sound level meter

- ☐ DB30-6228-B1
- ☐ DB30-6228-C1
- ☐ DB30-6228-D1
- ☐ DB30-6228-E1
- ☐ DB30-6228-F1
- ☐ DB30-6228-B2
- ☐ DB30-6228-C2
- ☐ DB30-6228-D2
- ☐ DB30-6228-E2
- ☐ DB30-6228-F2

user's manual

catalogue

I,Introduction

1.1 Primary Objectives and Scope of Application

This series of sound level meters is a digital multifunctional instrument specifically designed for noise assessment. It measures multiple parameters including frequency-weighted sound pressure level, time-weighted sound pressure level, equivalent continuous sound level, exposure sound level, and statistical sound level. The instrument offers eight operational modes: standard sound level meter, integrated average, parallel measurement, statistical analysis, 24-hour measurement, 1/1 octave band, 1/3 octave band, and indoor noise mode. Additionally, it features low-frequency frequency-weighted functionality, making it suitable for measuring secondary radiation noise.

This series of sound level meters complies with the requirements of national standard GB/T 3785.1-2010 and international standards IEC 61672-1:2013 "Sound Level Meter", GB/T 15952-2010 and IEC 61252:2002 "Specifications for Personal Sound Exposure Measurement Instruments", GB/T 3241-2010 and IEC 61260:2014 "Octave and Decade Filters". Building noise (indoor noise) meets the requirements of GB 22337-2008 "Community Noise Emission Standards" and GB 12348-2008 "Noise Emission Standards for Industrial Enterprises at Factory Boundaries". Secondary radiation noise conforms to JGJ/T 170-2009 "Limit Values and Measurement Methods for Vibration and Secondary Noise in Urban Rail Transit Buildings". 24-hour noise monitoring satisfies GB 3096-2008 "Environmental Noise Quality Standards" and HJ 640-2012 "Technical Specifications for Urban Environmental Noise Monitoring". Environmental monitoring point coding adheres to HJ 661-2013 "Coding Rules for Environmental Noise Monitoring Points". This series of sound level meters is a powerful, high-performance handheld instrument suitable for long-term, reliable, and precise measurement of various noises. The device is equipped with a 16GB memory card and comes with standard 5 AA batteries. For models featuring 24-hour measurement functionality, a portable power bank can also be used for power supply. Users can customize additional features including audio recording, scheduled shutdown, GPS tracking, and Bluetooth connectivity. This device is designed for on-site measurement of noise levels in electromechanical equipment, environmental noise, traffic noise, industrial hygiene noise, and workplace noise. The sound level meter series is available in both explosion-proof and non-explosion-proof variants. The explosion-proof model has obtained the required explosion-proof certification, marked with Ex ib I Mb and Ex ib IIb T4 Gb. Featuring dual protection, it is suitable for use in environments that meet the specified explosion-proof standards.

1.2 Configure

This series of sound level meters is a high-precision, powerful noise measurement instrument.
To meet the needs of different users, the series offers various model configurations,
distinguished by the suffix of the instrument model,
with each model featuring specific functional configurations.

This is shown in Table 1.

Model suffix	Type	Common Sound stage	Integration Average	Statistics Analyse	Parallel Measure	24-hour measu-rement	Indoor Noise	1/1 OTC	1/3 OTC
I									
B1	1 level	√	√	√	√				
C1	1 level	√	√	√	√	√			
D1	1 level	√	√	√	√	√	√		
E1	1 level	√	√	√	√	√	√	√	
F1	1 level	√	√	√	√	√	√	√	√
II									
B2	2 level	√	√	√	√				
C2	2 level	√	√	√	√	√			
D2	2 level	√	√	√	√	√	√		
E2	2 level	√	√	√	√	√	√	√	
F2	2 level	√	√	√	√	√	√	√	√

Table 1 Configuration Table of Various Models

1.3 Workplace Conditions

The working conditions of this series of sound level meters are as follows:

•Air temperature: 1 level-10℃~+50℃; 2 level 0℃~+40℃

•Relative humidity: 20%~90%; • Static pressure: 65 kPa~108 kPa.

1.4 Measurement Function

1.4.1 Brief Introduction

This series of sound level meters incorporates all standard sound level meter functionalities, with specific models and configurations detailed in Table 1. The core features include: Integral Time Setting (time range from 1 second to 99 hours 59 minutes 59 seconds).

The system defaults to manual mode when time is set to 0 (actual time: 99 hours 59 minutes 59 seconds), featuring automatic repeat measurement (1-99 cycles, with 1 cycle for single measurement) and repeat interval settings (0-99 hours 59 minutes 59 seconds, requiring ≥2 cycles). It offers three startup modes: manual, timed, and threshold. When measuring time is set, the system automatically starts synchronized with the instrument's clock. For threshold sound level measurement, the system must first activate the instrument and wait for completion. Once the measured sound level exceeds the threshold, the system automatically triggers measurement.

1.4.2 Standard Sound Level Meter

The main interface of this series of sound level meters can be used as a standard sound level meter, with the following primary measurement parameters:

- The sound level is measured by frequency weighting A and time weighting F.
- Measure the maximum sound level of frequency A-weighted and time-weighted F;
- The minimum sound level of the frequency A-weighted and time-weighted F was measured.

1.4.3 Average of Integral

This series of sound level meters features an integral average measurement mode, offering three frequency weighting options (A, C, Z) and three time weighting options (F, S, I). It enables operators to select appropriate frequency and time weighting for measurements. Key performance indicators include:

- The average time sound level (equivalent continuous sound level);
- 1s Short-term time average sound level (short-term equivalent continuous sound level);
- time-weighted sound level;
- Frequency C-weighted peak sound level;
- maximum time-weighted sound level;
- minimum time-weighted sound level;
- normalized 8-hour average sound level;
- Sound exposure level;
- sound exposure;
- noise dose (reference sound level 90 dB, reference duration 8 h, exchange rate 3 dB);

•Measure duration;

•Measure time used.

1.4.4 Statistical Analysis

This series of sound level meters features statistical analysis functionality in its measurement mode, where frequency weighting is limited to A-weighting and time weighting to F-weighting. Key measurement parameters include:

•Frequency A-weighted time average sound level (equivalent continuous sound level);

•1s Short-term frequency A-weighted time average sound level (short-term equivalent continuous sound level);

•Frequency A-weighted F time-weighted sound level;

•Frequency A weighting F time weighting maximum value;

•The minimum value of frequency A-weighted and F-time-weighted.

•Frequency A-weighted sound exposure level;

•Cumulative sound level percentage (statistical sound level) LN (default percentages N are 5, 10,50,90, and 95; users can also change them in settings, N=1~99);

•standard deviations ;

•Measure duration;

•Measure time used.

1.4.5 Parallel Measurement

This series of sound level meters adopts parallel measurement mode,
which includes three frequency weighting modes (A, C, Z) and three time weighting modes (F, S, I). The sound level is measured in parallel with both frequency and time weighting.
Main measurement indicators:

•Weighted sound level (Lp) for each time period;

•Maximum weighted sound level (Lmax) for each time period;

•The minimum value of the weighted sound level (Lmin) for each time period;

•The average sound level (LeqT, equivalent continuous sound level) for each time period;

•Lpeak (the weighted peak sound level) for each frequency

•level of exposure to sound (LE);

•Measure duration;

•Measure time used.

