

# LOGGING PERSONAL NOISE DOSE METER INSTRUCTION MANUAL

## DB22-600DOSE



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allow moisture to enter the microphone, connectors, or casing.

c. Handling the instrument

Do not try to remove the microphone gird, you can easily damage the microphone in this way.

Do not attempt to open the instrument. There are no user-serviceable parts inside. If you think your instrument requires service, then please contact your dealer.

Do not allow the instrument to get wet.

Never mix different makes or types of battery.

Never mix charged and discharged batteries.

Do not allow fully discharged batteries to remain inside the instrument

Protect the instrument from impact. Do not drop it. Transport it in the supplied shoulder bag.

**14. SOFTWARE INSTALLATION AND OPERATION**

For the detailed instruction, please refer to the content of attached CD-ROM, which has the complete instruction of software operation and relevant information.

Protocol : are enclosed within the content of CD-ROM, please open the CD-ROM for details.

**1. GENERAL DESCRIPTION**

Thanks for you're selecting Personal Noise Dose Meter. To ensure that you can get the most from it we recommend that you read the manual carefully before use. The personal noise dose meter is test equipment to evaluate the noise condition of working environment by measuring the accumulated noise exposure. With this test data, company can ensure the related noise regulation is followed or decide whether or not to apply certain noise reduction action to avoid the acoustic trauma and noise-induced hearing loss occurs to the working personnel.

This Noise Dose Meter meets the GB/T 15952 standard.

**2. PRINCIPLE OF MEASURING ACCUMULATED NOISE EXPOSURE**

DOSE is a parameter used to quantify noise exposure measured in a period, during turns of % noise exposure relative to 90dBA for 8 hours.

i.e. 100% DOSE = 90dBA for 8 hours

This is known as the Criterion. Other criterion are available such as 100% DOSE = 85dBA for 8 hours to meet legislation in different countries.

If the person stayed in this environment for 4 hours, he would receive 50% DOSE.

Also if the noise level was say 93dBA, 3dB higher, a 100% DOSE would be accumulated in only 4 hours, The above example is for a dose meter with 3dB Exchange Rate, where a 3dB increase in sound level corresponds to a doubling energy. A dose meter with 5dB Exchange Rate is also, available where the sound must increase by 5dB to double the dose as required to meet noise legislation in some countries.

**3. INTRODUCTION TO THE DOSE METER**

The Noise Dose Meter measure the frequency weighted noise exposures and peak sound levels simultaneously.

The meter have the following features.

\* Simple operation, including direct read-out of results.

\* Eight built-in standard dose measurement setups : OSHA80, OSHA90, MSHA-80, MSHA-90, DOD, ACGIH, ISO85 and ISO90.

\* Nine user – defined measurement setups.

\* A single sound level meter (SLM) setup.

\* 50 dose (DATA) result stores.

\* Download of setups from PC to the meter.

\* Keypad lock protects meter against accidental operation.

\* Timers support pre-selection of measurement time and duration.

\* USB PC interface.

The meter is ideal for quick on-site surveys and for monitoring personal noise exposure in accordance with European ISO or USA OSHA, MSHA, DOD AND ACGIH standards.

The meter is two overlapping measurement ranges : 60 – 130 & 70 – 140dB, A & C RMS weightings, Linear & C Peak weightings, Fast & Slow time weightings, and energy exchange rates (Q) of 3, 4, 5 & 6. In dose measurement mode, it display % dose, % dose projected for an 8 hour period, peak level and measurement duration.

For countries that are subject to European Union regulations or the

equivalent ISO standards, the meter measure the daily sound exposure level (LAeq,8hr,Pa<sup>3</sup>h according to IEC 61252, which is identical with the L EX,8h required by ISO 1999), while for USA OSHA/MSHA regulations they measure the Time Weighted Average level (TWA).

When used as a sound level meter it display sound level, time-averaged (LAeq) sound level, peak and sound exposure level (SEL).

