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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 16857.901-2020

Geometrical product specifications (GPS) - Acceptance and reverification tests for coordinate measuring machines (CMM) - Part 901: CMMs with multiple imaging probing system

产品几何技术规范（GPS） 坐标测量机的验收检测和复检检测 第901部分：配置多影像探测系统的坐标测量机

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Foreword

GB/T 16857 ``Acceptance Testing and Reinspection Testing of GPS Coordinate Measuring Machines'' is planned to be divided into the following parts.

2.Coordinate measuring machines used to measure linear dimensions;

3.Configure the axis of the turntable as the fourth axis of the coordinate measuring machine;

4.Coordinate measuring machine used in scan mode;

5.Coordinate measuring machine using single probe or multi-probe contact detection system;

6.Calculate the evaluation of the error of Gaussian fitting elements;

7.Coordinate measuring machine using visual detection system;

8.Coordinate measuring machine using optical distance sensor;

9.Coordinate measuring machine equipped with multiple detection systems;

---Part 901: Coordinate measuring machine with multi-image detection system;

10.Laser tracker used to measure the distance from point to point;

12.Articulated arm coordinate measuring machine (CMM). This part is part 901 of GB/T 16857. This section was drafted in accordance with the rules given in GB/T 1.1-2009. Please note that certain contents of this document may involve patents. The issuing agency of this document is not responsible for identifying these patents. This part is proposed and managed by the National Standardization Technical Committee for Product Geometric Technical Specifications (SAC/TC240). Drafting organizations of this section. Suzhou

Tianzhun Technology Co., Ltd., China Machinery Productivity Promotion Center, China Institute of Metrology, Shaanxi Wei Er Electromechanical Technology Co., Ltd., Shenzhen Institute of Metrology and Quality Inspection. The main drafters of this section. Wang Zhiwei, Ming Cuixin, Wang Weinong, Cao Kuikang, Yang Cong, Yu Jiping, Shi Yushu, Guo Jiping, Zhang Tao, Zhu Yue.

This part is based on ISO 10360-9Geometrical productspecifications(GPS)-Acceptanceandreverifica-tiontestsforcoordinatemeasuringsystems(CMS)-Part 9: CMMswithmultipleprobingsystems Drafting is the specific condition of the coordinate measuring machine (in accordance with the definition in Part 7) of the visual detection system with multiple different parameters and directions. Specific applications under. Product Geometric Technical Specification (GPS) Acceptance test and reinspection test of coordinate measuring machine Part 901: Configuration of multi-image detection system Coordinate measuring machine

1 Scope

GB/T 16857.901-2020 is the Chinese national standard on geometrical product specifications (gps) - acceptance and reverification tests for coordinate measuring machines (cmm) - part 901: cmms with multiple imaging probing system, in the field of metrology and measurement. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 31 March 2020 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 October 2020. Classification: ICS 17.040.30, CCS J04. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

7 Product Geometric Technical Specification (GPS) Acceptance test and reinspection test of coordinate measuring machine Part

7.Use visual Coordinate measuring machine of perception detection system [Geometrical productspecifications(GPS)-Acceptanceandreverification testsforcoordinatemeasuringmachines(CMM)-Part 7: CMMsequippedwithimagingprobingsys- tems] ISO 10360-

9 Product Geometric Technical Specification (GPS) Acceptance test and reinspection test of coordinate measuring machine Part

9.Multiple configurations A coordinate measuring machine for a detection system [Geometrical productspecifications(GPS)-Acceptanceandreverification testsforcoordinatemeasuringsystems(CMS)-Part 9: CMMswithmultipleprobingsystems] ISO

14253-

1 Geometric Technical Specifications for Products (GPS) Measurement and Inspection of Workpieces and Measuring Equipment Part

1.Inspection and Inspection of the Standard [Geometricalporductspecifications(GPS)-Inspectionbymeasurementof workpiecesandmeasuringequipment-Part

1.Decisionrulesforverifyingconformityornonconformitywith specifications] ISO /IEC Guide

99 International Metrology Vocabulary Fundamentals and Common Concepts and Related Terminology (VIM) [Internationalvocabu-laryofmetrology-Basicandgeneralconceptsandassociatedterms(VIM)]

2 Normative references

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

GB/T 18779.1 Product Geometrical Quantity Technical Specification (GPS) Measurement Inspection of Workpieces and Measuring Equipment Part

1.Inspection According to Specifications Rules for determining qualified or unqualified inspection (GB/T 18779.1-2002, eqv ISO 14253-1.1998) ISO 10360-

1 Product Geometric Technical Specification (GPS) Acceptance test and re-inspection test of coordinate measuring machine Part

1.Vocabulary [Geometricalporductspecifications(GPS)-Acceptanceandreverificationtestsforcoordinateme asur- ingmachines(CMM)-Part

3 Terms and definitions

The terms defined by ISO 10360-1, ISO 10360-7, ISO 10360-9, ISO 14253-1 and ISO /IEC Guide99 and the following And definitions apply to this document.

3.1 Imagingprobingsystemimagingprobingsystem Establish a detection system for measuring points through the imaging system. Note

1.This section is mainly about image detection systems that can measure in the lateral direction of the detection system axis. Note

2.Video or visual detection system is the image detection system.

3.2 CMMswithmultipleimagingprobingsystem Coordinate measuring machine equipped with

multiple image detection systems. 3.3 (Of the imaging probe system) measuring plane (of the imaging probing system) The two-dimensional plane defined by the field of view of the image detection system.

3.4 Parallel multiple imaging detection system paralelmultipleimagingprobingsystem Multi-image detection system with parallel measurement planes.

3.5 Nonparalelmultipleimagingprobingsystem Multi-image detection system with non-parallel measurement planes.

3.6 Testcircle A round physical standard device for acceptance testing and re-inspection testing.

3.7 Testsphere A spherical physical standard device for acceptance inspection and re-inspection inspection.

3.8 Parallel multiple imaging detection system shape error paralel multiple imaging probing system form error PForm.Cir.nx25PMIPS Use the parallel multi-image detection system to measure the same detection circle, and use the unconstrained least squares method to fit the data of all image detection systems Calculate the center of the circle, the range of the distance from all measuring points to the center of the circle is the shape error.

3.9 Parallel multiple imaging detection system size error paralel multiple imaging probing system size error PSize.Cir.nx25PMIPS Use the parallel multi-image detection system to measure the same detection circle, and use the unconstrained least squares method to fit the data of all image detection systems Calculate the diameter, the difference between the calculated value and the actual value of the detection circle is the size error.

3.10 Parallel multiple imaging detection system position error paralel multiple imaging probing system location error LDia.Cir.nx25PMIPS Use the parallel multi-image detection system to measure the same detection circle, and use the unconstrained least square method to fit the data of each detection system The center of the circle, the diameter of the smallest circumscribed circle including the center of each circle, is the position error.

3.11 Nonparalelmultipleimagingprobingsystemformerror PForm.Sph.nx25NPMIPS Use the non-parallel multi-image detection system to measure the same detection ball, and use the unconstrained least squares method to simulate the data of all image detection systems. Calculate the center of the sphere together, and the range of the distance from all measuring points to the center of the sphere is the shape error.

3.12 Nonparalelmultipleimagingprobingsystemsizeerror PSize.Sph.nx25NPMIPS Use the non-parallel multi-image detection system to measure the same detection ball, and use the unconstrained least squares method to simulate the data of all image detection systems. The diameter is calculated together, and the difference between the calculated value and the actual value of the detection ball is the size error.