

ICS 17.140.99
CCS A 59

JJG

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

JJG 2017-2005

Replacing JJG 2017-1987

**Verification scheme of measuring instruments for underwater
sound pressure
(English Translation)**

Issued on: April 28, 2005

Implemented on: October 28, 2005

**Issued by: The General Administration of Quality Supervision, Inspection
and Quarantine issued, The verification system was approved by the
General Administration of Quality Supervision, Inspection and
Quarantine on April 28, 2005.**

Table of Contents

1	Scope (1)
2	Underwater sound pressure measurement reference equipment (1)
2.1	Low-frequency underwater sound pressure reference device (1)
2.2	Free-field reciprocal method underwater acoustic pressure reference device (intermediate frequency) (1)
2.3	High-frequency underwater sound pressure reference device (2)
2.4	The main way of water sound pressure transmission from the basic amount of the amount of transmission (2)
3	Underwater sound pressure measurement standard device (2)
3.1	Low-frequency underwater sound pressure measurement standard device (2)
3.2	Medium frequency water sound pressure measurement standard device (2)
3.3	High-frequency underwater sound pressure measurement standard device (3)
3.4	The best measurement capability of hydroacoustic sound pressure standard and quantity transfer (3)
4	Underwater sound pressure working measuring instruments (4)
4.1	Measuring hydrophones (precision) (4)
4.2	Measuring hydrophones, transmitting transducers and underwater acoustic pressure measuring equipment (4)
5	Water sound pressure measurement instrument verification system table block diagram (5)

2.1 Low-frequency underwater sound pressure reference device (1)

2.2 Free-field reciprocal method underwater acoustic pressure reference device (intermediate frequency) (1)

2.3 High-frequency underwater sound pressure reference device (2)

2.4 The main way of water sound pressure transmission from the basic amount of the amount of transmission (2)

3.3 High-frequency underwater sound pressure measurement standard device (3)

3.4 The best measurement capability of hydroacoustic sound pressure standard and quantity transfer (3)

4.1 Measuring hydrophones (precision) (4)

4.2 Measuring hydrophones, transmitting transducers and underwater acoustic pressure measuring equipment (4)

5 Water sound pressure measurement instrument verification system table block diagram (5)

Hydroacoustic sound pressure measuring instrument verification system table

1 Scope

This verification system table is applicable to the transmission of the magnitude of the underwater acoustic pressure measuring instrument in the frequency range of 1 Hz to 5 MHz. It the water pressure sound pressure measurement standard is determined by the water sound pressure measurement standard to the work measuring instrument between the value transfer procedures, the value the best measurement capability when passing methods and values. It can be used as a basis for traceability when performing calibration.

2 Underwater sound pressure measurement reference instrument the underwater sound pressure reference is used to reproduce and preserve the water sound pressure unit quantity in the frequency range of 1 Hz to 5 MHz, and pass the water sound pressure measurement standard instrument transmits the quantity to the hydroacoustic sound pressure working measuring instrument to ensure the domestic water sound pressure and pressure the accuracy and uniformity of the values.

The unit of sound pressure is Pascal (Pa), and the sound pressure level is expressed in decibels (dB) (reference value is 1 μ Pa).

The sensitivity of the hydrophone (in V/ μ Pa) parameter is used in this verification system table to reproduce the sound pressure value.

And pass.

The hydroacoustic sound pressure measurement standard includes GJJ (acoustic) 0201 "Low frequency underwater acoustic pressure reference device", GJJ (acoustic) 0202 "Free-field reciprocity method underwater acoustic pressure reference device" and GJJ (acoustic) 0203 "high-frequency underwater acoustic pressure reference device".

2.1 Low frequency underwater sound pressure reference device the low-frequency underwater acoustic pressure reference device is a sealed measuring chamber with a piezoelectric compensation transducer, a constant measuring device, and a low the frequency reference consists of a standard hydrophone and ancillary equipment. The standard of the low frequency reference device is a standard hydrophone for reference. through the double-radiation zero-value method is used to measure the sound pressure sensitivity of a standard hydrophone with a low-frequency reference, and the sound

pressure value is reproduced. frequency the range is from 1 Hz to 2 kHz, and the uncertainty is $U = 0.5 \text{ dB}$ ($k = 2$).

The sound pressure value is transmitted by the double radiation zero value method, and the measurement standard is directly calibrated on the low frequency underwater acoustic pressure reference device.

The sound pressure sensitivity of the low frequency standard hydrophone of the appliance. The frequency range is from 1 Hz to 2 kHz, the best measurement of the magnitude transfer the capability is 0.5dB ($k=2$).

2.2 Free-field reciprocal method underwater acoustic pressure reference device
(intermediate frequency) Free-field reciprocal method underwater acoustic pressure reference device, intermediate frequency silencer pool satisfying free field conditions and its coordinate measurement the device and the intermediate frequency reference are composed of standard hydrophones and supporting equipment. The standard device of the reference device is the reference standard water listening Device. Measuring the IF level with the open field free field sensitivity of the standard hydrophone by the free field reciprocity method Recurrence. The frequency range is from 2 kHz to 200 kHz (generally referred to as the intermediate frequency hydroacoustic sound pressure reference device) when the frequency is when the frequency is 2 kHz~100 kHz, the uncertainty is $U=0.7\text{dB}$ ($k=2$); when the frequency is 100kHz~200kHz, the uncertainty is $U = 0.9 \text{ dB}$ ($k = 2$).

The transmission of sound pressure is based on the free field reciprocity method, which is composed of the intermediate frequency standard hydrophone and the intermediate frequency base in the standard instrument.

A group of standard hydrophones is used to perform a reciprocal calibration on the free-field reciprocal hydroacoustic sound pressure reference device.

Open-field free-field sensitivity of the IF standard hydrophone, and calibration with a standard hydrophone based on the IF reference participating in the calibration as a result, the calibration result of the intermediate frequency standard hydrophone is confirmed. Frequency range from 2kHz to 200kHz, when frequency for 2kHz~100kHz, the best measurement capability for magnitude transfer is 0.7dB ($k=2$); the frequency is 100kHz~200 kHz, the optimal measurement capability for magnitude transfer is 0.9 dB ($k=2$).