1.4.6 24-Hour Measurement

24 Hourly measurement mode (models with suffix A do not have this feature). In this mode, frequency weighting is only A-weighted, and time weighting is only F-weighted. Main measurement indicators:

•Lden, the equivalent sound level for daytime, evening, and nighttime.

•Day and night equivalent sound level(Ldn);

•daytime equivalent sound level (Ld);

•Evening equivalent sound level (Le);

•Night equivalent sound level (Ln);

•24 hours and hourly:

—— Frequency A-weighted time average sound level (equivalent continuous sound level);

—— 1s Short-term frequency A-weighted time average sound level (short-term equivalent continuous sound level);

—— Frequency A-weighted F time-weighted sound level;

—— Frequency A-weighted F time-weighted maximum sound level;

—— Frequency A-weighted F time-weighted minimum sound level;

—— Frequency A-weighted sound exposure level;

—— the sound level LN (N = 5, 10,50,90, and 95);

—— standard deviations SD

1.4.7 Room Noise

The measurement modes of sound level meters with suffixes D, E, and F include indoor noise measurement. In this mode, frequency weighting is only A-weighted, and time weighting is only F-weighted. The main measurement indicators are:

•31.5Hz frequency band sound pressure level values (unweighted), maximum and minimum;

•63Hz frequency band sound pressure level (unweighted), maximum value, minimum value;

•125Hz frequency band sound pressure level (unweighted), maximum value, minimum value;

•250Hz frequency band sound pressure level (unweighted), maximum value, minimum value;

•500Hz frequency band sound pressure level (unweighted), maximum value, minimum value;

•Frequency A weighted equivalent continuous sound level, maximum value, minimum value.

Mark with "*" when the measurement exceeds the limit.

1.4.8 1/1 OTC

The E and F suffix type sound level meters utilize a 1/1 octave measurement mode, featuring 111/1 octave filter center frequencies: 16 Hz, 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, and 16 kHz. This mode supports three frequency weighting methods (A, C, Z) and two time weighting methods (F, S), allowing operators to select appropriate frequency and time weighting parameters for measurements. Key measurement functions include:

•Time-averaged sound level (LeqT, equivalent continuous sound level) for each frequency band;

•Maximum weighted sound level (Lmax) for each frequency band;

•The minimum weighted sound level (Lmin) for each frequency band;

•A time average sound level, maximum and minimum values;

•C Weighted time average sound level, maximum and minimum values;

•Z-weighted time average sound level, maximum and minimum values.

1.4.9 1/3 OTC

The F-type sound level meter adopts a 1/3 octave measurement mode with 321/3 octave filter center frequencies: 16 Hz, 20 Hz, 25 Hz, 31.5 Hz, 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, 160 Hz, 200 Hz, 250 Hz, 315 Hz, 400 Hz, 500 Hz, 630 Hz, 800 Hz, 1 kHz, 1.25 kHz, 1.6 kHz, 2 kHz, 2.5 kHz, 3.15 kHz, 4 kHz, 5 kHz, 6.3 kHz, 8 kHz, 10 kHz, 12.5 kHz, 16 kHz, and 20 kHz. This mode supports three frequency weighting methods (A, C, Z) and two time weighting methods (F, S), enabling operators to select appropriate frequency and time weighting parameters. Key measurement functions include:

•Time-averaged sound level (LeqT, equivalent continuous sound level) for each frequency band;

•Maximum weighted sound level (Lmax) for each frequency band;

•The minimum weighted sound level (Lmin) for each frequency band;

•A time average sound level, maximum and minimum values;

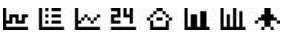
•C Weighted time average sound level, maximum and minimum values;

•Z-weighted time average sound level, maximum and minimum values.

1.5 Symbols and Definitions

The meanings of terms, symbols and abbreviations that may be used in this manual are shown in Table 2.

Table 2 List of Terms and Symbols

Nouns and Symbols	Define or describe
▲	Overload
▼	Deficit
▲	Upturning
▼	Flip down
◄	Left flip
►	Turn right
	External power supply
↓	Underrange of measurement
	Threshold start
	Timer start
	The History feature is enabled
	The recording feature is enabled
	The Record and History features are enabled
	Icon for measurement mode results file

Alt	Height
Band	Frequency band
Code	Environmental monitoring point
dB	Sound level measuring device
EX	X (A, C, Z) frequency-weighted sound exposure, e.g. EA
E_A	A Frequency-weighted Acoustic Exposure
Ec	C Frequency-weighted Acoustic Exposure
Ez	Z-frequency-weighted acoustic exposure
F	Standard Time Weighting for Sound Level Meter
I	Pulse time weighting
FreqWt	Frequency weighting
Lat	Latitude
Lav	Time weighted average sound level
Lc	Standard level
LXE or LE	X (A, C, Z) frequency-weighted sound exposure level, e.g. LAE
LXeqT or LeqT	X (A, C, Z) frequency-weighted equivalent continuous sound pressure level, for example LAeqT
LXeq1s	X (A, C, Z) frequency-weighted 1-second equivalent continuous sound pressure level, e.g. LAeq1s
LXeq8h	X (A, C, Z) frequency-weighted normalized 8-hour average sound level, e.g. LAeq8h
LXY or Lp	X (a, C, z) frequency-weighted sound level and Y (F, s, I) time-weighted sound level, such as LAF, LCZ, etc.
LXymax or Lmax	X (A, C, Z) frequency weighting and Y (F, S, I) time weighting

	The maximum sound level, e.g., LAFmax
LXymin or Lmin	The minimum sound level for X (A, C, Z) frequency weighting and Y (F, S, I) time weighting, e.g., LAFmin
LXpeak or Lpeak	X (A, C, Z) weighted peak sound level, e.g. LCpeak
LeqC-A or LC-A	The Difference Between C-weighted Average Sound Level and A-weighted Average Sound Level
Ld	Daytime equivalent sound level
Ldn	Day and night equivalent sound level
Lden	Day, evening and night equivalent sound level
Le	Equivalent sound level at night
Ln	Nocturnal equivalent sound level
Limit	Indicated Limits in the Indoor Noise Model
Lng	Length
LN	Cumulative percentage sound level (statistical sound level), n = 1 to 99. For example, L5 means 5% of the sound pressure levels exceed this value.
Lt	Threshold level
NDX	(A, C, Z) Weighted noise dose
Pa^2s or Pa^2h	A unit of sound exposure, measured in pascals per square second (Pa^2s) or pascals per square hour (Pa^2h), abbreviated as Pa^2s or Pa^2h when superscript notation is impractical.
Q	Exchange rate, range 3 to 6
Room	Room Type in the Mode of Indoor Noise Measurement
S	Slow time weighting
Sync	The flag displayed when the Synchronize feature is selected in the 24-hour measurement mode
SD	Standard

