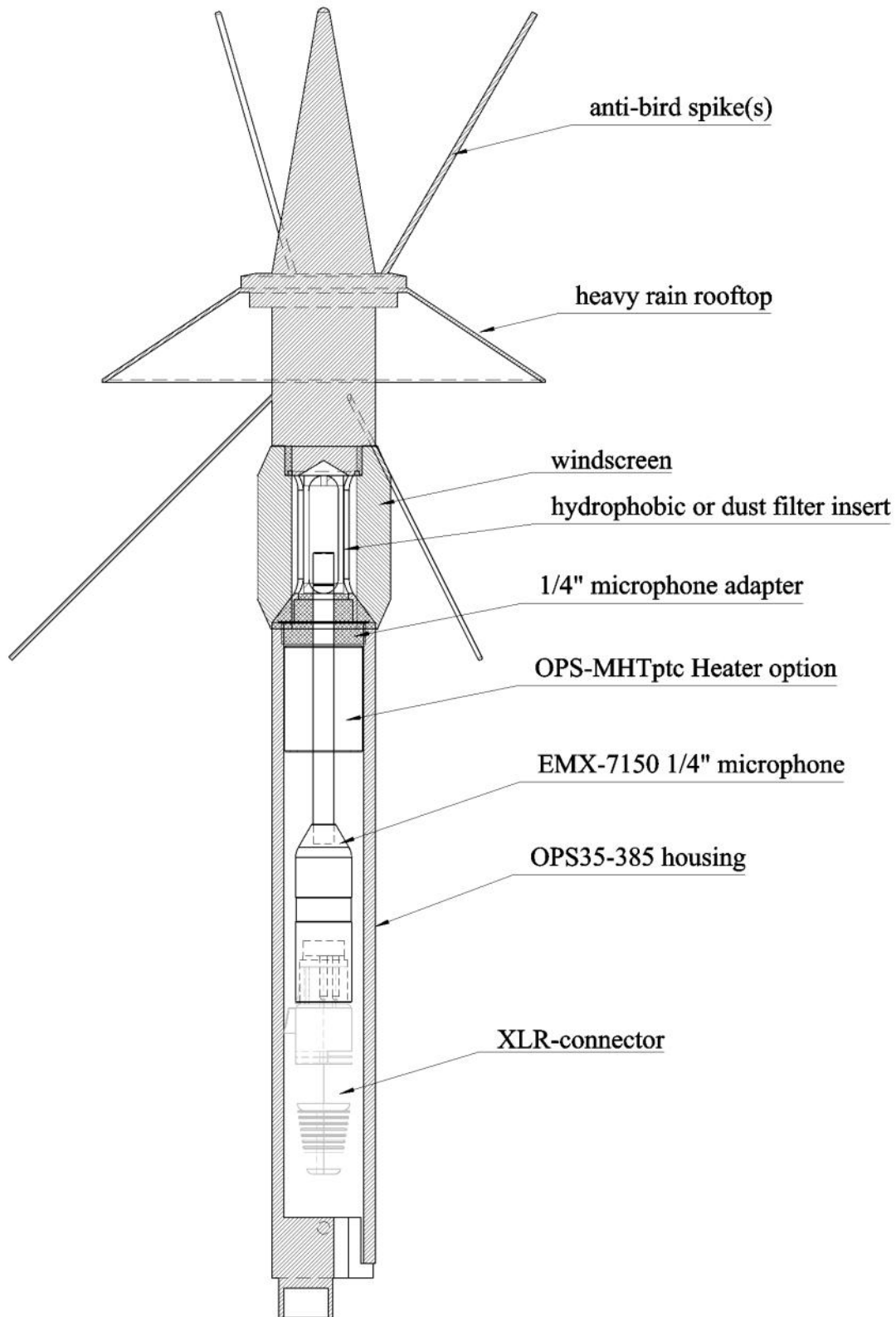
The microphone can also be used with a cost effective passive cable to be powered from Phantom Power. This is an asymmetrical solution and should be used for short distances only. The power draw is not limited by the cable but Phantom Power Circuitry (resistors) only (preamp or computer interface). The cold XLR input is shorted to ground.

DO NOT !!!



The iSEMic microphone should not be plugged or unplugged into a mixer console or PA system unless the input channel is muted. If the system does not have a muting option the volume should be turned off. This avoids loud popping noise that can cause damage in speakers and/or affect your hearing.

OPS-35 full featured



OPS-35 KITS & OPTIONS



OPS35-285/385 Base kit



- Wind noise reduction
- Calibration file available for download (page 21)
- Optional microphone heater
- Optional dust & hydrophobic filters

PHYSICAL	
Name	Description
Diameter	35mm (1,38 in) - Body
	50mm (2 in) - Windscreen
Height	285mm—OPS35-285
	385mm—OPS35-385
Weight	170g (6 oz) —OPS35-285
	220g (7,8 oz) —OPS35-385
Mounting	3/8—16 & 5/8- 27 Tripod
Material	Polyoxymethylene (POM)
Protection	IP54 vertical , semi permanent use

The OPS 35 system is designed to be used with a large variety of microphones in the nominal mic diameter range of 1/4" to 1/2" as well as different mic lengths.

It is available in two standard lengths; 285 mm for use with iSEMcon's EMM-7101 or 385 mm for use with iSEMcon's EMX-7150 among other 3rd party microphones.

Not the right length? The housing length can be lengthened by adding one or more extensions.