The meter is automatic run timing facilities controlled by the built-in clock and time-history recording capabilities. Sampling times can be specified between 1s and 1 hour, while storage is 120000 data points.

The meter is able to measure and save up to five specified Ln values (Statistical noise levels). Run duration, start and stop times preset, and other setting via the meter keys or software.

#### 4. SPECIFICATION

Standard applied: IEC61252, ANSI S1.25 – 1992 for dose meter and sound exposure meters. IEC 61672-1-2013 Class 2

Microphone: 1/2-inch electret condenser microphone with 31-inch integral cable.

Display: Liquid Crystal Display

Measurement Ranges

Linearity and Indicator ranges at 4KHz :

60 – 130 : 60 – 130dB (A and C)

70 – 140 : 70 – 140dB (A and C)

Peak Ranges:

C – weighted or Linear Peak over the top 40dB of each measurement range:

60 – 130 : 93 – 133dB Peak

70 – 140 : 103 – 143dB Peak

Frequency Weightings: RMS Detector : A or C

Peak Detector : C or Z (Linear)

Time Weightings: Fast and Slow (RMS detector)

Exchange Rate: 3, 4, 5 or 6dB

Stabilization Time: 10 seconds from power on

Threshold and Criterion Levels

From the setup, predefined in the built – in setup according to applicable standards.

User-defined setups in the following ranges:

Threshold Level: 70 – 90dB in 1dB steps

Criterion Level: 80, 84, 85 or 90dB

Overload Indications: At 0.1dB above the top of the selected measurement range.

Under-Range Indications: At 1dB below the bottom of the selected measurement range.

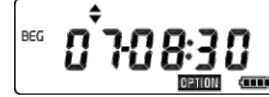
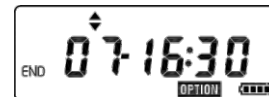
High Level Detector: 115dB

Keypad Lock

Lock and unlock by pressing key combinations: Up and right arrows to lock; left and down arrows to unlock.

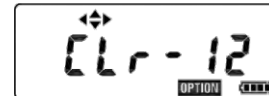
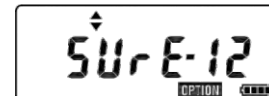
Clock: Real-time clock with calendar.

Memory: Results from 50 measurements can be stored for later viewing and download.

7. Review Start / End Times	UPkey		This is the First beginning (start) time set: dd-hh:mm. The day setting is the day of the month. When day “ - - ” is indicated, measurement will start on the current day.
1. Review Start / End Times	UPkey		This is the First end (stop) time set : dd-hh:mm. Press RUN/PAUSE/ENTER key to enable, use UP key, DOWN key, LEFT key and RIGHT key to selecting the End (stop) time (dd-hh:mm), then confirm with RUN/PAUSE/ENTER key.
2. Review further Start / End Times	RepeatUPkey	Start/ Endtimes	The display stop through 16 sets of Start /End times.

#### 12-4 Clear Memory Data

Use this option with caution – IT DELETES ALL STORED DATA!

Operation	Press	Display Shows	Comments
1. Select Clear memory Data Option	RIGHT key		Follow on from Section 12-1.
2. Enable Clear memory Data	UP key		Press RUN/PAUSE/ENTER key to Clear all stored data and “SurE-” is displayed.

#### 13. MAINTENANCE

##### (1) Service and Repair Noise Dose Meter

The Noise Dose Meter is designed and constructed to provide many years of reliable operation. However, if a fault occurs that impairs the dose meter is correct function, then remove the batteries to prevent risk of further damage.

For more information about preventing or identifying faults or damage to your dose meter is, please read the other sections of this chapter.

For repair, contact your local dealer.

##### (2) Care, Cleaning and Storage

The Noise Dose Meter is a delicate precision instrument. When handling, storing, or cleaning your instrument, please takes note of the following precautions:

###### a. Storing the Instrument


Keep the instrument in a dry place.

