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Yleistä.

Tämä käyttöohje käsittää CR 250 sarjan mittarit: CR252B ja CR251B

Mittarit täyttävät IEC 651 normin "general purpose" vaatimukset. Mittari näyttää "I" (Impulssi), "F"(nopea) ja "S"(Hidas) vasteet. CR 251B täyttää Tyyppi 1 ja CR252B Tyyppi 2 vaatimukset. Mittarissa on lisäksi pito (Hold)- ja Maksimi (Max) toiminto.

Suosittelut varusteet

Seuraavat varusteet on saatavana

CR:513A Akustinen kalibraattori

UA:237 Tuulisuoja

CK:250 Laukku

CP:22 Pehmeä laukku

Käyttöönotto.

CR 251B:ssä on esivahvistin MV 200B, joka liitetään mittarin päässä olevaan liittimeen.

Laitteen paristokoteloon kytketään 2 kpl 9V neppariparistoja 6F22

Varmista, että HOLD painike on OUT asennossa ja Wighting asennossa dBA.

Jos HOLD ei ole OUT asennossa on näyttö lukittu ja sen merkiksi on näytön keskellä kaksoispoiste.

Kytkin Display asetetaan vasempaan asentoon, jossa on teksti "BATT" jolloin näytöllä näkyy pariston jännite jonka pitäisi olla yli 15.0 mittaustarkkuuden varmistamiseksi. Tämän jälkeen kytkin voidaan asettaa asentoon "SPL". Käännä aluekytkin(range) asentoon 50 – 110 ja vastekytkin (response) asentoon SLOW. Mittari on valmis käyttöön.

Mittauksen onnistumisen varmistaminen.

Tarkista aina paristo ennen ja jälkeen mittauksen. CR:250 tarkkailee pariston kuntoa jatkuvasti mittauksen aikana.

Varmist, että HOLD painike on OUT asennossa. Tämä ylin kolmesta painikkeesta.

Tarkista mittarin kalibrointi mahdollisimman usein

Tarkan lukeman saamiseksi osoita mikrofoni äänilähdettä kohti ja etäällä seinistä.

Jos tuuli on yli 3 m/s on syytä käyttää tuulisuojaa. Tuulisuoja UA237 suojaa mikrofonia kolhuilta.

Älä käytä mittaria jatkuvasti yli 40 asteen lämpötiloissa koska lukemat voivat olla virheellisiä ja mittari voi vahingoittua.

Muista kytkeä mittari pois päältä käytön jälkeen.

Älä käytä mittaria sateella tai lumipyryssä. Vesi mikrofonissa aiheuttaa virheitä ja voi vahingoittaa mikrofonia pysyvästi.

Pidä mittari paikoillaan mitattaessa

Ulkona käytettäessä mittaukset on suoritettava kaukana suurista rakenteista, jotka aiheuttavat vääristäviä heijastuksia

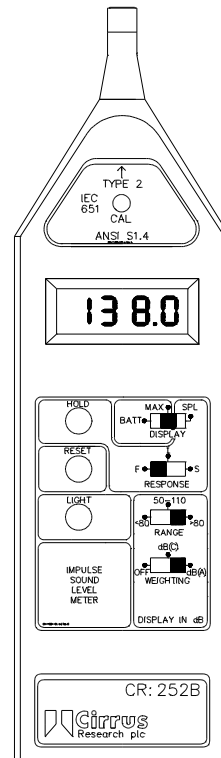
Säätimet

Painotus.

Painotus valitaan alimmalla kytkimellä. OFF asento kytkee mittarin virrattomaksi. Voit valita painotuksen dBC (C suodin) ja dBA (A suodin eli normaali korvan painotus).

Alue (Range)

Tällä kytkimellä valitaan mittarin mitta-alue. Kytkimen positio <80 vasemmalla ilmoittaa, että mittari mittaa alle 80 dB äänivoimakkuuksia. Kaksi muuta asentoa antavat alueeksi 50 – 110 dB ja 80 – 140 dB. Mittausalue on kaikkiaan 20 .. 140 dB. alempi alue riippuu käytetystä mikrofonista.