FEATURES

- Adaptive design for 1/4" and 1/2" microphones other diameters upon request.
- All modular length
- Microphone protection in any weather
- Build-in rain and drip gap
- Optional roof top
- Flexible mounting options from standard tripod connector
- Removable top for microphone calibration
- Durable microphone holding system

Ordering information :

Order No.	Name
500000	OPS35-385
500001	OPS35-285

Please note: one standard microphone adapter is included at no additional cost. Selection can be made during ordering process. Custom size adapters will require a surcharge.

OPS-35 ROOF TOP

The OPS-RT150 is the ideal option when heavy rain is likely. The idea is to prevent the foam windscreen from getting saturated.

A soaked windscreen has a different frequency response behavior compared to a dry one. iSEMcon wants measurement results as accurate as possible even under heavy rain conditions.

The Roof Top comes with anti-bird spikes packaged separately but not inserted. These can be installed by the customer if needed.

Roof top Diameter 150 mm



The fabric used is water tight but acoustically transparent as far as possible (not rubber coated). The fibers become water tight upon getting wet (ref. tent cloth). It can be removed for cleaning, replacement and/or impregnation.



Ordering information :

Order No.	Name
500060	OPS35-MHT ptc-1/4
500061	OPS35-MHT-imp 1/2
500062	OPS35-MHT-iec 1/2
500040	OPS35-RT150

OPS35 Heater



The OPS35 heater is an easy to use as well as economical way to protect a microphone diaphragm from condensing water. Condensation changes frequency response behavior while adding weight to the microphone diaphragm. The use of a chemical type dehumidifier is limited in time of use. Such a dehumidifier requires monitoring as well as drying if saturated from humidity.

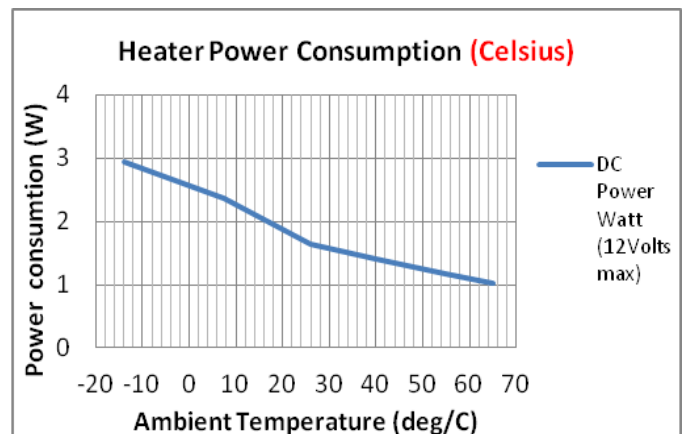
The heater is 100% reliable and is maintenance free.

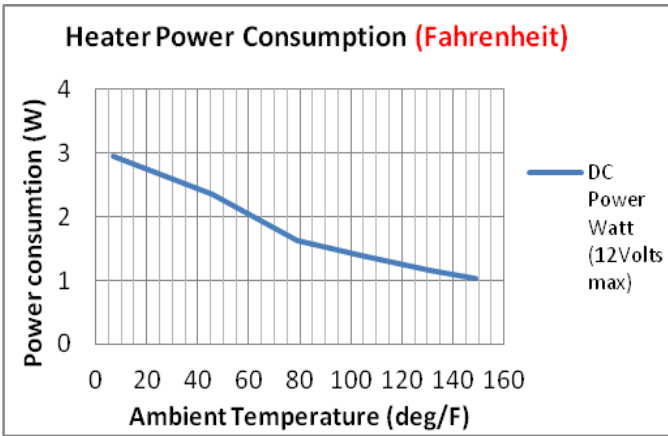
The OPS heater uses a special heater element which is fail safe. The colder it is, the more heat the OPS35-MHTptc adds. It will not add heat at high temperatures and overheating is not possible.

The following graphs show you the heater performance characteristics. Temperatures have been measured at the mic capsule position (acoustical port) of an installed microphone (1/4" type).

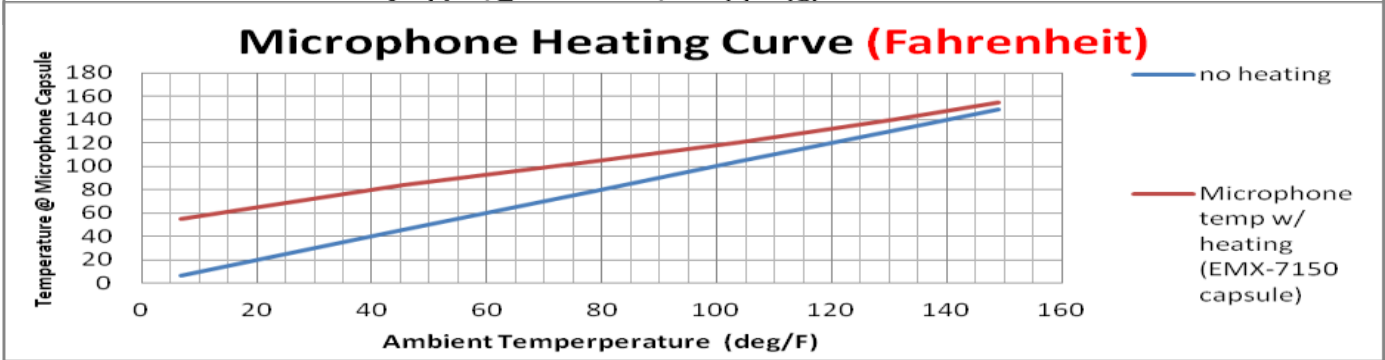
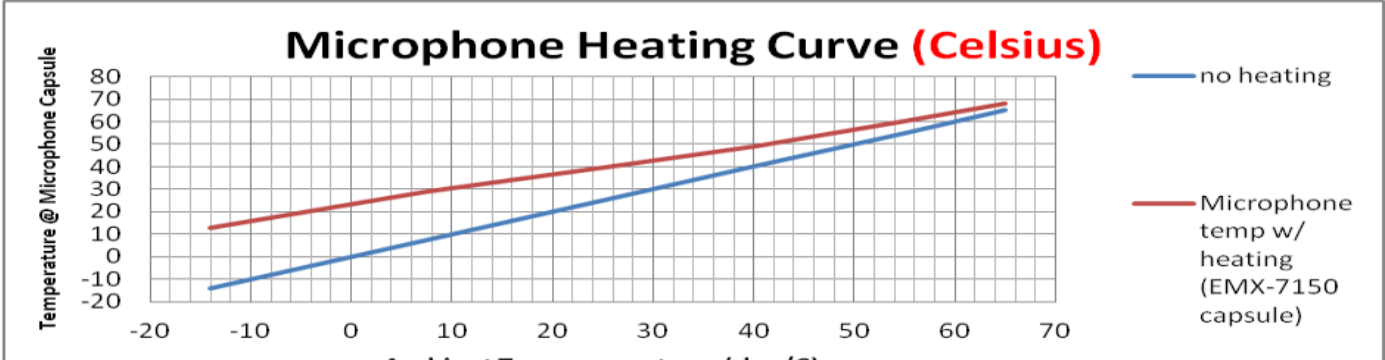
For comparison the "no heating" graph has been added as well. It shows the mic capsule temperature following the ambient temperature 1:1.