For long-term storage, remove the batteries

Do not exceed storage temperature limits of -10 to +60°C ( -14 to +140°F ).






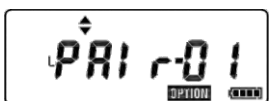
###### b. Cleaning the Instrument

If the instrument casing becomes dirty, then wipe it with a cloth lightly dampened with water. Do not use abrasive cleansers or solvents. Do not

4. Save the Changes	RUN/PAUSE/ENTER key		The new time setting is stored.
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Repeat this process in the Date Option to set the date : PLEASE NOTE that the date format is dd-mm-yy.

### 12-3 Change Timer & Run Duration

Operation	Press	Display Shows	Comments
1. Select Timer Option			Follow on from Section 12-1.
2. Switch Timer ON	RUN/PAUSE /ENTER key		The Timer is now ON so that any start and stop times will be used, UNLESS Duration (DUR) settings are enabled as in step4.
3. Review Logging Period	UP key		LP allows the user to select a Logging Period time. Press RUN/PAUSE/ENTER key to enable, use UP key and DOWN key to select the following Logging period : 1, 2, 5, 10, 15, 20, 30 seconds, 1, 2, 5, 10, 15, 20, 30, 60 minutes.
4. Review Duration setting	UP key		DUR allows the user to select a run duration time. When a run duration period is shown here, these take precedence over the Timer setting so that any preset start and stop times WILL NOT BE USED. Press RUN/PAUSE/ENTER key to enable, use UP key and DOWN key to select the following duration: OFF, 5, 10, 15, 30 minutes, 1, 2, 4, 8, 10, 12, 24 hours, then confirm with RUN/PAUSE/ENTER key.
5. Review Repeat setting	UP key		Rept allows the user to select up to 49 repeats of the timer settings. Press RUN/PAUSE/ENTER key to enable, use UP key and DOWN key to select the number of repeats then confirm with RUN/PAUSE/ENTER key.
6. Review Start / End Times	UP key		This is the First logging time pair. Press RUN/PAUSE/ENTER key to enable/disable each time pair. When a pair is disabled, the L icon will be disappeared.

### Measurement Control

Measurement Duration: May be set to 5, 10, 15, or 30 minutes or 1, 2, 4, 8, 10, 12, or 24 hours.

Timers: Up to 16 timers (automatic start and stop) can be set (maximum up to one month ahead of measurement time).

Timer Controlled Started / Stop: Set up from the PC software or meter keypad.

Logging: All measurement parameters values can be logged.

Logging Period (LP): 1s, 2s, 5s, 10s, 15s, 20s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min or 60min.

Logging Capacity: 120000 values can be stored at any one time.

Setup: Eight built-in (predefined) default setups are included. Nine additional user-defined setups can be stored.


Setup	OS HA- 80	OS HA- 90	MS HA- 80	MS HA- 90	DOD	ACGIH	IS O- 85	IS O- 90	Us er1 - 9	SLM
Measurement Range(dB)	70-140	70-140	70-140	70-140	70-140	70-140	70-140	70-140	70-140	70-140
TimeWeighting	Slow	Slow	Slow	Slow	Slow	Slow	Fast	Fast	Fast	Slow
Frequency Weighting	A	A	A	A	A	A	A	A	A	A
Peak Frequency Weighting	Lin	Lin	Lin	Lin	Lin	Lin	C	C	C	Lin
ExchangeRate	5	5	5	5	4	3	3	3	3	3
Threshold(dB)	80	90	80	90	80	80	70	70	80	N/A
Criterion Level (dB)	90	90	90	90	85	85	85	90	90	N/A
Allow User to ChangeSetup	No	No	No	No	No	No	No	No	Yes	Yes

