

JJG

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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Verification Regulation of Goriolis Mass Flow Meters (English Translation)

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Table of Contents

1 Scope...	5
2 References...	5
3 Terms and definitions...	5
4 General...	6
4.1 Working principle...	6
4.2 Composition...	7
4.3 Purpose...	7
4.4 Output signal...	7
5 Measurement performance requirements...	7
5.1 Accuracy level...	7
5.2 Repeatability...	7
6 General technical requirements...	7
6.1 Accompanying documents...	7
6.2 Marking and nameplate...	8
6.3 Appearance...	8
6.4 Protection function...	8
6.5 Sealing property...	8
7 Control of measuring instruments...	8
7.1 Verification conditions...	8
7.2 Verification items and verification methods...	10
7.3 Processing of verification results...	14
7.4 Verification cycle...	15
Appendix A Outline of type evaluation...	16
Appendix B Verification certificate/verification result notice (inner page) format...	24

1 Scope

This Regulation applies to the type evaluation, initial verification, subsequent verification and in-use inspection of Coriolis mass flow meters (hereinafter referred to as flow meters).

2 References

The provisions contained in the following standards and specifications constitute the provisions of this Regulation through reference.

JJF 1094-2002, Evaluation of the Characteristics of Measuring Instruments

JJF 1004-2004, Metrological Terms and Their Definitions for Flow Rate

GB 17820-1999, Natural Gas

GB 50251-2003, Code for design of gas transmission pipeline engineering

GB/T 13609-1999, Natural gas - Sampling guidelines

GB/T 13610-2003, Analysis of natural gas by gas chromatography

GB/T 17747.2-1999, Natural gas - Calculation of compression factor - Part 2.

Calculation using molar-composition analysis

GB 3836.1-2000, Electrical apparatus for explosive gas atmospheres - Part 1.

General requirements

GB 3836.2-2000, Electrical apparatus for explosive gas atmospheres - Part 2.

Flameproof enclosure d

GB 3836.3-2000, Electrical apparatus for explosive gas atmospheres - Part 3.

Increased safety e

During the use of this Regulation, attention shall be paid to the currently valid version of the above-referenced documents.

3 Terms and definitions

This Regulation uses the following terms and definitions, as well as the terms and definitions specified in JJF 1094-2002 and JJF 1004-2004.

6.2 Marking and nameplate

6.2.1

The flow meter shall have clear flow direction markings.

6.2.2

The flow meter shall have a nameplate. The nameplate shall generally indicate the name, model, factory number, measuring medium, flow range, nominal diameter, accuracy level, maximum working pressure, power supply voltage, flow sensor material, manufacturer and

manufacturing date, manufacturing meter license mark and number, explosion-proof level (for flammable and explosive occasions), and protection grade.

6.3 Appearance

6.3.1

Newly manufactured flow meters shall have good appearance, uniform surface color, and shall be free of burrs, scratches, cracks, rust, mildew, peeling, etc. The sealing surface shall be flat and free of damage.

6.3.2

The welding parts of the flow meter shall be smooth and clean, without any cold welding or desoldering.

6.3.3

The connectors of the flow meter must be firm and reliable and must not become loose or fall off due to vibration.

6.3.4

The numbers, words and symbols displayed on the flow meter shall be clear and neat.

6.3.5

The buttons of the flow meter shall have a moderate feel and no sticking.

6.4 Protection function

The flow meter shall have protection functions (such as passwords, etc.) for the relevant parameters that can change the metering performance of the flow meter. The meter factor or pluses per unit shall be the same as the value in the previous verification certificate.

6.5 Sealing property

Under the verification installation conditions, when the flow meter maintains the maximum verification pressure for 5 minutes, there shall be no seepage or leakage at all connections.

7 Control of measuring instruments

Measuring instrument control includes type evaluation, initial verification, subsequent verification and in-use inspection. Appendix A is the outline of type evaluation.

7.1.1.1 The flow standard device (hereinafter referred to as the device) and its

supporting instruments shall have a valid verification certificate or calibration certificate.

7.1.1.2 Mass method devices shall be selected first; volumetric method devices and

standard meter method devices can also be used, but the device shall be able to provide a mass flow rate that meets the uncertainty requirements.

7.1.1.3 When the vapor pressure of the liquid for verification is higher than the ambient atmospheric pressure, the device shall be closed.

7.1.1.4 The static pressure of the liquid at any point in the piping system and flow meter of the device shall be higher than its saturated vapor pressure. For easily vaporized liquid for verification, there shall be a certain back pressure downstream of the flow meter. The recommended minimum back pressure is the sum of 1.25 times the saturated vapor pressure of the liquid for verification at the highest verification temperature and

2 times the pressure loss of the flow meter.

7.1.1.5 The expanded uncertainty of the mass flow rate of the device shall not be greater than 1/3 of the absolute value of the maximum allowable error of the flow meter.

7.1.2 Fluid for verification

7.1.2.1

The fluid for verification shall be single-phase and clean, without visible particles, fibers, etc. The fluid shall fill the pipe and flow meter. The fluid for verification shall be close to the physical parameters such as density and viscosity of the fluid for flow meter measurement.

7.1.2.2

When the fluid for verification is natural gas, the quality of natural gas shall at least meet the requirements of Class II gas in GB 17820, and the relative density of natural gas shall be 0.55 ~ 0.80. During the verification process, the gas composition shall be relatively stable. Natural gas sampling shall be carried out in accordance with

GB/T 13609; natural gas composition analysis shall be carried out in accordance with

GB/T 13610; natural gas compression factor calculation shall be carried out in accordance with GB/T 17747.2.

7.1.2.3

When volumetric method devices are adapted, the effect of fluid temperature changes on mass flow rate shall be negligible during each verification at each flow point.

7.1.3 Verification environmental conditions

7.1.3.1

The ambient temperature is generally 5 °C ~ 45 °C; the relative humidity is generally 35% ~ 95%; the atmospheric pressure is generally 86 kPa ~ 106 kPa.