The red graph shows the mic capsule temp with the heater installed and powered from 12Vdc. **Do not** power from 12Vac due to possible crosstalk (hum) with microphone installed or microphone cable used.





Data	
Name	Description
Power consumption	12Vdc, 3 Watts max (250 mA) self regulated PTC heater.
Connection	Open cable ends, 30cm leads
Diameter	26.5 mm (1,08 in)
Height	36 mm (1.42 in)
Weight	40 g (1, oz)
Mounting	M4 Screw clamp. Metal screw with Nylon insert.
Material	Polyoxymethylene (POM) , Aluminum



OPS-35 FILTER

OPS filters are being used to improve and to add additional protection when required. This is a dust filter as well as combo filter hydrophobic (water repellent). The hydrophobic filter is recommended for rain (light, heavy or extended periods).

The filters will be inserted in the acoustic coupler.

Features:

- Diameter 0,55" (14mm)
- Length 1,6" (40mm)
- Color: transparent
- Material: PVC/ woven Nylon (Dust filter)
- Material: PVC/ woven PolypropyleneTeflon (Hydrophobic Filter)
- Temperature: -20 to +65°C (-4 to +149°F)



Ordering information :

Order No.	Name
500055	OPS35-FLTdwr-1/4

Note: dwr – durable water repellent

The OPS35-100 Extension can be used to extend the OPS35 housing in 100mm increments.

OPS35-100 Extension



Ordering information :

Order No.	Name
500010	OPS35-100

OPS35-ADxx Microphone Adapters

A unique feature of the OPS microphone protection system is the range of measurement microphones that can be installed. It does not matter if it is an iSEMcon EMM-7101 mic, EMX-7150 mic or a third party microphone having an acoustic frontend in the range 1/4" to 1/2" (7 mm...13.2 mm). Installation is easy when using the right size microphone adapter and adjustment tool.

The OPS35 can deal with multiple microphone sizes and provide maximum protection. The OPS-35 kit comes with one adapter included. Other sizes of adapters are available for purchase.



Ordering information :

Order No.	Name
500011	OPS35-AD1/4
500012	OPS35-AD1/2-IMP (12,7mm)
500013	OPS35-AD1/2-IEC (13,2mm)
500019	OPS35-ADcust

Note: ADCust – please contact iSEMcon before ordering (sales@isemcon.com)

OPS-35 Service Kits & Replacement parts

There are a few parts that probably will need to be replaced or serviced over time.

These parts could be O-rings, windscreens and the Roof Top cover.



Ordering information :

Order No.	Name
500020	OPS35-WS-01 (windscreen)
500031	OPS35-SKit1 (O-rings)
500032	OPS35-SKit2 (screw & keys assortment)

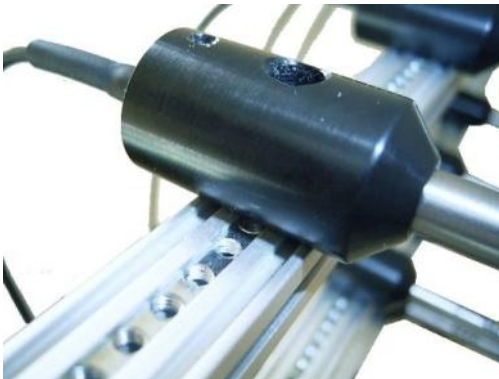
MICROPHONE ARRAY



MICROPHONE ARRAY



- **flexible** - built from extruded aluminum profile using pre-threaded mounting rails (1/5" spacing) or single locking nuts.



- **light weight** - 4x4 array total weight 2 lbs. (0,9 kg) includes microphones, add 0.5 oz (16grams) for additional microphone and clamp, add 8 oz (100grams) for additional horizontal rail to e.g. build a 5x5 array.



- **easy to reconfigure** for custom microphone to microphone spacing.



- **economically priced** 4x4 array, includes array microphones, standard cables, frame and mechanics.
- **runs out of the box** - includes all necessary tools for configuration and mounting.

Total weight 4x4 array as shown including cable weight: 3.5 lbs (1,5 kg).