Measurement Parameters

OSHA - 80	OSHA - 90	MSHA - 80	MSHA - 90	DOD	ACGIH	ISO-85	ISO-90	User 1 - 9	SLM
DOSE%	DOSE%	DOSE%	DOSE%	DOSE%	DOSE%	DOSE%	DOSE%	DOSE%	SPL
PDOSE%	PDOSE%	PDOSE%	PDOSE%	PDOSE%	PDOSE%	PDOSE%	PDOSE%	PDOSE%	MAX
TWA	TWA	TWA	TWA	TWA	LEP <sub>d</sub>	LEP <sub>d</sub>	LEP <sub>d</sub>	TWA	LEQ
PTWA	PTWA	PTWA	PTWA	PTWA	LEQ	LEQ	LEQ	PTWA	SEL
LAVG	LAVG	LAVG	LAVG	LAVG	SEL	SEL	SEL	LAVG	PKZ
LEQ	LEQ	LEQ	LEQ	LEQ	SE(Pa <sup>2</sup> h)	SE(Pa <sup>2</sup> h)	SE(Pa <sup>2</sup> h)	LEP <sub>d</sub>	
SEL	SEL	SEL	SEL	SEL	MAX	MAX	MAX	LEQ	
MAX	MAX	MAX	MAX	MAX	PKZ	PKC	PKC	SEL	
PKZ	PKZ	PKZ	PKZ	PKZ	L10	L10	L10	SE(Pa <sup>2</sup> h)	
L10	L10	L10	L10	L10	L50	L50	L50	MAX	
L50	L50	L50	L50	L50	L90	L90	L90	PKZ	
L90	L90	L90	L90	L90	L95	L95	L95	L10	
L95	L95	L95	L95	L95	L99	L99	L99	L50	
L99	L99	L99	L99	L99	SPL	SPL	SPL	L90	
SPL	SPL	SPL	SPL	SPL				L95	
								99	
								SPL	

Output: USB interface.

Battery: 4pcs. Size AAA alkaline batteries

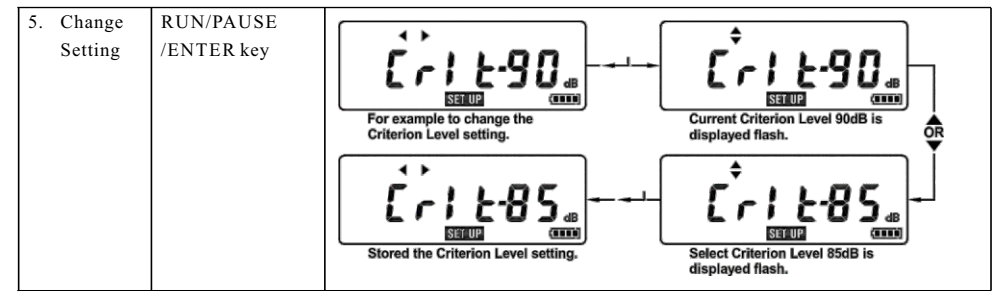
Battery Indicator: Symbol indication battery voltage level in 4 steps. “” indicated flash when voltage is insufficient for operation.

Operating Temperature & Humidity: 0 – 50°C (32 to 122°F), 10 – 90%RH

Storage Temperature & Humidity: -10 – 60°C (14 to 140°F), 10 – 75%RH

Size: 140x77x32mm

Accessories: Main Unit, Sensor, Software CD, USB cable, Instruction manual, Carrying case.



12. SELECTING & CHANGING OPTIONS

The OPTION mode allows the following items to be checked or adjusted.

Adjustment of the calendar clock and time, battery voltage.

Activating the Run Timer commands set via the meter keys.

12-1 Review Options

Operation	Press	Display Shows	Comments
1. Switch the meter ON	POWER/MENU key		Start from the Sound Level Meter mode.
2. Change Mode	POWER/MENU key several times		Optional operations showing Current Time.
3. Next Option	RIGHT key repeatedly		The display cycles through the rest of the options: Current Time – hh:mm:ss Current Date – dd:mm:yy Battery condition – Battery voltage Timer Status Data Clear – Use this option with caution – IT DELETES ALL STORED DATA!