Tm	Actual measured running time
Ts	Measure start date and time
TWA	8 time-weighted average sound level
Vel	Velocity
INT	Integral average measurement result format
L5	The result of statistical analysis shows that 5% of the sound pressure level exceeds the standard.
L90	According to the statistical analysis, 90% of the sound press ure level exceeds the sound pressure level.
LAE	Frequency A-weighted sound exposure level
LAeqT	The equivalent continuous sound pressure level (ECSL), measured in decibels, is a metric that tracks the time-dependent average of the A-weighted sound pressure level during the measurement period.
LAeq1s	1s Equivalent Continuous Sound Pressure Level (ECSPL) measures the time-varying average A-weighted sound pressure level during measurement, expressed in dB.
LAF	Frequency A-weighted and time F-weighted sound level
LAFmax	Maximum sound level with frequency A weighting and time F weighting
LAFmin	Frequency A-weighted and F-time-weighted minimum sound level
LAI	A-weighted and impulse-weighted sound level
LAImax	Maximum sound level of frequency A weighting and pulse time weighting
LAImin	Minimum Sound Level of Frequency A Weighting and Pulse Time Weighting
LAS	Frequency A-weighted and S-time-weighted sound levels
LASmax	Maximum sound level with frequency A weighting and S time weighting
LASmin	Frequency A-weighted and S-time-weighted minimum sound level
LAT1S	Frequency A-weighted 1-second equivalent continuous sound pressure level
LCE	Frequency C-weighted sound exposure level

LCeqT	Equivalent continuous sound pressure level, measured in decibels, indicates the time-varying average of the C-weighted sound pressure level during the measurement period.
LCeq1s	1s Equivalent Continuous Sound Pressure Level (ECPSL) measures the time-dependent average of C-weighted sound pressure level (C-WPSL) during the measurement period, expressed in dB.
LCF	Frequency C-weighted and F-time-weighted sound level
LCFmax	Maximum sound level with C-weighting and F-time weighting
LCI	Frequency C-weighted and Pulse Time-weighted Sound Level
LCImax	Maximum sound level with frequency C weighting and pulse time weighting
LCpeak	Frequency C-weighted peak sound pressure level
LCS	Frequency C-weighted and S-time-weighted sound level
LCSmax	Maximum sound level with C-weighting frequency and S-weighting time
Ld	Daytime equivalent sound level
Ldn	Diurnal equivalent sound level
Lden	Diurnal equivalent sound level
LeqT	Equivalent continuous sound pressure level, measured in dB, represents the average sound pressure level over time during the measurement period.
Le	Equivalent sound level at night
LE	Noise exposure level
Ln	Nocturnal equivalent sound level
LN	Statistical analysis of noise levels, where N represents the percentage exceedance
LZE	Frequency Z-weighted sound exposure level
LZeqT	The equivalent continuous sound pressure level (ECSPL) is the average Z-weighted sound pressure level measured during the measurement period, expressed in dB.
LZeq1s	1s Equivalent Continuous Sound Pressure Level (ECPSL) is the frequency -weighted sound pressure measured during the measurement period.

	The average level over time, measured in dB.
LZF	Z-weighted frequency and F-weighted time sound level
LZFmax	Maximum sound level with Z-weighting and F-time weighting
LZFmin	Minimum sound level with Z-weighting and F-time weighting
LZI	Frequency Z-weighted and Pulse Time-weighted Sound Level
LZImax	Maximum sound level with frequency Z-weighting and pulse time weighting
LZImin	Minimum sound level with frequency Z-weighting and pulse time weighting
LZS	Z-weighted frequency and S-weighted time sound level
NDA	Frequency A weighted noise dose
NDC	Frequency C weighted noise dose
NDZ	Z-weighted noise dose
Rep	Repeated measure
Sync	Synchronous measurement (24-hour measurement)
SD	Standard
STA	Statistical Analysis Measurement Result Format
TimeWt	Time weight
Tm	Actual measured running time
Total	Abstract

2,Specifications and Technical Parameters

a) performance grade	Level 1 or Level 2 as specified in GB/T 3785.1-2010/ IEC 61672-1:2013.
b) Electromagnetic Field Radiation and Anti-jamming Classification	Class X as defined in GB/T 3785.1-2010 / IEC 61672-1:2013.

c) frequency weighting	A-weighting; C-weighting; Z-weighting; Low (low frequency). Note: When A-weighting is selected and low-frequency (√) weighting is also chosen, low-frequency A-weighting can be applied to measure secondary radiation noise. Low-frequency weighting is generally not required for measurements. Keep the "Weighting" option set to low-frequency (×) weighting in the settings.
d) time weighting	F (fast); S (slow); I (pulse).
e) frequency range	10 Hz~20 kHz (Level 1); 20 Hz~12.5 kHz (Level 2)
f) nominal operating mode	The nominal working mode is microphone without wind shield.
g) Reference environmental conditions	Air temperature: 23℃; relative humidity: 50%; Static pressure: 101.325 kPa;
h) Microphone type	A freefield frequency response measuring microphone with a nominal diameter of 127 mm and a nominal sound pressure sensitivity of 50 mV/Pa (the nominal sound pressure sensitivity level is At-26 dB (reference voltage 1 V), the microphone tip capacitance is approximately 15 pF.
i) indicator	A 128×128 dot matrix LCD display (3.0 inches) with 0.1 dB resolution and 1-second data refresh rate, featuring warning indicators for overload, low voltage, and battery under-voltage.
j) Measurement range at 1 kHz frequency	30 dB(A)~130 dB (A)；40 dB(C)~130 dB (C)；45 dB (Z)~130 dB (Z) Note: (1) The measurement range for other frequencies shall be the sum of the upper and lower limits of the instrument's measurement range and the frequency-weighted nominal values specified in the national standard GB/T 3785.1-2010, provided that the upper limit shall not exceed the measurement range of 1 kHz. Both the upper and lower limits shall be no less than the lower limit of the 1 kHz measurement range. (2) The measurement range can be customized to other non-standard ranges based on user requirements.
k) octave	1) 1/1 octave:

	16 Hz, 31 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, and 16 kHz; 2) 1/3 octave: 16 Hz, 20 Hz, 25 Hz, 31 Hz, 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, 160 Hz, 200 Hz, 250 Hz, 315 Hz, 400 Hz, 500 Hz, 630 Hz, 800 Hz, 1 kHz, 1.25 kHz, 1.6 Hz, 2 kHz, 2.5 kHz, 3.15 kHz, 4 kHz, 5 kHz, 6.3 kHz, 8 kHz, 10 kHz, 12.5 kHz, 16 kHz, and 20 kHz.
L) memory	1) 16GB of RAM. 2) Calibration records are automatically saved in the instrument's memory. 3) The measurement records are automatically stored in the instrument's memory. 4) Select USB in Settings to use it as a USB drive.
m) source	1) It was powered by 5 AA batteries. 2) When the battery voltage is too low, the battery icon on the display will turn blank and start blinking. 3) Supports external power supply via USB port (5.0V). 4) When operating in 24-hour measurement mode, use a power bank for charging. Note: Explosion-proof products require LR6 alkaline batteries only.
n) power bank	For extended or 24-hour measurements, a power bank is recommended, with a 10000mAh battery providing over 36 hours of operation.