Ordering information : REQUEST A QUOTE

**SOUND LEVEL
CALIBRATORS**



SOUND CALIBRATORS

SOUND CALIBRATOR SC-1

- 9V battery powered
- 94dBspl 110dBspl switchable
- 1/4" or 1/2" or individual adapters
- stainless steel body



General description

The SC-1 sound calibrator is a one frequency dual amplitude, self contained field calibrator that quickly and also precisely verifies the accuracy and the sensitivity of microphones. The unit generates a 1kHz reference tone at 94 and 110 dB SPL. The calibrator uses a single 9 Volt battery.

The SC-1 consists of a amplitude switchable constant frequency oscillator, a transducer and a microphone coupler. The coupler accepts a large variety of microphones. Separate 1/2", 1/4" and 8mm adapters are available (others upon request).

Regulation of the SPL-output is inherently provided against battery drain.

Specifications

- output frequency 1kHz \pm 0.2%
- output amplitude switchable 94dB / 110dB
- accuracy \pm 0.5dB @ 20°C [68°F] and 1013mbar [760mm Hg]
- Operating Temperature -5°C to 55°C [40°F to 130°F]

- Temperature drift Coefficient of SPL is -0.08 to -0.012 dB/K
- Humidity 5 to 95% relative humidity
- Power supply: 9V standard transistor battery (Low Batt control)
- Construction Solid state integrated circuitry in stainless steel/plastic housing
- Size: dia 40mm [1.57"], x 132mm [5.24"]

Theory of operation

The oscillator is a crystal stabilized squarewave oscillator followed by a squarewave to sine converter. Automatic gain control and temperature compensation are built-in. The oscillator output drives the transducer and is converted to sound.

Version with MB-190 BOX (case)



Ordering information :

Order No.	Name
230111	SC-1 + CA-1/2 + CA-1/4 Sound Calibrator
230112	SC-1 + CA-1/2 + CA-1/4 + case Sound Calibrator
230110	SC-1 Sound Calibrator
230210	CA 1/4 Adapter
230220	CA 1/2 Adapter
230230	CA 8 Adapter
230290	CA cust, specify diameter

ACCESSORIES



SIGNAL CONVERTER

Signal converter SA-P48/CCP-C



Signal converter, Phantom-power to CCP to adapt CCP powered microphones and sensors to phantom power. Needed for 3rd party microphones.

Note: iSEMcon's ICP microphones are Phantom power compatible without the use of an signal converter.

- linear frequency response

- 4mA CCP power
- 18...48v Phantom power, 12V operation microphone dependent
- BNC CCP input connector

Features:

Selfbiasing - depends on attached CCP device
 Improved Voltage Surge Protection
 Compatible (ICP®, IEPE®, Deltatron®, AcoTron®, Isotron®, Piezotron® *1)
 Compact design
 Temperature: -10 to +55°C (+14 to +131°F)

Ordering information :

Order No.	Name
340020	SA-P48/CCP-C

ADAPTERS



XLR male to BNC Adapter CV-BFXM

Adapter for ICP microphone to XLR connection



XLR-male to BNC socket. Wired according to IEC 268-12: pin 2 = signal / pin 1 and 3: connected to ground

CCP-Phantom compatibility is an ISEMcon microphone inherent feature. Do not apply Phantom Power to competitors products. This may cause damage.

Ordering information :

Order No.	Name
650011	CV-CFXM

SHOCKMOUNT

MH-SH19 Shockmount



Features

For use with our EMX-7150 microphone.
 Use from diameter 19...20 mm



Ordering information :

Order No.	Name
222050	MH-SH19

CABLES



iSEMcon supplies all cables used with our microphones and measurement equipment. If you need a special cable request for a quote.

Ordering information :

Order No.	Name	
710010	CX-CCM-2m	Coaxial cable, BNC -BNC, 2m
710011	CX-CCM-5m	Coaxial cable, BNC -BNC, 5m
720010	CX-ACM-2m	Coaxial cable, SMA -BNC, 2m
720011	CX-ACM-5m	Coaxial cable, SMA -BNC, 5m
730010	CX-BFCM-2m	Coaxial cable, SMB -BNC, 2m
730011	CX-BFCM-5m	Coaxial cable, SMB -BNC, 5m
740010	CX-mXLR-2m	XLR-XLR-Cable 2m
740011	CX-mXLR-5m	XLR-XLR-Cable 5m
750010	CX-BFBF-2m	Coaxial cable SMB-SMB 2m
750011	CX-BFBF-5m	Coaxial cable SMB-SMB 5m
760010	CX-BFXM-2m	Coaxial cable XLRm-SMB 2m
760011	CX-BFXM-5m	Coaxial cable XLRm-SMB5m

HOLDING CLAMPS

Holding clamp MH-99/SW



Microphone clamp well suited for round and conical microphones, 5/8" thread, spring load



Microphone clamp well suited for round microphones, 5/8" thread, snap-in, our EMX-7150 standard

Ordering information :

Order No.	Name
222010	MH-99/SW
220010	Flexible Holding device for 1/2" mm microphone MH-13D-SNK
220011	Flexible Holding device for 7mm microphone MH-07D-SNK
222020	MH-CH19 snap-in clamp

MH-13D-SNK and MH-07D-SNK Microphone holding device, flexible, 1/2" "snake-hold"

Features:

- 1/2" /13mm) microphone use or 1/4" (7mm), Nylon clamp screw
- 3/8"-16 und 5/8"-27 standard thread
- Color: black/grey
- Material: POM/PVC
- Temperature: -20 to +65°C (-4 to +149°F)



