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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 14660.1-2023

Replacing GB/T 14660-1993

NC jig vertical boring machine - Part 1:Testing of the accuracy

数控立式坐标镗床 第1部分：精度检验

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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 1 of GB/T 14660 "CNC Vertical Coordinate Boring Machine". GB/T 14660 has released the following parts.

1.Accuracy test. This document replaces GB/T 14660-1993 "Accuracy of CNC Coordinate Boring Machines". Compared with GB/T 14660-1993, except for structural adjustments In addition to editorial changes, the main technical changes are as follows:

a) Changed the expression of G1 tolerance (see Table 1 in Chapter 5, G1 in Chapter 4 of the.1993 edition);

b) Changed G2, G3 and G4 to axis movement angle deviation (see Table 2, Table 3 and Table 4 in Chapter 5, G2 and G4 in Chapter 4 of the.1993 edition). G3, G4);

c) G5 is added to be consistent with the machine tool structure and in line with the actual use of the industry (see Table 5 in Chapter 5);

d) The requirements for G6, G7, and G8 have been changed, and the stroke binning has been deleted, consistent with the current standards (see Table 6, Table 7, Chapter 5, Table 8, G7, G8, G9 in Chapter 4 of the.1993 edition);

e) G9 is added to be consistent with the machine tool structure and actual industry usage (see Table 9 in Chapter 5);

f) Change G10 to G14, consistent with the current standard (see Table 14 in Chapter 5,.1993 version of G10);

g) Changed the division of G12 and G13 spindle ends (see Table 12 and Table 13 in Chapter 5, G11 and G12 in the.1993 edition);

h) The inspection items and tolerance values for machine tool positioning accuracy and repeatable positioning accuracy inspection have been changed (see Table 15, Table 16, Chapter 6, Table 17, Table 18, G13, G14, G15 of the.1993 edition);

i) The division of work surface width has been changed (see Table 19, Table 21 in Chapter 7, P1, P3, P4, P5 and P6 in the.1993 edition). Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents. This document is proposed by China Machinery Industry Federation. This document is under the jurisdiction of the National Metal Cutting Machine Tool Standardization Technical Committee (SAC/TC22). This document was drafted by: General Technology Group Kunming Machine Tool Co., Ltd., General Technology Group Machine Tool Engineering Research Institute Co., Ltd. Yang Branch, General Technology Group Shenyang Machine Tool Co., Ltd., and Wuhan Heavy Machine Tool Group Co., Ltd. The main drafters of this document. He Chunshu, Cui Gangwei, Zi Limin, Luo Yonghua, Hua Chunlei, Li Chengyong, Nie Yan, Tan Zhi, Zhou Xingxing, Wang Shibin, Xu Haoli, Guo Xin. This document was first published in.1993 and this is the first revision.

The purpose of formulating this document is to further standardize the accuracy inspection method of CNC vertical coordinate boring machines and make it consistent with the actual structure of machine tools. structure, consistent with current relevant national standards. As a high-precision machine tool, this type of machine tool has precision boring, precision milling, precision engraving, drilling, It has functions such as reaming and can also be used as a coordinate measuring machine with corresponding detection components. GB/T 14660 is designed to achieve the main functions of machine tools. It can stipulate the requirements for geometric accuracy, positioning accuracy and repeated positioning accuracy, working

accuracy, inspection methods and corresponding tolerances. It is planned to consist of two Partial composition.

1.Accuracy test. The purpose is to establish the inspection items and inspections that need to be followed during factory inspection of this type of machine tool products. index.

1 Scope

GB/T 14660.1-2023 is the Chinese national standard on nc jig vertical boring machine - part 1:testing of the accuracy, in the field of manufacturing engineering. 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 6 August 2023 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2024. Classification: ICS 25.080.20, CCS J54. 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.

This document specifies the inspection requirements and inspection requirements for the geometric accuracy, positioning accuracy, repeat positioning accuracy, and working accuracy of CNC vertical coordinate boring machines. methods and corresponding tolerance requirements. This document is applicable to ordinary-grade (code-named P) and precision-grade (code-named M) single-column CNC with a work surface width not greater than.2000mm. Accuracy inspection of vertical coordinate boring machines and double-column CNC vertical coordinate boring machines.

2 Normative reference documents

The contents of the following documents constitute indispensable 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 17421.1-2023 General principles for inspection of machine tools Part

3 Terms and definitions

There are no terms or definitions to be defined in this document.

4 General requirements

4.1 Unit of measurement All linear dimensions, deviations and corresponding tolerances in this document are in millimeters (mm); angular dimensions are in degrees (°). angle Deviations and corresponding tolerances are generally expressed as ratios, but in some cases, for clarity, they can be expressed in microradians (μrad) or arc seconds ("). It should be expressed according to the following equivalent relationship.
0.010/1000=10x10-6=10μrad~2"

4.2 Implementation standards When using this document, the provisions of GB/T 17421.1-2023 should be followed, especially the installation, spindle and other moving parts before machine tool inspection. Temperature rise of parts, inspection methods and recommended accuracy of inspection tools. The positioning accuracy and repeat positioning accuracy of machine tools are in accordance with GB/T 17421.2-2023 Provisions. The installation level and ambient temperature of the machine tool meet the following requirements.

---Adjust the installation level of the machine tool according to the provisions of

6.1 in GB/T 17421.1-2023, place the worktable in the middle of the stroke, and Place a level in the middle of the workbench. The readings of the level in both the longitudinal and transverse directions should not exceed 0.02/1000;

---During inspection, the ambient temperature should be maintained within 20°C±1°C, and the machine tools and inspection tools should not be placed in the measurement environment for less than 12h to ensure a stable state before inspection.

4.3 Inspection sequence The order of inspection items listed in this document does not represent the actual order of inspection. For the convenience of assembling and disassembling inspection tools and inspection, you can press any