o) Auto calibration range	±4.5dB (reference sensitivity of 50mV/Pa).
p) Calibration check frequency	1 kHz.
q) The effect of windproof cover	The deviation must not exceed 0.5 dB within the critical frequency range.
r) reference direction	Frontal incidence (0° incidence).
s) reference sound pressure level	94 dB, with a reference sound pressure of 20 μ Pa.
t) preheating time	60 s.
u) intrinsic noise level	1) Under reference environmental conditions, the self-generated noise level does not exceed 25 dB (A-weighted) and 35 dB (C-weighted). 2) The expected value of the self-generated noise level of the sound level meter is not greater than the above value when the electrical input of the sound level meter is short-circuited by a 15 pF capacitor.
V) temperature affect	The difference between the sound level at any temperature and the sound level at the reference temperature shall not exceed ±0.7 dB for Class 1 sound level meter and ± 1.0 dB for Class 2 sound level meter in the working temperature range of 0℃~40℃.
w) humidity effect	When the relative humidity changes from 25% to 90%, the difference between the indicated sound level and the reference sound level at the corresponding relative humidity should not exceed ±0.7 dB for Class 1 sound level meters and ±1.0 dB for Class 2 sound level meters.
x) temperature and humidity limits	Temperature: -20℃ and +60℃; relative humidity: 95%.
y) Adjustment data of sound pressure response and free field response	The equivalent free field response can be obtained by adjusting the data in Table 1, based on the acoustic pressure response generated by the acoustic calibrator or the simulated acoustic pressure response produced by the electrostatic exciter.
z) Test the impedance of the microphone replacement (for testing)	15 pF in series with 10 Ω .
Aa) The maximum sound pressure level that can be applied to the microphone	146 dB。

Bb) Th maximu peak-to-peak voltage that can be applied to the electrical input terminal	15 V。
Cc) output port	Type-C is used for printing or data communication.
Dd) analog output	1) The output jack is a 3.5mm dual-channel headphone jack. 2) The DC output is about 15mV/dB, and the range is 450mV to 1950mV. 3) AC output: The output is linearly proportional to the measured signal, with the root mean square value of the maximum AC output voltage not exceeding 2V.
Ee) outline dimension	Dimensions (length × width × thickness) 270mm×90mm×32mm.
Ff) weight	360g (no including battery).

Table 1 Free-Field Response Adjustment Data

Frequency /kHz	Free field increment/dB		Frequency /kHz	Free field increment/dB
1	0.2		6.3	2.2
1.25	0.3		8	3.4
1.6	0.4		10	5.0
2	0.5		12.5	6.2
2.5	0.7		16	7.6
3.15	0.9		18	8.4
4	1.3		20	9.0
5	1.8		—	—

3,Main Structure and Working Principle

The series of sound level meter is composed of microphone, preamplifier, conditioning circuit, single chip circuit, power supply circuit, display circuit and button circuit, and it is equipped with power supply, battery status monitoring, overload indication, limit indication and threshold alarm, analog output and digital output circuit.

This series of sound level meters utilizes pre-polarized back-capacitive measuring microphones that require no external bias voltage. As the acoustic-electrical conversion element, the microphone transforms measured noise signals into corresponding electrical outputs while converting high-impedance signals to low-impedance signals for subsequent circuit processing. The conditioning circuit optimizes the preamplifier output before transmitting it to a 24-bit analog-to-digital converter (ADC). The microcontroller unit (MCU) controls the ADC, processes the digital output through frequency weighting, time weighting, detection, and logarithmic conversion, and ultimately sends the results to the display circuit for visual representation.

The measurement result is displayed directly on the LCD screen, and the display screen can show the battery voltage low, overload and over limit sign, LCD screen has the advantages of large display area, high contrast, not afraid of strong light fading, not easy to cause visual fatigue, etc.

When the measured signal exceeds the upper limit and the sound level meter is overloaded, the overload indicator appears in the middle-right corner of the LCD screen.⮝; When the measured signal falls below the lower limit, the LCD screen displays a 'Underload' indicator in the right middle area⮟"。

This series of sound level meters is battery-powered. To meet the internal circuitry's reference voltage requirements, the device features a ±5V reference power supply. The built-in battery status monitoring circuit provides real-time battery condition monitoring. A battery icon is displayed in the lower left corner of the screen. When the battery level drops below the preset threshold, the icon automatically turns off and starts flashing to indicate low power.

4,Use and Operation

4.1 The Function of Each Control Element

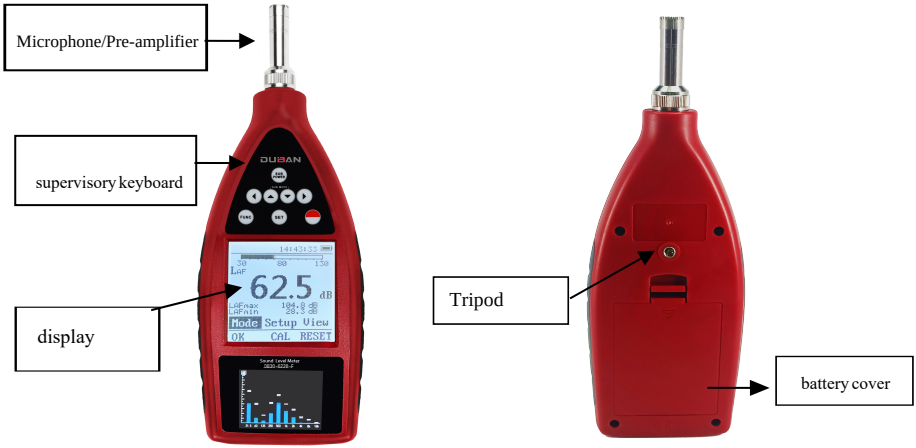


Figure 3 General Schematic Diagram

The control device of this series of sound level meters, as shown in Figure 3, has the following functions:

1) Microphone: 12.7 mm pre-polarized condenser microphone. Note: Do not remove the protective cover.

2) Pre-amplifier: For impedance matching, it must be installed immediately after the microphone and is non-removable.

Display: 128×128 dot matrix LCD with 0.1 dB resolution, showing battery voltage status, overload, and undervoltage simultaneously.

3) Button: Conductive rubber button for turning on/off, measuring, and displaying.

4) Battery cover: Press down the snap-on battery cover for easy battery replacement.

5) Tripod mounting hole: 1/4 inch threaded hole for mounting the sound level meter on the tripod.

4.2 Instrument Output Interface

The instrument's output interfaces are visible at the bottom of the secondary screen, as shown in Figure 4: The 3.5 mm dual-channel headphone jack serves as the AC/DC output interface, while the TYPE-C port offers two optional functions:

1. USB-powered RS232 interface compatible with wired mini printers;
2. USB-powered online TF card data reading capability with optional Bluetooth mini printer integration.