BUSHING

MH-13D-CA Microphone Bushing for 13D082 housing



Adapts 1/2" diameter microphone to standard microphone clamp MH-C/SW

Features:

- Inner diameter 1/2" (13mm)
- Outer diameter 18mm
- Color: black, other colors upon request
- Material: PVC, other material upon request
- Temperature: -20 to +65°C (-4 to +149°F)

MH-07D-CA and MH-7101-CA



Microphone bushing for use with 07D146 and 7101 series microphones adapts 1/4" diameter microphone to standard microphone clamp MH-C/SW

Features:

- Inner diameter 1/4" (7mm)
- Outer diameter 18mm
- Color: black, other colors upon request
- Material: PVC, other material upon request
- Temperature: -20 to +65°C (-4 to +149°F)

Ordering information :

Order No.	Name
220021	Microphone bushing MH-07D-CA
220022	Microphone bushing MH-07D/7101-CA
220020	Microphone bushing MH-13D-CA

WINDSCREEN

SWS-7 windscreen

TYPICAL APPLICATIONS

Open Air Acoustics
Dynamic Drive Testing

FEATURES

1/4" (7mm) mounting ring
Windscreen
Dust Protection
Dirt Protection
Spray water (light rain) protection
Trickle water stop

The SWS-7 microphone protector is designed to protect your measurement microphone from harmful conditions with minimized influence of the sound field.

The microphone protector consists of a metal grid covered from impregnated acoustic permeable foam and a mounting ring with O-ring inside.

The mounting ring together with the O-ring make it stay on the microphone body and keeps off trickle water draining from the microphone body to the



The foam covered grid drains spraying water from the microphone front. The protection is good for limited amounts of water, dust and dirt. It cannot protect from heavy rain conditions.

Acoustically permeable foam cannot protect from water in total.

Ordering information :

Order No.	Name
240020	SWS-7 Protector/Windscreen

CASES

MB-#30-BOX

Dust-/Waterprotection and Shock-Resistant

The ideal case for our microphones and calibrator. Protects from humidity (O-ring seal), dust and shock. Comes with fold down molded handle and purge valve for easier opening under altitude conditions. Upholstered using single pre-cut Polyurethane foam layer and knob foam padding (bottom and cover).



MB-190-BOX

Dust-/Waterprotection and Shock-Resistant



MP-22S Microphone Neoprene Pouch

Shock-Resistant



Ordering information :

Order No.	Name
250010	MB-230-BOX: Weight approx. 1.24 lbs. (560g), Outside dimensions approx.. 210 x 167 x 90 mm, inside 186 x 123 x 75 mm. Volume approx. 0.26 gal 1.7 l.
250020	MB-330-BOX: Weight approx. 3.53 lbs. (1600g), Outside dimensions approx.. 330 x 280 x 120 mm, inside 300 x 220 x 90mm, Volume approx. 1.56 gal (5.9 l)
250030	MB-430-BOX: Measurement Equipment Case - Dust-/Waterprotection and Shock-Resistant - 520 x 415 x 195 mm
250060	MB-190 BOX: Measurement Equipment Case - Dust-/Waterprotection and Shock-Resistant - 190 x 167 x 90 mm
260010	MP-22S: Neoprene Pouch

APPLICATION NOTES



SAMPLE CALIBRATION SHEET



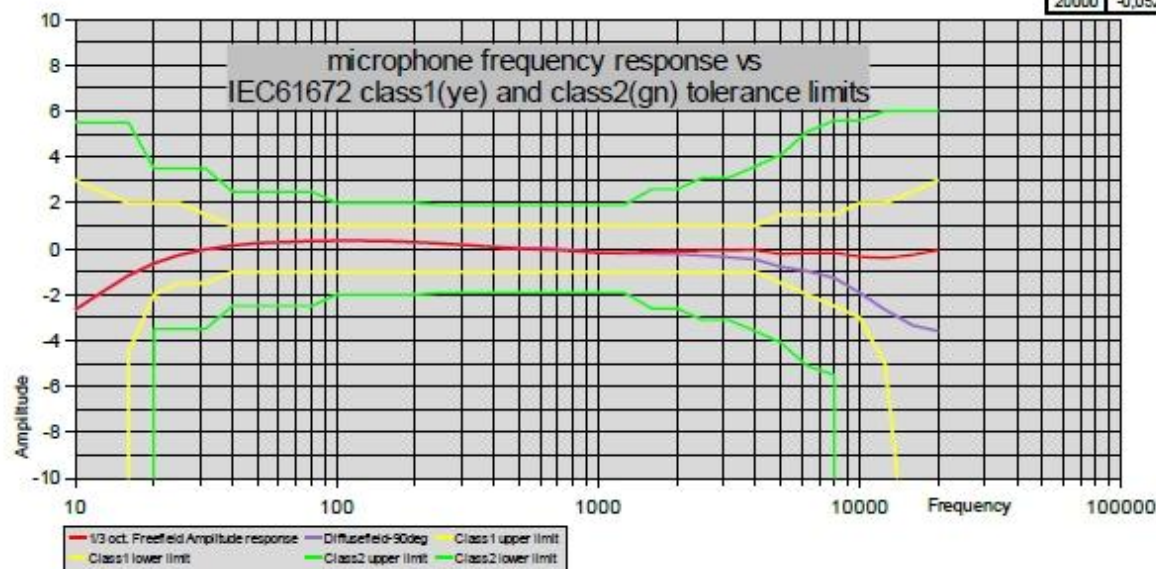
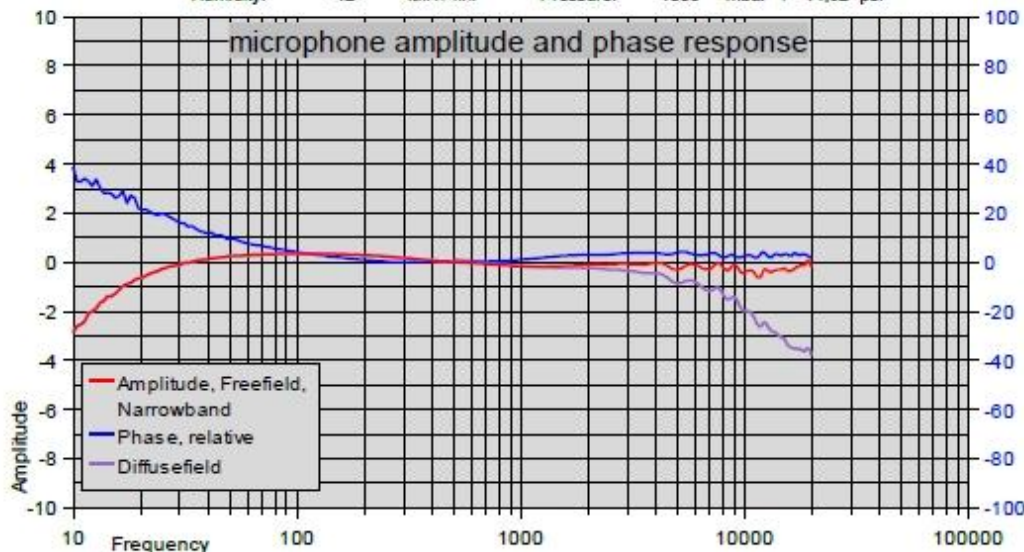
Microphone Frequency Response Measurement Report

