

ICS 23.100.60

CCS J 20



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

GB/T 18854-2015

Replacing GB/T 18854-2002

**Hydraulic fluid power -- Calibration of automatic particle
counters for liquids**

液压传动 液体自动颗粒计数器的校准

(English Translation)

Issued on: December 31, 2015

Implemented on: July 1, 2016

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

Preface

Introduction

1 Scope

2 Normative reference document

3 Terms and definitions

4 Materials and equipment

5 Automatic particle counter calibration process

6 Size calibration procedure

7 Data representation

8 Note

Appendix A (Normative Appendix) APC Initial Inspection Procedure

Appendix B (normative appendix) coincidence error determination procedure

Appendix C (Normative Appendix) Flow Limit Determination Procedure

Appendix D (normative appendix) Resolution determination procedure

Appendix E (Normative Appendix) Particle Count Accuracy Calibration Procedures

Appendix F (Normative Appendix) Bottled Secondary Calibration Suspension Sample Preparation and Verification Procedures

Appendix G (informative) Calculation Example

Appendix H (informative) Calibration fluid sample particle size distribution verification procedure

Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 18854-2002 "Calibration of Automatic Particle Counter for Hydraulic Drive Liquid". With GB/T 18854-2002, the main technical changes are as follows.

- Added definition of automatic particle counter (see 3.1).
- Modify the working flow rate for the workflow (see 3.6, 2002 3.5).
- modify the calibration once for calibration (see 3.9, 2002, 3.8).
- modified secondary calibration for secondary calibration (see 3.10, 2002 edition 3.9).
- The calibration process has been modified and no longer be required to be calibrated in the order in which it is specified (see 5.1, 2002, 5.1).

- Added comments on how to find changes in automatic particle counter calibration (see 5.1).

Increased particle count requirements. In order to facilitate the effective data in the particle channel setting, it is required to count at least 5000 stars the number of grains (see 6.3).

--- modified the coincidence error data processing method. The coincidence error measurement no longer requires preparation and analysis of 0% of the sample, but modified to the regression equation requiring the coincidence error is measured directly through the origin of the coordinates (see B.4 and B.7, 2002 B.4, B.7).

--- modified the flow limit determination requirements. The instrument is divided into fixed flow and adjustable flow bottle sampler. For fixed flow the instrument only requires testing that can continue to provide constant flow within 3% of the test. For adjustable flow of the instrument, this the standard not only requires testing to be able to continuously provide constant flow within 3% of the test, but also requires the determination of its work flow and Flow limits (see Appendix C, Appendix C, 2002).

- an acceptable resolution limit is modified to increase the acceptable resolution limit for the automatic particle counter from 10% to 15% (see D.12, 2002, D.12).

--- modified the requirements of the test powder. Requires the use of NISTRM8632 powder calibration count accuracy, no longer allowed to use ISO UFTD (see E.3, 2002, ed. E.3).

- an example of how to establish a calibration curve (see Appendix G).

- Added an appendix to provide guidance on the calibration of the calibration fluid sample particle size distribution (see Appendix H).

This standard uses the re-drafting method to modify ISO 11171.:2010 "Calibration of Hydraulic Drive Liquid Automatic Particle Counter" (English Version).

The technical differences between this and ISO 11171.:2010 and the reasons are as follows.

--- on the normative reference documents, this standard has made a technical differences in the adjustment to meet China's technical conditions, adjust the situation the situation is reflected in Chapter 2, "Normative references", as follows.

Replace GB 5598 with GB/T 17446 (see Chapter 3);

- Replace ISO 3722 with GB/T 17484 (see 4.9);

Replace GB 16889 with GB/T 18853 (see 4.2, F.2);

Replace GB 12103-1 with GB/T 28957.1 (see 4.6);

Replace GB 21501-3 with GB/T 29024.3 (see 6.8);

- Increased JJG196-2006 common glass gauge verification procedures (see 4.9).

This standard has made the following editorial changes.

