

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 7517 : 2018

(JMA/JSA)

**Vernier, dial and digital height
gauges**

ICS 17.040.30

Reference number : **JIS B 7517 : 2018 (E)**

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Date of Establishment: 1960-03-01

Date of Revision: 2018-01-22

Date of Public Notice in Official Gazette: 2018-01-22

Investigated by: Japanese Industrial Standards Committee
Standards Board for ISO area
Technical Committee on Basic Engineering

JIS B 7517:2018, First English edition published in 2018-04

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents,
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Printed in Japan

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Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Design specification (design characteristics)	3
4.1 General	3
4.2 Names of main parts	3
4.3 Dimensions	5
4.4 Types of indicating devices	6
4.5 Measuring and scribing stylus	11
4.6 Instrument base	11
4.7 Construction and function	11
4.8 Hardness	12
5 Metrological characteristics and performance	12
5.1 General	12
5.2 Operating conditions	12
5.3 Effect of slider locking	12
5.4 Maximum permissible error (MPE)	12
5.5 Performance	17
6 Marking in product documentation	19
7 Proving conformance with specifications	19
7.1 General	19
7.2 Measurement standards for the calibration of metrological characteristics and performance	19
7.3 Standard reference temperature	19
8 Inspections	19
9 Marking	19
Annex A (informative) Notes on use	20
Annex B (informative) Typical data sheet for design specification (design characteristics), metrological characteristics and performance	21
Annex JA (informative) Marking in product documentation	22
Annex JB (informative) Comparison table between JIS and corresponding International Standard	23

Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Precision Measuring Instruments Manufacturers Association (JMA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS B 7517**: 1993 is replaced with this Standard.

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Vernier, dial and digital height gauges

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 13225:2012**, Edition 1, with some modifications of the technical contents to correspond to the actual situations of manufacturing industries and application.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JB.

1 Scope

This Standard specifies height gauges with analogue indication: vernier scale or circular scale (dial), and those with digital indication.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 13225:2012 *Geometrical product specifications (GPS)—Dimensional measuring equipment; Height gauges—Design and metrological characteristics* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified) and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0641-1 *Geometrical Product Specifications (GPS)—Inspection by measurement of workpieces and measuring equipment—Part 1: Decision rules for proving conformance or nonconformance with specifications*

NOTE : Corresponding International Standard: ISO 14253-1 *Geometrical Product Specifications (GPS)—Inspection by measurement of workpieces and measuring equipment—Part 1: Decision rules for proving conformance or non-conformance with specifications*

JIS B 0642 *Geometrical product specifications (GPS)—General concepts and requirements for GPS measuring equipment*

NOTE : Corresponding International Standard: ISO 14978 *Geometrical product specifications (GPS)—General concepts and requirements for GPS measuring equipment*

JIS B 0680 *Geometrical Product Specifications (GPS)—Standard reference temperature for geometrical product specification and verification*

NOTE : Corresponding International Standard: ISO 1 *Geometrical Product Specifications (GPS)—Standard reference temperature for geometrical product specification and verification*

JIS B 7503 *Mechanical dial gauges*

JIS B 7506 *Gauge blocks*

JIS B 7513 *Precision surface plates*

JIS B 7526 *Squares*

JIS B 7533 *Dial test indicators (lever type)*

JIS B 7536 *Electrical comparators*

JIS C 0920 *Degrees of protection provided by enclosures (IP Code)*

NOTE : Corresponding International Standard: IEC 60529 *Degrees of protection provided by enclosures (IP Code)*

JIS Z 8103 *Glossary of terms used in measurement*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS B 0641-1**, **JIS B 0642** and **JIS Z 8103** together with the following apply.

3.1 height gauge

measuring instrument in which a slider with a scribe or measuring stylus moves relative to a measuring scale on a beam and in which this motion is along a single vertical axis nominally perpendicular to a reference plane on the instrument base

NOTE 1 Height gauges are designed to be used with surface plates in which the reference plane of the height gauge is placed in contact with the surface plate.

NOTE 2 Various types of measuring scales on the beam with appropriate indication are possible, such as analogue indication, including vernier and circular scales, and digital indication.