iSEMcon GmbH • Alexanderstr.66 • 68519 Viernheim Germany • www.iSEMcon.de • sales@iSEMcon.de

Customer:
 Microphone Manufacturer: iSEMcon GmbH
 Serial No.: 2321103
 Address:
 Model: EMX-7150
 Preamp:

Measurement Date: 09.08.11 dd-mm-yy Temperature: 24,1 °C / 75,38 °F
 Humidity: 42 %r.F. / r.H. Pressure: 1008 mbar / 14,62 psi

1/3 Octav-Centref	Amplitude
10	-2,660
12,5	-1,932
16	-1,167
20	-0,638
25	-0,268
31,5	-0,023
40	0,138
50	0,248
63	0,295
80	0,337
100	0,350
125	0,347
160	0,326
200	0,286
250	0,233
315	0,157
400	0,073
500	0,004
630	-0,046
800	-0,094
1000	-0,179
1250	-0,172
1600	-0,138
2000	-0,098
2500	-0,082
3150	-0,076
4000	-0,058
5000	-0,228
6300	-0,183
8000	-0,177
10000	-0,338
12500	-0,412
16000	-0,264
20000	-0,052



Microphone sensitivity: P48: 6,93 P24: 6,72 P12: 6,47 mV @ 94dBspl,1kHz
 Microphone power supply: Phantom 12V / 24V / 48V

Reference microphone: Brüel & Kjaer 4133
 Sound calibrator: Quest CA-22

This document doesn't represent a NIST (USA) or PTB (Germany) traceable calibration.
 Die dokumentierten Kalibrierdaten sind weder auf die NIST (USA) noch auf die PTB (Germany) rückführbar.

This calibration sheet does not classify the microphone being class1 or class2 compliant as per IEC61672 .
 Es erfolgt keine Einordnung des Mikrofons gemäß IEC61672 Klasse 1 oder Klasse 2.

FREEFIELD vs. DIFFUSEFIELD USE

Only a small percentage of all acoustical measurements are performed in a well defined and/or well controlled environment of an e.g. acoustical laboratory – on the contrary most acoustical measurements are done under not really controlled conditions. Here are some hints on how to use our microphone.

Sound Fields:

Free field: There are no reflecting objects, only the microphone disturbs the sound field.

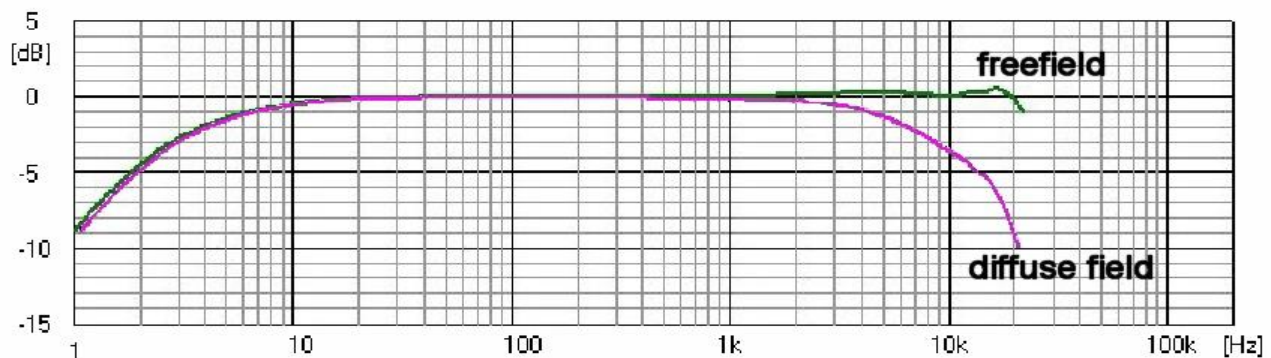
Diffuse field: There are many reflecting surfaces or sound sources so that the sound waves arrive from all directions.

Pressure field: This is found in small confined spaces like sound calibrators.

