

ICS 23.100.01

CCS J 20



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

**GB/T 28782.2-2023**

Replacing GB/T 28782.2-2012

---

**Hydraulic fluid power - Measurement techniques - Part 2:  
Measurement of average steady-state pressure in a closed  
conduit**

**Issued on: August 6, 2023**

**Implemented on: August 6, 2023**

---

**Issued by: State Administration for Market Regulation, China National  
Standardization Administration**

## Table of Contents

|                                  |   |
|----------------------------------|---|
| Introduction                     |   |
| 1 Scope                          | 1 |
| 2 Normative reference documents  | 1 |
| 3 Terms and Definitions          | 1 |
| 4 Measuring instrument selection | 1 |
| 5 Pressure measuring point       | 2 |
| 6 General Procedure              | 4 |

## Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 2 of GB/T 28782 "Hydraulic Transmission Measurement Technology". GB/T 28782 has released the following parts.

---Part 1. General principles;

---Part 2. Measurement of average steady-state pressure in closed circuits.

This document replaces GB/T 28782.2-2012 "Hydraulic transmission measurement technology Part 2. Measurement of average steady-state pressure in closed circuits"

"Quantity", compared with GB/T 28782.2-2012, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) Changed "Terms and Definitions" (see Chapter 3, Chapter 3 of the.2012 edition);
- b) Delete "Evaluation of the uncertainty of readings of measuring instruments" (see Chapter 4 of the.2012 edition);
- c) Added "Measuring Instrument Selection" (see Chapter 4);
- d) The calibration of working instruments has been deleted (see Chapter 5 of the.2012 edition);
- e) Changed the requirements for "pressure measuring points" (see Chapter 5, 7.2 of the.2012 edition);
- f) Added "general procedures" (see Chapter 6);

- g) "Determination of calibration uncertainty" is deleted (see Chapter 6 of the.2012 edition);
- h) Added "synthetic standard uncertainty" (see Chapter 7);
- i) "Equipment selection, test equipment and pulse dampers" are deleted (see 7.1, 7.3 and 7.4 of the.2012 version);
- j) Delete "Acquisition of test data and calculation of the influence of uncertainty of pressure measurement points" (see Chapter 8 of the.2012 edition);
- k) "Total measurement uncertainty" has been deleted (see Chapter 9 of the.2012 edition).

This document is modified to adopt ISO 9110-2.2020 "Hydraulic transmission measurement technology Part 2.Determination of average steady-state pressure in closed circuits"

Measurement".

The technical differences between this document and ISO 9110-2.2020 and their reasons are as follows.

---Replaced ISO 5598 (see Chapter 3) with normatively cited GB/T 17446 to adapt to my country's technical conditions and improve reliability

operability;

---Replaced ISO 9110-1 (see Chapter 4 and Chapter 7) with the normatively quoted GB/T 28782.1 to adapt to my country's technology

conditions to improve operability.

The following editorial changes have been made to this document.

---Integrate formula (2) ~ formula (4) into one formula, and the subsequent formula numbers will be postponed;

---Changed the symbols of fluid speed and fluid density;

---Reference removed.

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

## Introduction

As a key technology in the development and production of hydraulic components and hydraulic systems, hydraulic transmission measurement technology is an important tool for verifying product performance indicators and reliability.

important means of sex, lifespan, etc. The performance characteristics of hydraulic components and hydraulic systems can be quantified to provide a basis for action or decision-making.

GB/T 28782 "Hydraulic Transmission Measurement Technology" aims to unify the measurement technology in hydraulic transmission. It is planned to be developed by two departments.

Composition.

---Part 1. General principles. The purpose is to identify general guidelines for measuring hydraulic component performance parameters under static or steady-state operating conditions.

---Part 2. Measurement of average steady-state pressure in closed circuits. The purpose is to determine the average steady-state pressure in the hydraulic transmission circuit program of.

Hydraulic transmission measurement technology part 2. containment

Measurement of the average steady-state pressure in the circuit

## 1 Scope

This document establishes procedures for measuring average steady-state pressure in hydraulic transmission circuits.

This document is suitable for measuring seals with an inner diameter greater than 3mm, an average flow velocity less than 25m/s, and an average steady-state static pressure less than 70MPa.

The average steady-state pressure in the circuit.

This document does not apply to pressure sensors that are built-in or integrated into the wall of a closed fluid pipe.

This document gives an estimation formula for the combined standard uncertainty of pressure measurements.

## 2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

GB/T 17446 Fluid transmission system and component vocabulary (GB/T 17446-2012, ISO 5598.2008, IDT)

GB/T 28782.1 Hydraulic transmission measurement technology Part 1.General principles  
(GB/T 28782.1-2023, ISO 9110-1.

2020,MOD)

### 3 Terms and definitions

The terms and definitions defined in GB/T 17446 and the following apply to this document.

#### 3.1

The pressure loss between two pressure measuring points caused only by the test pipeline (excluding the component under test).

### 4 Measuring instrument selection

4.1 4.2~4.6 should be evaluated according to GB/T 28782.1.

4.2 Uncalibrated measuring instruments should be fully calibrated using traceable reference standards. and record information about reference standards. According to regulations

Calibrate gauge or absolute pressure instruments using established procedures.

Calibrate the differential pressure instrument at the line pressure relevant to its application by pressurizing both ports of the instrument simultaneously. To measure bidirectional pressure, use the instrument

Both the positive and negative measuring quadrants of the instrument should be calibrated.

If the above calibration method is not feasible or the pipeline pressure endured by the differential pressure instrument changes during measurement, calculate the composite standard in Chapter 7.

When determining the accurate uncertainty, the maximum measurement error caused by the pipeline pressure effect should be regarded as the standard uncertainty component.

Conduct periodic inspections of instruments according to corresponding accuracy level requirements.

4.3 Evaluate the measurement uncertainty introduced by the reading capability of the reading device connected to or equipped with the measuring instrument.

4.4 Evaluate the measurement uncertainty components introduced by calibration. Each measuring instrument should establish an uncertainty model derived from the calibration results.

4.5 Each measuring instrument should have a calibration record or calibration database and be attached with a calibration label, see GB/T 28782.1.