- modify the footnote of table 1 a for the table narrative, and increase the "note".
- modified the expression formula with percentage formula to regulate the expression.
- modify the flow chart to start and end the expression to regulate the expression.
- "Appendix G" and "bibliography" in ISO 11171:2010 were deleted because the use of the two terms for this standard does not Large, and increased the length of the standard.

This standard is proposed by the China Machinery Industry Federation.

This standard by the National Hydraulic and Pneumatic Standardization Technical Committee (SAC/TC3) centralized.

This standard is responsible for the drafting unit. National Defense Science and Technology Industrial Granularity Level 1 metering station.

This standard participated in the drafting unit. Chengdu Ethernet Aviation Engineering Technology Co., Ltd., Jiujiang seven precision Electrical and Mechanical Technology Co., Ltd.

Division, Beijing University of Chemical Technology.

Introduction

In a hydraulic system, the power is transmitted and controlled by means of a pressurized liquid in a closed circuit. The liquid is both a lubricant and a work Rate transfer medium. Reliable system performance requires the control of contaminants in the liquid. In order to quantitatively and qualitatively determine the liquid Particulate contaminants that require accurate sampling and accurate determination of the size distribution and concentration of contaminants. Liquid automatic particle counter is a suitable one and widely used equipment can be used to determine the size distribution and concentration of contaminated particles. The accuracy of the instrument is ensured by calibration.

This standard specifies a recommended standard calibration procedure for determining particle size and counting accuracy. Level 1 particle size calibration Calibration with the NISTSRM2806 suspension, the particle size distribution of this suspension has been passed through the NIST (National Standard Technology Research Institute) set value. The secondary calibration method, which is traceable to NIST, is calibrated using ISO MTD suspensions, but the suspension is A liquid automatic particle counter calibrated by a calibration method was used for analysis. Concentration limits are achieved by using a series of concentrated suspensions the dilution of the solution was measured.

Application of this standard can also determine the instrument's work and performance limits.

Calibration of Automatic Particle Counter for Hydraulic Transmission

1 Scope

This standard specifies the calibration methods and procedures for liquid automatic particle counters, including.

- a) Perform a primary particle size calibration of the liquid automatic particle counter for the analysis of the bottled liquid sample and measure the counting performance and the sensor Resolution;
- b) using a calibrated liquid automatic particle counter certified suspension for secondary particle size calibration;
- c) determine the scope of qualified work and performance limits;
- d) Verify the performance of the particle sensor using RM8632;
- e) Determine coincidence error limits and flow limits.

2 Normative reference documents

The following documents are indispensable for the application of this standard. For dated references, only the dated edition applies to this article Pieces. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 17446 fluid transmission system and component vocabulary (GB/T 17446-2012, ISO 5598.:2008, IDT) GB/T 17484 Identification and control of purification methods for hydraulic oil sampling vessels (GB/T 17484-1998, idtISO 3722. 1976) GB/T 18853 hydraulic transmission filter to assess the filter performance of multiple passes (GB/T 18853-2015, ISO 16889.:2008, MOD) GB/T 28957.1 Road vehicles - Test dust for filter evaluation - Part 1. Silica test dust (GB/T 28957.1-2012, ISO 12103-1.:1997, MOD) GB/T 29024.3 Particle size analysis - Optical measurement of single particles - Part 3. Liquid particle counter photoresist method (GB/T 29024.3-2012, ISO 21501-3.:2007, IDT) JJG196-2006 commonly used glass gauge

3 Terms and definitions

GB/T 17446 Definitions and the following terms and definitions apply to this document.

Automatic particle counter; APC it is possible to automatically count and measure the size of a single particle suspended in a certain size range in the fluid.

Note: Automatic particle counter at least by the particle sensor, according to the controllable flow rate of a specific volume of liquid to the sensor device, the signal processor, the sensor output the size of the individual particles is converted into a particle size distribution analyzer and a device for outputting the liquid sample size distribution results. Typical particle size Inch measurement