Depending on the nature of the sound field an appropriate microphone, which is optimized for the sound field could be selected. Unfortunately there are many practical situations where the sound field is not really of a well defined type. This application note should give you an idea on how to measure with a free field response microphone.

The free field microphone is the most common in use, chosen on tradition but we should know about the sound field.

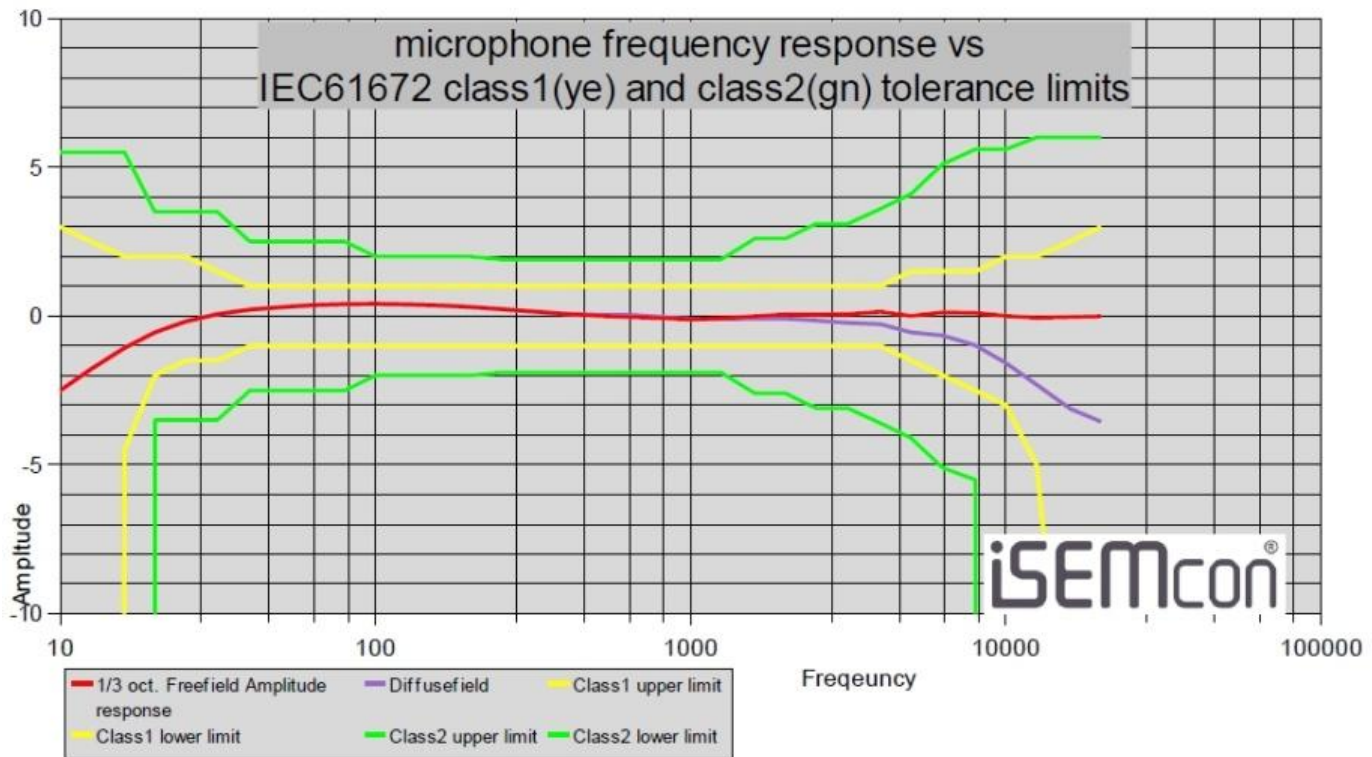
The following picture shows both the free field and the diffuse field response of a free field microphone.



The diffuse field response is not easy to measure, because it is not easy to generate a truly diffuse sound field over a wide frequency range but there is a known procedure to estimate the diffuse frequency behavior of a free field microphone.

From literature we know, that a microphone's random (diffuse) incidence response can be approximated by measuring the 90 deg incidence response relative to a single sound source.

While it is an approximation only iSEMcon has measured the 90deg response of many EMX-7150 microphones and used the averaged data to generate a 19th order polynomial. This is now used to approximate the "diffuse field" response from the microphones free field response data.



Typical freefield measurement:

Speaker measurement. The microphone should target to the sound source (speaker)



Typical diffusefield measurements:

Concert SPL monitoring (normally at FOH), Room Acoustics measurement (RT60): the microphone should not target to the sound source. Let it target to the ceiling. This is the most practical way.

Picture left shows EMX-7150 microphone together with shockmount and floor-stand

CALIBRATION DATA FILE FORMAT

Data file format stored in #####.cal

Human readable ASCII file (text-file).
Standard delimiter is “,”.