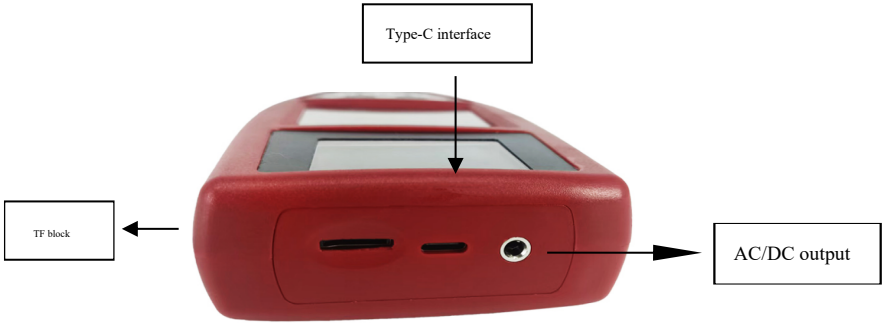


Figure 4 Schematic of the Output Interface

4.3 Replace the Battery

The sound level meter is powered by five AA (5V) batteries, with the battery compartment located on the back of the device. When installing or replacing batteries, push the battery cover to the right in the direction indicated by the arrow. AA batteries must be inserted correctly according to the polarity marked on the packaging box. Never insert them in reverse!

If the display shows a blank battery voltage symbol with a flashing indicator in the lower left corner, this indicates the battery voltage has dropped below the specified operating level. Replace the battery promptly. While the device may continue to function normally, immediate replacement is recommended to prevent potential measurement errors.

pay attention to：

1、 When replacing the battery, ensure the noise level meter is turned off.

2、 Do not mix new and old batteries;

3、 When the battery is completely drained,
the audio indicator stops functioning and fails to display battery warning signals.

4、 Waste batteries should be disposed of at designated recycling points to prevent environmental poll ution.

Warning: Do not dispose of used batteries in fire to avoid explosion!

The schematic diagram of the button is shown in Figure 5.

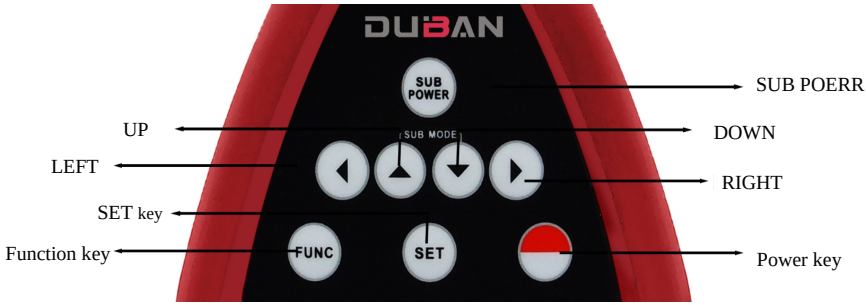


Figure 5 Schematic Diagram of Key Layout

4.4 Push-Button

Button Function Description:

Function key: This key has different functions in different interfaces and is used as the OK, Start, Pause, Modify, Calibrate, Print, and Yes keys.

Set key: This key has different functions in different interfaces and is used as the "Calibrate, Set" key.

Left arrow key: Functions as "left shift, left advance, and left page turn".

Down arrow key: Shift + Page Down, used to reduce and select values in the parameter settings interface.

Right arrow key: Shift-right, Shift-right advance, and Page-right, and also deletes items in the browsing interface.

Up arrow key: Function 'value increment and selection' in the parameter setting interface, used as 'Shift up, page up'.

SUB function key: Press the up and down keys simultaneously to toggle the secondary screen display.

Power button: Long press to turn the device on or off (power-off must be performed from the main interface). It can also serve as a function key, with different interfaces providing distinct functions such as reset, return, exit, stop, and cancel.

4.5 calibration

This series of sound level meters can be calibrated using various acoustic calibrators. The calibration covers the entire unit, including the microphone. We recommend using dual-level acoustic calibrators or other models with 94 dB, 1 kHz output signals.

The calibration procedure using a sound level calibrator is as follows:

a) Install the battery as described in Section 4.3, or connect it directly to the USB port for external power.

b) Press and hold the power button to power on and access the main interface, as shown in Figure 6.

c) Preheat for 60 seconds.

d) Press the Calibrate key (Function Key 2) to enter the calibration interface.

e) Based on the calibrator's sound level and operating frequency, adjust the "Calibration Level" and "Free Field Correction" values. Use the left/right arrow keys to navigate to the modified numbers, then press the up/down arrow keys. After adjusting the values, press the "Calibrate" key (Function Key 1) to initiate calibration. The remaining calibration time will be displayed in the center of the screen.

f) After calibration is complete, the LAF displays the calibrated sound level with 'Successful' at the bottom of the screen. If 'Too High', 'Too Low', or 'Unstable' appears, the calibration failed. Check the sound calibrator or calibration level settings for errors. Confirm correct settings and press the 'Calibrate' key (Function Key 1) to proceed.

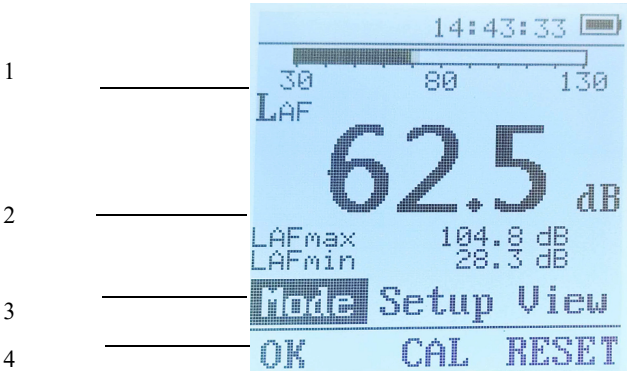


Figure 6

Main Interface Description:

1-Information area, displaying instrument model and battery label.

2-The measurement area displays the measured sound level parameters, values, and units.

3-Menu item area, three submenus, select with the "left/right arrow" keys, then press "Enter" to confirm.

4-Function Key Area: The three function keys on the panel's top correspond to their respective buttons. The leftmost' Function Key 'confirms settings, the middle' Settings ' calibrates, and the' Power Key' resets (short or long press to power off).

g) After calibration is completed, press the power button (return key) to exit the calibration interface, turn off the sound calibrator, and remove it. At this point, the sound level meter is calibrated.

pay attention to：

1、 When using other types of acoustic calibrators, please refer to the corresponding product manuals. This product is not suitable for calibrating piston-type probes.

2. When calibrating, ensure the sound calibrator is tightly coupled to the microphone.

3、 During calibration, the background noise must be at least 20 dB below the output sound pressure level of the acoustic calibrator; otherwise, calibration must be performed according to the instructions provided by the acoustic calibrator.

4、 When background noise is high, the sound level meter should be calibrated at 114 dB.

Although this series of sound level meters is highly stable and only requires periodic adjustments, it is still recommended to perform a calibration check before and after each measurement.

4.6 Main Interface Settings

In the main interface, hover over the 'Settings' option and press the OK key (function key) to access the settings. Here, you can adjust parameters like clock, recording, brightness, and baud rate, view 'Memory' and 'About the Instrument' information, and choose whether to enable automatic printing and USB input functions.

To activate the USB function, position the cursor at the USB option and press OK to enter. Then, at the U disk (-) option, press OK again to switch to U disk mode. Connect the device to your computer via a USB cable, and all measurement data from the SD card will be displayed on the computer.

Modify "LCD (Brightness)". Use the up/down arrow keys to move the cursor to the "LCD" item, then press OK to proceed. The brightness can be set from 0 to 9 (10 levels). Select "5" as the recommended brightness. Adjust the brightness value using the up/down arrow keys, then press OK to save and return, or press BACK (power button) to return without saving.

