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

GB/T 45856-2025

**Vacuum technology - Vacuum gauges - Specifications,
calibration and measurement uncertainties for Pirani gauges**

真空技术 真空计 皮拉尼真空计的规范、校准和测量不确定度

(English Translation)

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Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
3.1 Component Definition	
3.2 Physical parameter definition	
4 Symbols and abbreviations	
5 Pirani vacuum gauge principle	
6 Pirani vacuum gauge specifications	
6.1 General Principles	
6.2 Measurement Principle	
6.3 Output Type	
6.4 Output Range and Output Display Resolution	
6.5 Measuring range and full scale	
6.6 Expected measurement uncertainty	
6.7 Materials exposed to gases	
6.8 Connecting flange	
6.9 Interface and Pin Connection	
6.10 Warm-up time	
6.11 Compatibility of vacuum gauge tube and control unit	
6.12 Normal operating (environmental) conditions	
6.13 Power Supply	
6.14 Cable length	
6.15 Maximum baking temperature	
6.16 Dimensions of the regulator and control unit	
6.17 Installation Direction	
7 Additional (optional) specifications for Pirani vacuum gauges	
7.1 Long-term instability	
7.2 Relative sensitivity coefficient	
7.3 Hysteresis	
7.4 Response Time	

- 7.5 Inspection records and calibration certificates
- 7.6 Configuration
- 7.7 Quality
- 7.8 Storage and transportation conditions
- 7.9 Photos
- 7.10 Maximum power consumption
- 7.11 Pressure set point
- 8 Calibration and other measurement steps
 - 8.1 General
 - 8.2 Calibration conditions
 - 8.3 Installation and adjustment of calibration objects
 - 8.4 Calibration
 - 8.5 Measurement uncertainty during calibration
 - 8.6 Calibration Certificate
 - 8.7 Hysteresis Measurement Procedure
 - 8.8 Response time measurement procedure
- 9 Measurement uncertainty in use
- Appendix A (Informative) Typical Pirani Vacuum Gauges
- Reference

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.

This document is equivalent to ISO 19685:2017 "Vacuum technology - Vacuum gauges - Specifications, calibration and measurement uncertainty of Pirani gauges". Spend".

Introduction

For specific vacuum gauges for which no specific guidelines exist, ISO 3567 and ISO 27893 are used as basic standards and are also commonly used.

Detailed criteria for specific vacuum gauges will be given in subsequent technical documents.

This document is an extension of ISO 3567 and ISO 27893 when characterizing or calibrating Pirani vacuum gauges, or when using them as standard vacuum gauges.

Replenish.

Pirani vacuum gauges are widely used to measure medium vacuum pressure to atmospheric pressure. This document describes the Pirani vacuum gauges used to measure medium and low vacuum pressure.

Relevant parameters, calibration criteria and uncertainties for force and transmitted pressure range.

1 Scope

This document establishes the parameters of Pirani vacuum gauges, describes their calibration procedure, and specifies the measurement inconsistencies to be considered when using these gauges. Certainty.

This document applies to Pirani vacuum gauges with an operating pressure range of 0.01Pa~150kPa.

This document supplements ISO 3567 and ISO 27893 when calibrating Pirani vacuum gauges and using them as reference standards.

Additionally, this document describes a method for characterizing the response time and hysteresis of Pirani vacuum gauges.

2 Normative references

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

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

Note: GB/T 34873-2017 Vacuum gauge calibration by direct comparison with a standard vacuum gauge (ISO 3567:2011, IDT)

ISO 27893 Vacuum technology - Evaluation of the uncertainty of calibration results by direct comparison of vacuum gauges with standard vacuum gauges

Note: GB/T 34876-2017 Vacuum technology Vacuum gauge and standard vacuum gauge direct comparison calibration results uncertainty assessment (ISO 27893:2011, IDT)

Note: GB/T 27025-2019 General requirements for the competence of testing and calibration laboratories (ISO /IEC 17025:2017, IDT)

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1.1

A vacuum gauge that determines pressure by measuring the heat transfer between two fixed surfaces maintained at different temperatures.

NOTE: This type of vacuum gauge depends on the pressure-dependent heat conduction of the gas.
[Source: ISO 3529-3:2014, 2.4.2.2, modified - examples deleted]

3.1.2 Pirani vacuum gauge

The heating element is part of a Wheatstone bridge circuit, which provides energy to the element and measures the resistance or power dissipated by the element.