12-2 Set Time & Date

Operation	Press	Display Shows	Comments
1. Select Time Option	POWER/MENU key		Following on from Step 2 in Section 12-1.
2. Enable Time Change	RUN/PAUSE/ENTER key		Cursors are enabled and the hours entry blinks to show it can be edited.
3. Change the entry	UP key or DOWN key		Use LEFT key and RIGHT key to highlight an entry. Use UP key and DOWN key to change the entry.

4. If required Change Setting	RUN/PAUSE /ENTER key	<p>For example to change the Range.</p> <p>Current Range 70-140dB is displayed flash.</p> <p>Stored the range setting.</p> <p>Select Range 60-130dB is displayed flash.</p>	
5. Switch OFF	POWER/MENU key press 3 seconds	Blank Screen	No operation are possible.

## 11. CHANGING USER 1 – 9 SET UP

Operation	Press	Display Shows	Comments
1. Switch the meter ON	POWER/MENU key		Comments Start from the Sound Level Meter mode.
2. Change Mode	POWER/MENU key several times		To select SETUP mode. The first display always shows the currently loaded Setup. Loaded message (L) shows the Setup is now active.
3. Select another Set Up	DOWN key several times		Select required Set Up from User 1 to User 9 (for example select User1).
4. Inspect User 1 current Setting	RIGHT key several times	<p>Press → to enable 60-130dB or 70-140dB Ranges setting.</p> <p>Press → to enable Fast or Slow Time Weighting setting.</p> <p>Press → to Load User1 Set Up for use.</p> <p>Press → to enable 3,4,5 or 6dB Exchange Rate setting.</p> <p>Press → to enable 80,84,85 or 90dB Criterion Level setting.</p> <p>Press → to enable A or C Frequency Weighting setting.</p> <p>Press → to enable 70-90dB in 1dB steps Threshold Level setting.</p> <p>Press → to enable PKZ or PKC Maximum Peak setting.</p>	

## 5. NOMENCLATURE AND FUNCTIONS



1. Microphone
2. Display panel
3. POWER/MENU key:
  - 1 Power on-off control.  
Press POWER key to turn on the meter.  
Press POWER key 3 seconds to turn off the meter.
  - 2 MENU: Changes operating mode.
    - a. Press MENU key to select Sound Level Meter mode ( SLM ), Measure, Store and Recall Data mode ( DATA ), Dose set up mode ( SET UP ) and Selecting and Changing Options mode ( OPTION ) in cycles.
    - b. In the data recording mode ( DATA REC ), press MENUkey then press key immediately to exit this mode.
4. LEFT key: Select active options from the current menu.
5. DOWN key: Select active options from the current menu.
6. UP key: Select active options from the current menu.
7. RIGHT key: Select active options from the current menu.
8. RUN/PAUSE/ENTER key:

1 ENTER: confirms actions of other keys.

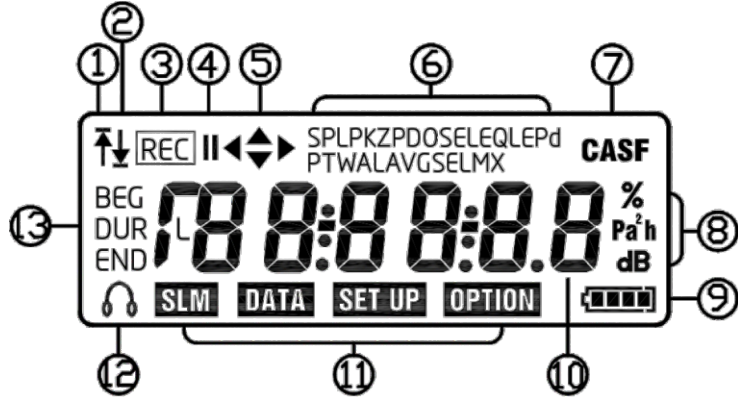
2 RUN/PAUSE: In the Measure and store Dose Data mode ( DATA REC ) Starts / Pauses / Restarts a measurement record.