Freefield response data:

www.iSEMcon.com freefield
Sensitivity 30,88 mV/Pa @1kHz
10,00 -0,02
10,40 0,03
10,82 0,06
11,26 0,10
11,71 0,14
12,18 0,17
.....
..... 0,94
19945,31 0,94
19968,75 0,93
19992,19 0,93
^ frequency (Hz) ^amplitude response (dB)

Diffusefield response data derived from
freefield data (90 deg frequency response
measurement as per B&K literature)

www.iSEMcon.com diffusefield
Sensitivity 30,88 mV/Pa @1kHz
10,00 -0,02
10,40 0,03
10,82 0,06
11,26 0,10
11,71 0,14
12,18 0,17
.....
..... 0,94
19945,31 2,94
19968,75 2,93
19992,19 2,93
^ frequency (Hz) ^amplitude response (dB)

iSEMcon's SAFETY CLAUSE



Safety clause and unauthorized applications

Products manufactured and/or sold (hereinafter products) by iSEMcon GmbH and/or iSEMcon LLC, (hereinafter iSEM) are not designed for use as a component in any life support, life safety, or other comparable

application. Our products should not be used in any application where the failure or faulty performance of the product might create a risk of personal injury or death. Buyer assumes all risk of loss, damage or injury alleged to arise from the failure or faulty performance of an iSEM product in any unauthorized application. Buyer agrees to indemnify and hold harmless iSEM, and its directors, employees, agents, representatives and sales partners, from and against any and all claims, costs, damages, losses and expenses including attorney fees which arise from or are alleged to have been caused by any claim for personal injury or death connected with buyer's use of an iSEM product in any unauthorized application, including claims which allege that iSEM has been negligent in connection with the design or manufacture of the product.

iSEMcon GmbH
iSEMcon LLC
(June 2nd 2010)

IEC61672 Frequency response

IEC61672 class 1 frequency response

Our microphones are known to have an IEC61672 class 1 frequency response or being close to the class 1 limits. This should not be misunderstood. The entire microphone while build from electret condenser capsules using a metalized polypropylene diaphragm is not class 1.

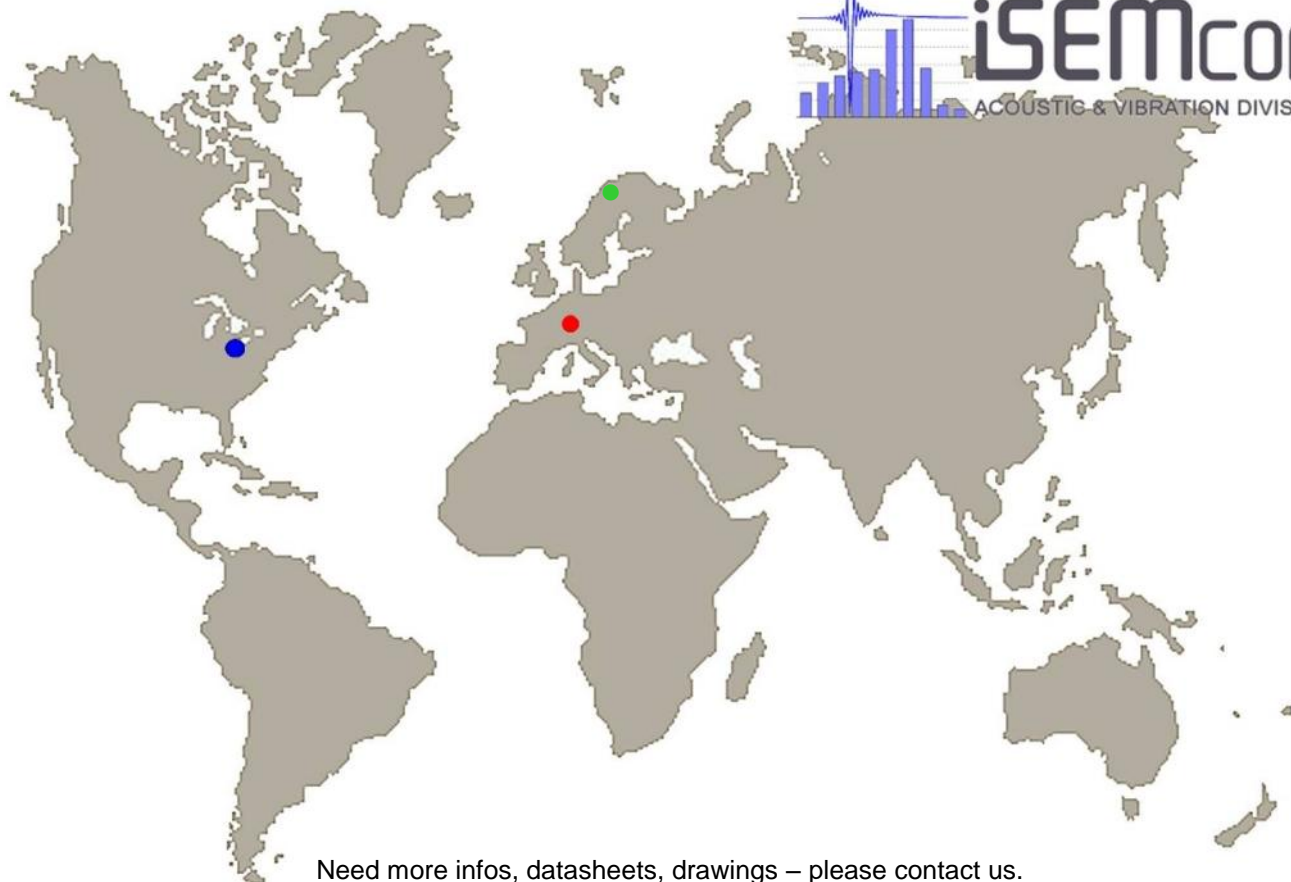
Many competitive products even sold for USD 1000 are using such prepolarized mylar diaphragm microphone cartridges.

Summarized: IEC 61672 class 1 addresses also the temperature and pressure behavior and is not only limited to “domestic” conditions and frequency response linearity.

iSEMcon's USER HINT – NO HOT PLUGGING



The EMX-7150 or any other Phantom Powered Microphone should not be plugged or unplugged into a mixer console or PA system unless the input channel is muted. If the system does not have a muting option the volume should be turned off. This avoids loud popping noise that can cause damage in speakers and/or affect your hearing.



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All products are made in Germany