Vaste (Response)

Tämä kytkin valitsee aikavasteen eli nopeuden jolla näyttö reagoi äänentason muutoksiin. Vasteet ovat Hidas ("Slow"), Nopea ("Fast") ja ("Impulse"). IEC 651 standardin mukaiset nimitykset ovat 'S', 'F' and 'I'. I vasteella nousuaika on 35 ms ja laskeva aikavakio on 1.5 s, joten sitä voi käyttää vain yksittäisten impulssien mittaamiseen.

Näyttö

Näyttöä ohjataan ylimmällä kytkimellä. "BATT" asennossa mitataan paristojännite,

jonka tulee olla 15.0 vähintään. Kun mittauksen aikana jännite laskee alle 15 V ilmestyy näytölle "LO BAT" ilmoittamaan jännitteen alhaisuudesta, jolloin mittaus ei enää ole luotettava.

Oikeassa "SPL" asennossa mittari mittaa äänen tasoa.

Keskimmäisessä "MAX" asennossa näytölle tulee maksimi näyttö Maksimi näyttö voidaan nollata "Reset" painikkeella

Calibration Adjustment

LCD näytön yläpuolella on trimmi säädin, jolla vahvistusta voi säätää kalibroitaessa.

Reset

Nollaa maksimiarvomuistin.

Display Hold

Pysäyttää näytön

Taustavalo

Taustavalo kytketään alimmalla painikkeella

Display Functions

LCD näyttö näyttää äänenvoimakkuutta desibeleissä.

Näytöllä olevat symbolit ovat

Toiminto	merkki	syy	toiminto
Overload	+	vahvistimen ylikuorma	siirry ylemmälle alueelle
Ala-alue	-	pieni signaali	siirry alemmalle alueelle
Paristo alhainen	LO BATT	heikot paristot	vaihda paristot
Pysäytetty näyttö	:	Näyttö ei vaihdu	paina HOLD

Calibration

It is vital that the calibration of ANY sound level meter is checked before and after each measurement. If this is done, it is reasonable to assume that the calibration during the measurement was correct. If this is NOT done, you will not subsequently be able to be certain that the instrument calibration was correct and you can never be certain the sound level was as measured.

The sound level meter is calibrated acoustically using an external reference, e.g the Sound Level Calibrator CR:513A, which is placed over the microphone. The calibrator generates a stabilised Sound Pressure Level of 94dB (+- 0.3dB) at a frequency of 1kHz.

Recommended Calibrators

The normal field calibrator is the CR:513A, although the CR:511E and CR:512 units are also compatible with the CR:250 series. All of these acoustic calibrators meet the requirements of IEC 942. The gain of a sound level meter is the same for all weighting networks and thus it can be calibrated on dBA or dBC. However, a calibration correction is required for different microphones.

The CR:252B is fitted with the Class 2 MK:202 microphone capsule, whilst the CR:251B is fitted with either the Class 1 MK:224 or MK:226 capsules. Both of these microphone capsules have a free field to pressure calibration correction of -0.3dB.

This correction is required because of the differing pressure and free field sensitivities of the microphones. Thus with an MK:202A and CR:513A set on 94 dB, the instrument should be adjusted to read 93.7 dB.

Procedure

Remove any dust cover or windshield from the microphone, and fit the correct adaptor to the acoustic calibrator.

Check that the battery in the sound level meter is adequate. If not, replace the battery before calibrating the instrument.

Turn on the calibrator and check that the battery condition is adequate in the calibrator by turning it on. A 1kHz signal should be audible and if the Green LED is lit, the calibration signal is accurate.

Place the calibrator over the microphone and select a suitable measurement range on the sound level meter. This range should be the one that covers the 94dB calibration level. Now adjust the front panel **CAL** potentiometer so that the scale reading is 94dB minus the correction factor ie 93.7dB

If this cannot be achieved the microphone or instrument may be at fault and a check should be made with Cirrus Research.