NOTE 3 Most height gauges are capable of using various types of measuring styli, including a scribe.

NOTE 4 Height gauges are sometimes equipped with motorized motion of the slider, while on others the slider can only be moved by hand (manually).

NOTE 5 Height gauges are sometimes equipped with a device to control the measuring force.

NOTE 6 Height gauges are sometimes designed only for measuring distances parallel to the beam while others have measuring devices which allow for more complex measurements, including scanning functions and measurements perpendicular to the beam.

3.2 measuring face contact

contact between the measuring face and a feature of a workpiece

3.2.1 full measuring face contact

contact between the full area of the measuring face and a feature of a workpiece

3.2.2 partial measuring face contact

contact between a partial area of the measuring face and a feature of a workpiece

3.3 error of indication

indication of height gauge minus a true value of the corresponding input quantity

NOTE : The conventional true value is used because it is impracticable to determine a true value.

4 Design specification (design characteristics)

4.1 General

The general design specification (design characteristics) of the height gauge shall be such that its metrological characteristics comply with the requirements of this Standard under all operational orientations, unless otherwise specified by the manufacturer or supplier.

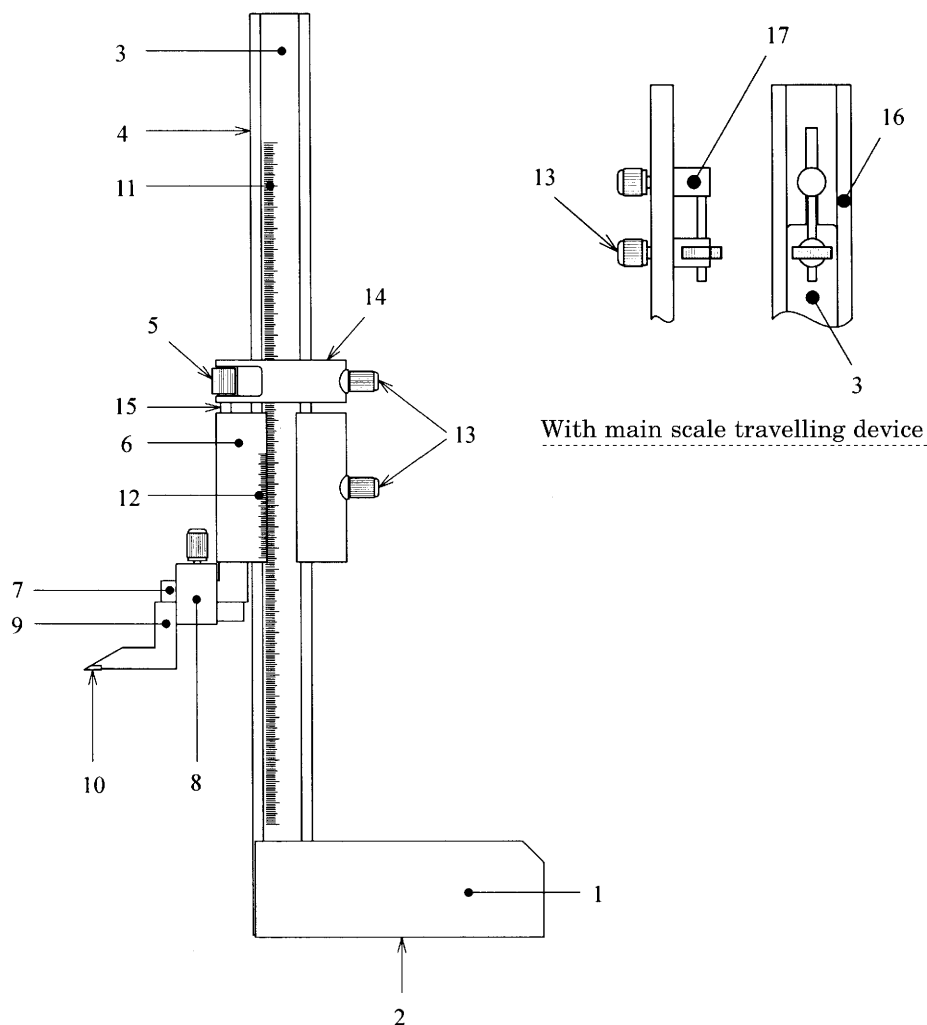
An example of data sheet for specification marking in the case of providing the information for users is given in Annex B.

