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

GB/T 2624.5-2024

**Measurement of fluid flow by means of pressure differential
devices inserted in circular cross-section conduits running full
- Part 5: Cone devices
(English Translation)**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

This document is Part 5 of GB/T 2624 "Measurement of flow rate of fluids in full pipes by means of differential pressure devices installed in circular cross-section pipes".

GB/T 2624 has published the following parts.

Part 1: General principles and requirements;-Part 2: Orifice Plates;-Part 3: Nozzles and Venturi nozzles; -Part 4: Venturi tube;-Part 5: Conical devices;-Part 6: Wedge devices. -this document is equivalent to ISO 5167-5:2022 "Measurement of full pipe flow rate by differential pressure devices installed in circular cross-section pipes" Part 5: Internal cone flowmeter.

The following minimal editorial changes were made to this document.

To coordinate with the existing standards, the name of the standard was changed to "Measurement of the flow rate of a full pipe by using a differential pressure device installed in a circular cross-section pipe" Part 5: Conical device";

For ease of use, relevant notes are added to the text (see 4.2.9, 5.4.4, 5.4.5, 5.6). -Change 5.5.2 cited in 7.1 to 5.7 (the original text is wrong). -

Introduction

GB/T 2624 consists of six parts, covering orifice plates, nozzles, venturi tubes, cones and wedges installed in full pipes.

When measuring fluid flow, its geometric dimensions and usage (installation and working conditions) are also given. It also provides the method for calculating flow and its corresponding Necessary information for determination.

GB/T 2624 (all parts) is only applicable to the difference between the flow rate of the fluid in the whole measuring section, which is subsonic and can be regarded as single-phase flow.

Pressure devices are not suitable for measuring pulsating flow. In addition, each device can only be used within the specified pipe size and Reynolds number range.

Alternatively, it may be used within its calibrated range.

GB/T 2624 (all parts) applies to devices that have undergone direct calibration experiments, the number, distribution and quality of which are sufficient to enable the relevant the application system can be based on experimental results, and the coefficients given are also within a certain predictable uncertainty range.

The device installed in the pipeline is called "primary device". "Primary device" also includes the pressure tapping port. All the necessary the other meters or devices are called "secondary devices." The flow computer that receives these readings and executes the algorithm is called the "tertiary device." GB/T 2624 (all parts) deals mainly with primary devices, with only occasional mention of secondary devices (see ISO 2186) and tertiary devices.

GB/T 2624 "Measurement of full pipe flow rate using a differential pressure device installed in a circular cross-section pipe" consists of six parts.

Part 1: General principles and requirements. It aims to give general terms and definitions, symbols, principles and calculation methods, measurement, installation General requirements for methods of determining flow measurement uncertainty, and the pipe sizes and Reynolds numbers for which these differential pressure devices are applicable.

scope.

Part 2: Orifice plates. This part is intended to give the geometric dimensions and usage of orifice plates. Orifice plates can be used with flange pressure ports, corner pressure ports, Use with D, D and D/2 pressure ports.

Part 3: Nozzles and Venturi nozzles. This part is intended to give the geometric dimensions and usage of nozzles and Venturi nozzles.

ISA 1932 nozzles, long diameter nozzles and venturi nozzles.

Part 4: Venturi tube. Aims to give the geometric dimensions and usage of the Venturi tube. It covers cast, machined and There are three types of classic venturi tubes. rough welded iron plate type.

Part 5: Cone device. This part is intended to give the geometric dimensions and usage of the cone device, and is used in conjunction with GB/T 2624.1.

The device has one or more upstream pipe wall pressure tapping ports and a downstream pressure tapping port located at the tail of the cone.

The tube is connected from the inside of the cone to the cone support structure, and then passes upward through the support structure to be connected to the differential pressure transmitter.

Part 6: Wedge device. This part aims to give the geometric dimensions and usage of the wedge device, and is used in conjunction with GB/T 2624.1.

The primary device of the throttling device consists of a wedge-shaped throttling piece with specific geometric dimensions.

GB/T 2624 (all parts) does not address safety issues. It is the user's responsibility to ensure that the system complies with applicable safety regulations.

Differential pressure installed in circular cross-section pipes Device to measure full pipe fluid flow Part 5: Cone device

1 Scope

This document specifies the geometry and use of cone devices installed in pipelines to measure the flow rate of fluids in full pipes (installation and operation).

condition).

For certain applications, the uncertainty of an uncalibrated cone may be so great that it may be necessary to calibrate the cone in accordance with Chapter 7.

Real flow calibration is carried out according to the regulations.

This document also provides relevant information for calculating flow rates and can be used in conjunction with the requirements of ISO 5167-1:2022.

This document applies only to cone devices where the flow is subsonic throughout the measuring section and can be considered to be single-phase flow. Not calibrated the conical device can only be used within the specified range of pipe size, pipe surface roughness, beta [given by formula (2)] and Reynolds number (Re).

use.

This document does not apply to the measurement of pulsating flows. This document does not cover uncalibrated conical devices with an inner diameter less than 50 mm or greater than 500 mm, or for pipelines with a pipeline Reynolds number (ReD) less than 8×10^4 or greater than 1.2×10^7 .

A conical device is a primary device consisting of a conical throttling body fixed concentrically in the center of the pipe with the head facing upstream. This document defines the conical device has one or more upstream pipe wall pressure tapping ports and a downstream pressure tapping port located at the tail of the cone. The pressure pipe of the downstream pressure tapping port is connected to the the inside of the cone is connected to the cone support structure, and then passes upward through the support structure to be connected to the differential pressure transmitter.

For other conical structures, there was insufficient experimental data to characterize them at the time of preparation of this document.

Perform real-flow calibration as specified in Chapter 7.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.