9. CAL screw

10. Battery cover

11. USB interface connector

## 6. DISPLAY PANEL DESCRIPTION



1. Overload has Occurred

2. Under range has Occurred

3. Data is being Recorded

4. Measurement is Paused

5. Indicates Active Option Keys

6. SPL Sound Pressure Level

PK Maximum Peak (C-weighting)

PKZ Maximum Peak (Z-weighting)

DOSE Dose Percentage (Dose%)

PDOSE 8 Hour Projected (Projected Dose%)

LEQ Equivalent Continuous Sound Level (Leq), exchange rate 3dB

LEPd Sound Exposure Level (LEP,d) uses 8 hours reference duration

TWA Time Weighted Average uses 8 hours reference duration

PTWA 8 Hour Projected TWA

LAVG Average Sound Level (Lavg), exchange rate 3, 4, 5 or 6dB (as applicable, according to set-up)

SEL Single Event Noise Exposure Level (LE or SEL)

SE Sound Exposure (Pa<sup>2</sup>h)

MAX Maximum Sound Pressure Level (Lmax)

7. C Frequency Weighting C

A Frequency Weighting A

S Time Weighting Slow



F Time Weighting Fast

8. % Pa<sup>2</sup>h dB Current Units

9. Battery Condition

10. Measured Data or Current Date or Time

Operation	Press	Display Shows	Comments
1. Switch the meter ON	POWER/MENU key		Start from the Sound Level Meter mode.
2. Review SLM Measurements	DOWN key several times	 Sound Pressure Level A-Frequency weighting Fast-Time weighting  Press → to enable Data Reset  Maximum Peak (L <sub>pk</sub> or LC <sub>pk</sub> )  Measurement Duration Time  Maximum sound level (MX)  Equivalent Continuous Sound Level (Leq)  Single Event Noise Exposure Level (LE or SEL)	
3. If required inspect current setting	RIGHT key several times	  Press → to enable 60-130dB or 70-140dB Ranges setting.  Press → to enable Maximum Peak PKZ or PKC setting.  Press → to enable A or C Frequency Weighting setting.  Press → to enable Fast or Slow Time Weighting setting.  Press → to enable 3,4,5 or 6dB Exchange Rate setting.	

6. If Required	RUN/PAUSE/ENTER key		The pause icon ( ) is shown. Press this key again to resume the run.
7. If Required	UP key		To lock the keys to prevent unauthorized tampering, The DATA mark is flashing displayed. The keys and display cannot be locked while the meter is paused.

### 9-3 Recall Dose Data

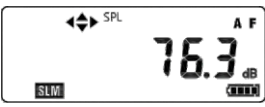



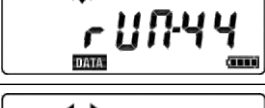

Measured date store while operating in the DATA mode.

Data from the run in progress can be inspected while the meter is recording, as described in steps 4 and 5 of section 9-2.

When the meter is stopped, with no data being saved, stored data can be retrieved and displayed.

### 9-4 Review Stored Data

Stored data is identified by date (day) and measurement start time (hh:mm). Up to 50 runs can be stored simultaneously.

Operation	Press	DisplayShows	Comments
1. Switch the meter ON	POWER/MENU key		Start from the Sound Level Meter mode.
2. Change Operating Mode	POWER/MENU key		To select DATA mode.
3. Enable Data Recall	RIGHT key		Display the Start Date & Time for the most recently stored run. (dd-hh:mm)
4. Review Stored Runs	DOWN key		Select Start Date & Time for required run.
5. Review Stored run	RIGHT key		Shows where data from the selected run is stored (store44).
6. Review Stored Data	RIGHT key		The stored data can be review as described in steps 4 and 5 of section 9-2.

## 10. OPERATING as a SOUND LEVEL METER

In SLM mode, the meter operates as a Type 2 sound level meter using setting made via the keypad, however, this mode cannot store data.