As 'A' and 'C' weightings all have nominal zero correction loss at 1kHz, the reading on these two positions should be nominally the same. However, due to minor instrument tolerances there will be small divergences so it is recommended that calibration is performed on the actual weighting which will be used for measurement.

Replacing the batteries

Power to the CR:250 series is supplied by two 9V batteries. The specification of these batteries is IEC 6F22 or NEDA 1604. This is commonly known as PP3 in the UK.

The use of calculator quality batteries is recommended as these have a better exchange rate of current versus life. Mercury and NiCad batteries can also be used in the instrument and the Nickel Cadmium batteries only can, of course, be recharged although it is recommended they are removed from the instrument for this.

Rating Plate Information

In addition to the information specifically applied in this manual, certain other data is required to be specified in order to assure compliance with the requirements of IEC 651 and BS 5969. The data below is given in the form and order of the standard. The paragraph numbers refer to IEC 651.

The CR:250 series meet IEC 651, (BS 5969) Types 1, 2 and 3, depending on the microphone fitted.

IEC 11.2.1

For microphone data see separate sheet.

IEC 11.2.2

Reference direction is head on incidence, unless modified for the USA. where it is 30 degree to the axis.

IEC 11.2.3

The range of measurement with a typical assembly is:-

Continuous Signals

	CR:251B	CR:252B
Low Range	25dB(A) to 80 dB(A)	32 dB(A) to 80dB(A)
Mid Range	50dB(A) to 110 dB(A)	50dB(A) to 110 dB(A)
Hi Range	80dB(A) to 140 dB(A)	80dB(A) to 140dB(A)

Crest Factor 3

	CR:251B	CR:252B
Low Range	25dB(A) to 73 dB(A)	32 dB(A) to 73dB(A)
Mid Range	50dB(A) to 103 dB(A)	50dB(A) to 103 dB(A)
Hi Range	80dB(A) to 133 dB(A)	80dB(A) to 133dB(A)

Crest Factor 5

CR:251B

Low Range 25dB(A) to 68 dB(A)
 Mid Range 50dB(A) to 98 dB(A)
 Hi Range 80dB(A) to 128 dB(A)

CR:252B

32 dB(A) to 68 dB(A)
 50dB(A) to 98 dB(A)
 80dB(A) to 128 dB(A)

Crest Factor 10**CR:251B**

Low Range 25dB(A) to 62 dB(A)
 Mid Range 50dB(A) to 92 dB(A)
 Hi Range 80dB(A) to 122 dB(A)

CR:252B

32 dB(A) to 62 dB(A)
 50dB(A) to 92 dB(A)
 80dB(A) to 122dB(A)

The ranges for dB(C) measurements are the same as above except for the noise floor of the low range which becomes 32dB(C) for the CR:251B and 43dB(C) for the CR:252B

IEC 11.2.4

The reference sound pressure is 1Pa (94dB)

IEC 11.2.5

Frequency response (overall) is 'A' or 'C' weighting as table IV.

IEC 11.2.6

"F", "S" and "I" responses are fitted with a 'Hold' on the max RMS value of each.

IEC 11.2.7

An acceleration of 0.1g over the frequency range 63 - 4kHz results in a reading of less than 50dB on any axis or weighting.

IEC 11.2.8

1 oersted produces a reading of less than 50dB on any weighting.

IEC 11.2.9

The CR:252B and CR:251B instruments will operate from - 10 degree C to + 50 degree C with a maximum reading change of +0.5dB. The computer (dc log) output has a temperature co-efficient of +.20dB/degree C.

IEC 11.2.10

We recommend that the operator should be at least 1m from the microphone during measurement (see 16 below).

IEC 11.2.11

Less than +0.5dB change over 0 to 99% Relative Humidity.

IEC 11.2.12

Maximum storage temperature of +60 degree (+50 degree extended period) and 50% RH should be observed.