To modify the clock, place the cursor at the date & time position and press OK to enter the clock settings interface. Use the left/right arrow keys to move the cursor and the up/down arrow keys to adjust the value. After making changes, press OK to save and return, or press BACK (power button) to exit without saving.

To adjust recording settings, position the cursor at the recorder icon. Press OK to open the settings interface, then use the left/right arrow keys to move the cursor and the up/down arrow keys to adjust values. After completing the changes, click Save to save and exit, or press Return (power button) to exit without saving. Note: Select the left channel during recording. The generated file is in WAV format (left channel, measurement range 30dB~115dB). The device cannot play the recording directly; you must transfer (or copy) the file to a computer for playback.

After selecting the "Printer" option, the cursor will move to the printer position. Press Enter to enter the print settings interface, use the left/right arrow keys to move the cursor, and adjust numerical parameters with the up/down arrow keys. Click Save to save and return. If you choose the "Auto (√)" mode, connect the printer before measurement. The system will automatically complete printing after measurement without any manual operation.

Note: 1) The printer's baud rate is typically set to 9600. For higher baud rates, refer to the printer manual.

Search for "Storage", move the cursor to "Storage", and click "OK" to enter the memory interface. This interface has two submenus: "SD Card Information" and "Clear Data". Be cautious when entering "Clear Data".

The query for 'About the Instrument' follows the same procedure as above, listing the instrument's' model, version, power supply voltage, and serial number'.

4.7 Pattern

In the main interface, hover over the 'Mode' option and press the OK key (function key) to access the measurement mode interface. Seven modes are available: 'Integral Average', ' Statistical Analysis', '24-Hour Measurement', 'Parallel Measurement', 'Indoor Noise', '1/1 octave', and '1/3 octave'. Note that configurations vary by model, as detailed in Table 1.

4.8 Glance Over

In the main interface, hover over the "View" option and press the "OK" key (function key) to access the data browsing interface. The instrument categorizes data by year, month, and day. Each measurement group's name consists of "Measurement Start Time · Mode Code". For example: "124208.INT" indicates integrated average measurements starting at 12:42:08; "STA" stands for "Statistical Analysis"; "24H" refers to "24-hour measurements"; "PAR" denotes "Parallel"; "IND" represents "Indoor Noise"; "OCT" indicates "1/1 octave"; and "3RD" signifies "1/3 octave".

4.9 Measure

4.9.1 Standard Sound Level Meter

The main interface of this series of sound level meters features standard sound level meter functions, capable of measuring LAF, LAFmax, and LAFmin. To reset the maximum and minimum sound levels, press the power button (reset button).

4.9.2 Average of Integral

4.9.2.1 Settings in the Average Mode

In the integral average interface, press the "Settings" key (Settings key) to enter the integral average parameter settings interface. Main

To configure parameters including measurement point code (Cite code), integration time (preset time, weight, repeat, LN percentage, and startup method), follow these steps: 1. Use the up/down arrow keys to navigate to the desired parameter. 2. Press the "Modify" key (function key) to open the editing interface. 3. Use the left/right arrow keys to move the cursor. 4. Adjust values or methods using the up/down arrow keys. 5. Press the "OK" key (function key) to save and exit.

pay attention to：

1. If the Preset Time is set to 00:00, the integration time is set to Manual.

2. After completing the startup mode settings for the Start Mode item, the corresponding mark will appear in the lower left corner of the Score Average interface. The mark is set to Threshold, RTC timer, or Manual, no tags. It will start simultaneously.Set the mode to "Threshold" and click the "Start" button in the Integral Average interface to launch.

3、 When the option 'low (√)' is selected during weighting, the system will switch to low-frequency measurement (16Hz~200Hz) to measure secondary radiation noise.

4.9.2.2 Average of Integral

The steps of integral average measurement are as follows:

a) Open and calibrate according to method 4.5.

b) Select the 'Mode' option, press OK to enter measurement mode, then choose 'Integral average' and press OK to access the integral average measurement interface.

c) Set the parameters of "measurement point code, integration time, weighting, repeat measurement, and start mode" according to 4.9.2.1. If no adjustment is made, select "A" weighting for frequency and "F" weighting for time. If the measurement noise changes rapidly, select "S" weighting for time.

d) Press the "start" button to begin measurement. During the process, press the "up/down arrow " keys to view parameters including equivalent continuous sound level, time-weighted instantaneous sound level, C-weighted peak sound level, 1-second equivalent continuous sound level, maximum time-weighted sound level, minimum time-weighted sound level, standardized 8-hour average sound level, sound exposure level, and noise dose. The measurement duration and actual operating time are also displayed.

e）If the overload symbol is displayed in the middle of the right side of the screen⮝", indicating that the measured sound level has exceeded the upper limit of the sound level measurement range. If the display shows a mark below the limit in the middle of the right side," ⮟This indicates that the measured sound level is below the lower limit of the sound level meter's measurement range.

f） When the integration time expires, the sound level meter automatically or manually stops measurement and switches to the display interface, where users can view or print the results.

g) Press the Return key (power button) to return to the integrated average interface and perform the next measurement.

h) After the measurement is completed, return to the main interface and check the sensitivity with a sound level meter calibrator to ensure the accuracy and reliability of the measurement data.

i) shut down 。

pay attention to：

1. When the 'repeated measurement' setting is configured for 2 or more total measurements, the sound level meter will automatically perform the next measurement after completing the current one.

2、 When the sound level meter is not in use for an extended period, the battery must be removed to prevent battery leakage from damaging the instrument.

3. To shut down, exit to the main interface and press and hold the power button.

4.9.3 Statistical Analysis

4.9.3.1 Settings in Statistical Analysis Mode

In the statistical analysis interface, press the "Settings" key (Function Key 2) to access the configuration panel. This section primarily includes parameter settings such as measurement point coding, integration time, statistical sound level, repeated measurements, startup mode, and historical records. The detailed steps are as follows: Use the "Up/Down Arrow Keys" to navigate to the desired settings, press the "OK" key (Function Key 1) to confirm, then use the "Left/Right Arrow Keys" to adjust the cursor position and modify values or methods with the "Up/Down Arrow Keys." After completing the settings, click the "Save" key (Function Key 1) to save the configuration and return to the main interface.

pay attention to：

1. Set the preset time to 00:00:00, which means the clock time is set to "99:59:59".

2. After completing the startup mode settings in the Startup Mode section, the corresponding mark will appear in the lower left corner of the average points interface. The mark is set to Threshold, RTC, or Manual. and unmarked states. Additionally, in the measurement interface, you must press the 'start' button to activate the device.

4.9.3.2 Statistical Analysis Technique

The statistical analysis and measurement procedures are as follows:

a) Enable and calibrate according to Method 4.5.

b) Select the "Mode" option, press the "OK" key (function key) to enter measurement mode, then select "Statistic" and press "OK" to access the statistical analysis interface.

c) Set the parameters such as measurement point code, integration time, statistical sound level, repeated measurement, starting mode, and history according to the method 4.9.3.1.

d) Press the "Start" button to begin the measurement. During the measurement, press the "↑/↓" keys to view the measured values of LAeqT, LAF, LAeq1s, LAFmax, LAFmin, LAE, SD, LN, and Tm.

e) The overload symbol appears in the middle of the right side of the display."⮝", indicating that the measured sound level has exceeded the upper limit of the sound level measurement range. If the display shows a mark below the limit in the middle of the right side,"⮟This indicates that the measured sound level is below the lower limit of the sound level meter's measurement range.

f) When the integration time expires, the sound level meter automatically or manually stops measurement and switches to the display interface, where users can view or print the results.

g) Press the BACK key (power button) to return to the statistical analysis interface and proceed with the next measurement.

h) After the measurement is completed, return to the main interface and use the sound level meter calibrator to check the sensitivity to ensure the accuracy and reliability of the measurement data.

i) close 。

Note: The statistical analysis pattern has only A frequency weighting and F time weighting.