11. Current Mode Indication, Pressing the MENU key will select each of these in turn.

SLM Sound Level Meter mode indication

DATA Measure, Store and Recall Data mode indication

DATA Flashing displayed when lock the keys.

SETUP Dose Setup mode indication

OPTION Selecting and Changing Options mode indication

12. SPL over 115dB has Occurred

13. BEG Beginning (start) time setting indication

END End (stop) time setting indication

DUR a run Duration time indication

## 7. MEASUREMENT PREPARATION

(1) Load Battery

unscrews the big screw on the back of the unit and removes the carrying clip.

Insert four AAA-size alkaline batteries.

Note: Make sure the battery polarity is installed as indicated.

(2) Battery replacement

when the batteries is down, a low battery mark  flash in the display.

Batteries should be replaced with new ones and resetting the Time and Date.

(3) The battery symbol shows the remaining capacity the battery by the number of segments. The relative of the remaining capacity and the number of segments are show as below.

Four segments --- over 84% capacity remaining

Three segments --- over 66% capacity remaining

Two segments --- over 25% capacity remaining

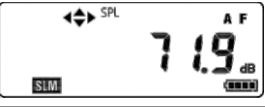
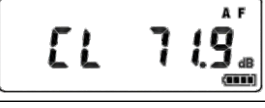
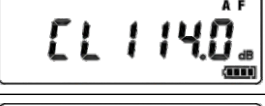
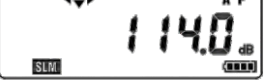
One segments --- over 11% capacity remaining

Empty battery --- Instrument specification not guaranteed.

## 8. CALIBRATION PROCEDURES

Using a standard 114dB acoustic calibrator

Insert the microphone housing carefully into the insertion hole of the calibrator.

Operation	Press	DisplayShows	Comments
1. Switch the meter ON	POWER/MENU key		Start Up message show FirmwareVersion then to the SoundLevelMeter mode.
2. Change Operation Mode	POWER/MENU key repeatedly		To select calibration mode, the "CL" mark is displayed.
3. Change Indicated Level			Turn on the switch of calibrator and adjust the CA screw of the meter, and the level display will indicate the 114.0dB reading.
4. Save the Calibration value and time	POWER/MENU key		Return to the Sound Level meter mode.

## 9. OPERATION as a DOSE METER

### 9-1 Select Dose Setup for Use

Operation	Press	Display Shows	Comments
1. Change Operating Mode	POWER/MENU key repeatedly		To select SETUP mode. The first display always shows the currently loaded set up, (for example OSHA dose measurement).
2. Select another Set Up	UP key several times		Select required Set Up from OSHA-80 (Threshold 80dB) dose procedures. OSHA-90 (Threshold 90dB) dose procedures. MSHA-80 (Threshold 80dB) dose procedures. MSHA-90 (Threshold 90dB) dose procedures. DOD dose procedures. ACGIH dose procedures. ISO85 (Criterion Level 85dB) dose procedures. ISO90 (Criterion Level 90dB) dose procedures. USER1~9 dose procedures.
3. Load Selected Set Up for use	RUN/PAUSE/ENTER key		Loaded messages (L) show the setup is now active (for example ISO procedure with 90dB criterion).

### 9-2 Measure and Store Dose Data

Operation	Press	Display Shows	Comments
1. Change Operation Mode	POWER/MENU key repeatedly		This is dose measurement where the display can show dose data. The time format is hh:mm:ss. The date format is dd-mm-yy( ) SPL display( )
2. Start Run	RUN/PAUSE/ENTER key		When the run TIMER is ON with Beginning and End times set, the meter waits showing the REC icon flash and the time remaining until the run starts. When the run TIMER is ON, the meter waits until the next whole clock minute, then starts the run. When the run TIMER is OFF, the meter waits until the next whole clock second, then starts the run.
3. Then			REC icon indicates that the meter is now storing dose data in the first available data store.