IEC 11.2.13

Cirrus Research plc extension cables up to 10 meters in length will not affect the calibration.

IEC 11.2.14

The UA:237 windscreen has a small effect on frequency response as follows:

Up to 1kHz	no effect
1259Hz	+0.1dB
1585Hz	+0.2dB
1995Hz	+0.3dB
2512Hz	+0.3dB
3162Hz	+0.3dB
3981Hz	+0dB
5012Hz	-0.1dB
6310Hz	-0.1dB
7943Hz	+0dB
10000Hz	-0.2dB
12590Hz	-0.7dB

IEC 11.2.15

The use of a pistonphone (PF 101B) is required to ensure long term compliance. For short term compliance the CR:513A may be used but this should be checked against a secondary or transfer standard annually.

IEC 11.2.16

The optimum position for the case and observer is 30 degree and 45 degree off axis to the microphone pre-amplifier. This implies use of a goose-neck or cable.

IEC 11.2.17

External filters are not possible.

IEC 11.2.18

Outputs are provided on the standard CR:252B and CR:251B. For details of the optional outputs refer to the specification.

IEC 11.2.19

The reference frequency used for calibration is 1kHz.

IEC 11.2.20

The reference range for IEC 651 purposes is the 50dB to 110dB measurement range.

IEC 11.2.21

The warm up period is 4 minutes although it is normally ready within 60 secs.

IEC 11.2.22

Not applicable.

IEC 11.2.23

See microphone data.

IEC 11.2.24

See microphone data.

IEC 11.2.25

Dummy microphone impedance is 18 pF in series with 50ohm.

IEC 11.2.26

Primary indicator range is 50dB(A) to 92dB(A)

(Centre Range Crest Factor 10)

IEC 11.2.27

Manual only.

IEC 11.2.28

+1dB at all frequencies greater than or equal to 31.5Hz.

Specification

Measuring range: (CR:252B)	32dB(A) to 143dB (A), 25dB(A) for CR:251B 43dB(C) to 143dB (C)
252B 251 mikrofonilla	25 dBA .. 140 dBA
Noise:	Signal to noise ratio normally better than 5dB at lower limit of capsule sensitivity for quoted range typically 1microV(A) 8 μ v (C)
Input impedance:	Typically 1 Gigohm
Weighting networks:	'A' and 'C'
Display:	3 ½ digit back lit LCD
Time weighting:	S (Slow) F (Fast) I (Impulse) All to IEC 651 relevant Type
Display functions:	Normal Max hold (S, F and I) Battery volts
Display flags:	Overload (+) Under-range (-) Battery Low (BATT LOW) Hold (:)
Power:	2 x 9V batteries 6F22 (40hr)
Operating Temperature:	-10 degree C to 50 degree C

Storage Temperature: -20 degree C to +60 degree C

Dimensions: Length 230mm
Width 75mm
Depth 25mm

Weight: 0.5kg

Output: 3.5mm 'Stereo jack socket'
DC out on tip, 25 mV /dB
AC out on ring.

CE Certificate of Conformity

Cirrus Research plc Hunmanby UK



CE Certificate of
Conformity

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Equipment Description

The following equipment manufactured after 1st January 1996:

CR:252B & CR:251B Sound Level Meters

Along with their standard accessories

According to EMC Directives 89/336/EEC and 93/98/EEC

meet the following standards

EN 50081-1 (1992)

Generic emission standard for residential, commercial and light industry

EN 50082-1

RF immunity implies that sound level indications will not be affected by more than ± 0.5 dB at a background level of 74dB(A) or less.


Signed

Dated 1st January 1998

S. O'Rourke
Director

Guarantee

Cirrus Research offer a 12 months guarantee on all of their units. This covers all parts and labour excepting only damage caused by the user. Because of the unique fragility of microphones, only internal short or open circuits are accepted as faults and not accident damage. The guarantee requires the user to return the unit to their nearest Cirrus Research Agent. This guarantee is in addition to any statutory rights in your country.

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