4.9.4 24h Pattern

4.9.4.1 24 Hour Mode Settings

In the 24-hour measurement interface, press the "Settings" key to enter the statistical analysis settings interface. The main parameter settings include "measurement point encoding, integration time, statistical sound level, synchronization, startup mode, history, and mode." The specific operation steps are as follows: Use the "up and down arrow keys" to move to the required repair.

For modified items, press the OK key (function key) to enter the settings interface. Use the left/ right arrow keys to move the cursor, and the up/down arrow keys to adjust values or method parameters. After completing the settings, press the Save key (function key 1) to save and return to the main interface.

pay attention to：

1. If the preset time is set to 00:00:00 or more than 1 hour, it will be limited to 1 hour.

2. "Sync" means that the start time of each subsequent measurement after the first measurement is at the hour mark. "Asynch" means that the minute and second of each subsequent measurement is the same as the minute and second of the first measurement.

4.9.4.2 24h Mode Measurement

24 The hourly measurement steps are as follows:

a) Enable and calibrate according to Method 4.5.

b) Select the 'Mode' option, press OK to enter measurement mode, select '24 hours', then press OK to access the 24-hour measurement interface.

c) Set parameters such as "measurement point code, integration time, statistical sound level, synchronization, start mode, history and mode" according to 4.9.4.1 method.

d) Press the "start" button to begin the first set of measurements. During the measurement process, press the "Up/Down arrow" button to view LAeqT, LAF, LAeq 1s, LAFmax, LAFmin, LAE, SD, LN, and Tm.

the measured value.

e) The right middle end displays the overload symbol. "▲", indicates that the measured sound level has exceeded the upper limit of the sound level measurement range. If the right middle display shows below the limit mark" ▼This indicates that the measured sound level is below the lower limit of the sound level measurement range.

f) When the integration time reaches the automatic completion of the first measurement set, the sound level meter enters the 24-hour measurement results interface, where the first set of measurement results can be viewed.

g) When the second set of measurement time ends, the instrument automatically starts the second set of measurements.

h) After completing 24 sets of measurements, you can view and print them in the measurement results interface.

i) Press the power button to return to the 24-hour measurement interface and proceed with the next measurement.

j) After the measurement is completed, return to the main interface. It is recommended to calibrate the sensitivity of the sound level meter using a sound level calibrator to ensure the accuracy and reliability of the measurement data.

k) shut down 。

Note: When measuring for extended periods, use the charger to prevent measurement interruptions caused by low battery power.

4.9.5 Parallel Mode

4.9.5.1 Settings in Parallel Mode

In the parallel measurement interface, press the "Settings" key to access the parameter configuration screen. Key parameters include measurement point encoding, integration time, repeat measurement, startup mode, and historical records. The procedure is as follows: First, use the "Up/Down Arrow" keys to select the item you want to modify, then press "OK" (function key) to confirm. Use the "Left/Right Arrow" keys to move the cursor, and adjust values or methods with the "Up/Down Arrow" keys. After completing the settings, press "Save" (function key) to save and return to the main interface.

4.9.5.2 Parallel Mode Measurement

The parallel measurement steps are as follows:

a) Enable and calibrate according to Method 4.5.

b) Select the "Mode" option, press the "OK" key (function key) to enter measurement mode, select "Parallel", and press "OK" to enter the parallel measurement interface.

c) Set parameters according to 4.9.5.1 methods, such as "test point code, integration time, repeated measurement, starting mode, and history".

d) Press the "start" key to begin the measurement. During the process, use the "up/down arrow" keys to view the time-weighted instantaneous sound level, maximum instantaneous sound level, minimum instantaneous sound level, equivalent continuous sound level, peak sound level, sound exposure level, measurement duration, and elapsed time.

e) When the integration time expires, the sound level meter automatically or manually stops the measurement. It then displays the results, allowing you to view or print them.

f) Press the BACK key (power button) to return to the parallel measurement interface and proceed with the next measurement.

h) After the measurement is completed, return to the main interface and use the sound level meter calibrator to check the sensitivity to ensure the accuracy and reliability of the measurement data.

g) close 。

4.9.6 Indoor Noise Pattern

4.9.6.1 Settings in Indoor Mode

To access the indoor noise measurement settings interface, press the "Settings" button. This interface includes key parameters such as measurement point encoding, integration time, room type, repeat measurement, startup mode, and historical records. The procedure is as follows: First, press the "Up/Down Arrow" keys to select the item you want to modify, then press the "OK" key (function key) to enter the settings interface. Use the "Left/Right Arrow" keys to move the cursor, and adjust values or modify methods using the "Up/Down Arrow" keys. After completing the settings, click the "Save" key (function key) to save the changes and return to the main interface.

4.9.6.2 Indoor Noise Measurement

The steps for indoor noise measurement are as follows:

a) Enable and calibrate according to Method 4.5.

b) Select the 'Mode' option, press OK to enter measurement mode, then select 'Indoor Noise' and press OK to access the indoor noise measurement interface.

c) Set the parameters "Measurement Point Code, Integration Time, Room Type, Repeat Measurement, Start Mode, and History" according to method 4.9.6.1.

d) Press the "start" button to begin the measurement. During the process, use the "Up/Down Arrow" keys to view the sound pressure levels, maximum and minimum values, and A-weighted sound levels for the 31.5Hz, 63Hz, 125Hz, 250Hz, and 500Hz frequency bands.

Maximum value, minimum value and Tm measurement.

e) When the integration time expires, the sound level meter automatically or manually stops the measurement, then displays the results on the interface where you can view or print the data.

f) Press the BACK key (power button) to return to the indoor noise measurement interface for the next measurement.

g) After the measurement is completed, return to the main interface. It is recommended to use a sound level calibrator to check the sensitivity of the sound level meter to ensure the accuracy and reliability of the measurement data.

h) shut down 。

4.9.7 1/1 OTC Octave

4.9.7.1 1/1 Settings in OTC Octave Mode

Press the SETUP key in the octave interface to enter octave settings.

The steps are as follows: Use the ↑/↓ keys to navigate to the item you want to modify, press OK to enter, use the ←/→ keys to move the cursor, and adjust the value or method with the ↑/↓ keys. After completing the settings, press Save to save and return.

