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**Calibration Specification for Ultrasonic Anemometers
(English Translation)**

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Introduction

JJF 1071 "Rules for Compilation of National Metrology and Calibration Standards", JJF 1001 "General Metrology Terms and Definitions", JJF 1059.1 "Assessment and Expression of Measurement Uncertainty" together constitute the basic series supporting the preparation of this specification:

This specification is published for the first time:

Calibration specifications for ultrasonic wind direction and speed measuring instruments

1 Scope

This specification applies to the calibration of ultrasonic wind direction and speed measuring instruments for measuring two-dimensional wind fields:

2 References

This specification references the following documents:

JJG431-2014 Portable three-cup wind direction anemometer QX/T 8-2002 Meteorological Instrument Terminology QX/T 84-2007 Meteorological low-speed wind tunnel performance test specification for dated references, only the dated version applies to this specification; for undated references document, its latest version (including all amendments) applies to this specification:

3 Terminology and units of measurement

3.1 Terminology

3.1.1 wind direction the direction of the wind:

[Source: QX/T 8-2002, definition 5:4:2] 3.1.2 wind speed the distance air moves per unit time:

[Source: QX/T 8-2002, definition 5:4:3]

3.1.3 Ultrasonic anemometer A wind measuring instrument made according to the principle that the propagation speed of ultrasonic waves in the air changes with the change of wind speed:

[Source: QX/T 8-2002, definition 5:4:46]

3.1.4 Wind speed and direction characteristics directional response the ultrasonic wind direction and wind speed measuring instrument is installed vertically, and can be measured from any direction under a certain fixed wind speed in the horizontal direction:

errors caused by the quantity:

3.2 Units of measurement the unit of measurement for wind speed is meter per second

(m/s); the unit of measurement for wind direction is degree (°):

4 Overview

Ultrasonic wind direction and wind speed measuring instrument is to use the sending sound wave pulse to measure the time or frequency of the receiving end (Doppler Transformation) difference to calculate the wind speed and direction of the measuring sensor or measuring instrument: Its appearance is shown in Figure 1:

Ultrasonic wind direction and wind speed measuring instruments are usually composed of sending end, receiving end, bracket, data acquisition and other parts: hair the sending end and the receiving end are equidistantly parallel at a certain distance, and the sending end sends out sound waves, which will