4.9.7.2 1/1 Octave

1/1 The octave measurement procedure is as follows:

a) Open and calibrate according to method 4.5.

b) Select the 'Mode' option, press OK to enter measurement mode, then select '1/1 octave' and press OK to open the 1/1 octave measurement interface.

c) According to method 4.9.7.1, set parameters such as "measurement point code, integration time, weighting, repeated measurement, starting mode, and history". If no adjustment is made, select "A" weighting for frequency weighting and "F" weighting for time weighting. If the measurement noise changes rapidly, "S" weighting can be selected for time weighting.

d) Press the "start" key to begin the measurement. During the measurement, press the "↑/↓ arrow keys" to view 11 frequency bands (16

Hz, 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, and 16 kHz) and their corresponding continuous sound levels, maximum values, minimum values, and Tm measurements under A, C, and Z weighting.

e) When the integration time expires, the sound level meter automatically or manually stops the measurement, then displays the results on the interface where you can view or print the data.

f) Press the BACK key (power button) to return to the 1/1 octave measurement interface and proceed with the next measurement.

g) After the measurement is completed, return to the main interface. It is recommended to use a sound level calibrator to check the sensitivity of the sound level meter to ensure the accuracy and reliability of the measurement data.

4.9.8 1/3 OTC Octave Mode

4.9.8.1 1/3 OTC Octave Mode Settings

To access the 1/3 octave interface, press the SETUP key (Function Key 2). This interface allows configuration of key parameters including measurement point encoding, integration time, weighting coefficients, repeat measurements, modes, and historical records. The procedure is as follows: First, press the up/down arrow keys to select the desired modification. Confirm the entry by pressing OK (Function Key 1). Use the left/right arrow keys to move the cursor, and adjust values or method parameters via the up/down arrow keys. After completing the settings, press Save (Function Key 1) to save and return.

4.9.8.2 1/3 Octave

The frequency measurement procedure for a 1/3 octave interval is as follows:

a) Enable and calibrate according to Method 4.5.

b) Select the "Mode" option, press OK (Function Key 1) to enter measurement mode, select "1/3 octave", then press OK to access the 1/3 octave measurement interface.

c) Set the parameters for "measurement point code, integration time, weighting, repeat measurement, start mode, and history" according to method 4.9.8.1. If no adjustment is needed, select "A" weighting for frequency and "F" weighting for time.

Weighting. If the measurement noise changes rapidly, select "S" weighting for time weighting.

d) Press the "Start" button to begin the measurement. During the process, press the "Up/ Down Arrow" keys to view 32 frequency bands (16 Hz, 20 Hz, 25 Hz, 31.5 Hz, 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, 160 Hz, 200 Hz, 250 Hz, 315 Hz, 400 Hz, 500 Hz, 630 Hz, 800 Hz, 1 kHz, 1.25 kHz, 1.6 kHz, 2 kHz, 2.5 kHz, 3.15 kHz, 4 kHz, 5 kHz, 6.3 kHz, 8 kHz, 10 kHz, 12.5 kHz, 16 kHz, and 20 kHz) along with their corresponding continuous sound levels, maximum values, minimum values, and Tm measurements (using the A, C, and Z weighting methods).

e) When the integration time expires, the sound level meter automatically or manually stops the measurement, then displays the results on the interface where you can view or print the data.

f) Press the BACK key (power button) to return to the 1/3 octave measurement interface and proceed with the next measurement.

g) After the measurement is completed, return to the main interface. It is recommended to calibrate the sensitivity of the sound level meter using a sound level calibrator to ensure the accuracy and reliability of the measurement data.

4.9.9 Print Measurement Data

4.9.9.1 Micro Printer and Its Application

The sound level meter in this series can be optionally equipped with a micro printer with serial interface for printing the measurement results.

1、 User manuals for different printer batches may vary. Please refer to the printer manual.

2、 If the printer is not used for a long time or does not work properly, turn off the power.

3、 Use a charger that meets the requirements.

4、 When connecting a printer to a computer, first connect the data cable, then the printer power cable.

5、 Thermosensitive paper has two sides. Printing is only allowed on the front side.

6、 When the print is unclear, gently wipe the surface of the heating element of the print head chip with a cotton ball dipped in a small amount of alcohol.

7、 Do not open the paper tray cover while printing, as it may cause the printer to malfunction.

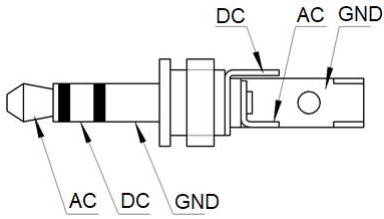
4.9.9.2 Print measurement data

4.10 Analog Output and Wiring

This series of sound level meters features both AC and DC voltage output signals. For easy volume adjustment, the AC and DC outputs share a single 3.5mm dual-channel jack. External devices (e.g., digital multimeters, audio equipment) can be connected to the sound level meter's output port using the included 3.5mm plug. Users must connect the output line correctly according to the required voltage type during operation.

The DC output voltage is about 15mV/dB, and the range is 450mV~1950mV.

AC output: The output is linearly proportional to the measured signal, with the root mean square value of the maximum AC output voltage not exceeding 2V.



simulation output plug wiring diagram

V. Complete Sets of Products

5.1 Main Attachments and Their Purposes

(1) hurricane globe

When conducting outdoor measurements or when wind speeds exceed 5.5 m/s, a wind shield should be used to minimize wind noise. The shield is made of porous foam plastic and simply covers the microphone during use. It also protects the microphone from dust, mud, and rain. Therefore, it is recommended to use a wind shield outdoors or in dusty areas.

(2) Output plug

Used to connect the analog output signal of the sound level meter with external instruments.

(3) Type-C data cable

It is used to communicate the digital output signal of sound level meter with PC application.

5.2 Accessory options and their purposes

(1) acoustic calibrator

The sound level calibrator is used to calibrate the sound level meter. The 2nd grade sound level meter should be calibrated with a 2nd grade or 1st grade sound calibrator.

1 The sound level meter is calibrated by the sound level calibrator of grade 1.

(2) electrical signal adapter and coaxial connection cable

When adjusting and calibrating with electrical signals, use an electrical signal adapter and coaxial cable to connect the sound level meter to the signal source.

5.3 Product Complete Set Table Note: Accessories for each sound level meter shall be based on the delivery list

Class	Name	Ts	Quantity	Remarks
Standard configuration	Sound level meter host		1	
	Measuring microphone		1	
	Hurricane globe		1	
	Power line	Type-C	1	
	Packing box		1	
	Instructions		1	
	Work certificate		1	
Optional accessories	Power adapter			
	Electrical signal adapter			
	Acoustic calibrator			
	Tripod			
	Extension cable			
	Printer			
	Output plug			

	Bluetooth			
	Power bank			
	USB cable + software			

VI. Instrument Maintenance

6.1 General Precautions

To prevent sound level meters from being damaged due to improper use or operation, the following instructions are provided:

(1) After use, remove the battery to prevent liquid leakage that may damage the instrument.

(2) Sound level meters should be stored in a dry place.

(3) Always turn off the power before loading or unloading microphones, extension cords, batteries, or external power sources.

(4) Do not remove the microphone cover to avoid damaging the diaphragm.

(5) Avoid touching the input contacts with your hands to prevent damage to the sound level meter caused by static electricity.

(6) Avoid prolonged exposure of liquid crystal displays (LCDs) to intense ultraviolet radiation to prevent aging.

6.2 Regular Verification

To ensure the accuracy and reliability of the measurement results, the sound level meter should be checked and calibrated annually.