4.2 Names of main parts

Two examples of height gauge having typical design characteristics: for vernier height gauge and digital height gauge are shown below.

Names of main parts are as given in Figures 1 and 2.

The figures are intended to indicate the names but not intended to give the design details.



- | | | |
|-----------------------------------|--------------------------|---------------------------------|
| 1 instrument base | 7 probe extension | 13 locking devices |
| 2 instrument base reference plane | 8 fixing device | 14 fine adjustment |
| 3 beam | 9 scribe | 15 fine adjustment screw thread |
| 4 guiding face | 10 scribe measuring face | 16 pillar |
| 5 fine adjustment wheel | 11 main scale | 17 main scale travelling device |
| 6 slider | 12 vernier scale | |

Figure 1 Example and nomenclature of height gauge with vernier scale

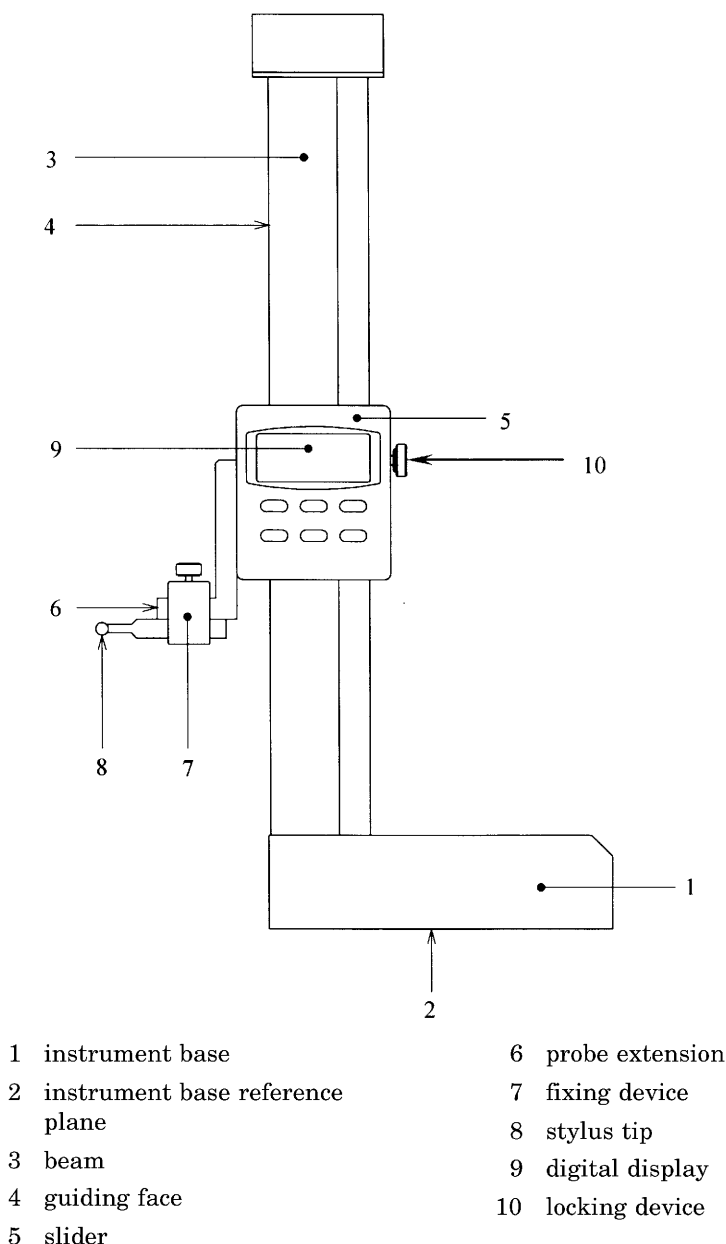


Figure 2 Example and nomenclature of height gauge with digital indication

4.3 Dimensions

As a minimal requirement, the manufacturer shall specify the main dimensions as shown in Figure 3.

Typical data sheet in the case of giving the dimensions of height gauge to the user as product information is given in Annex B.

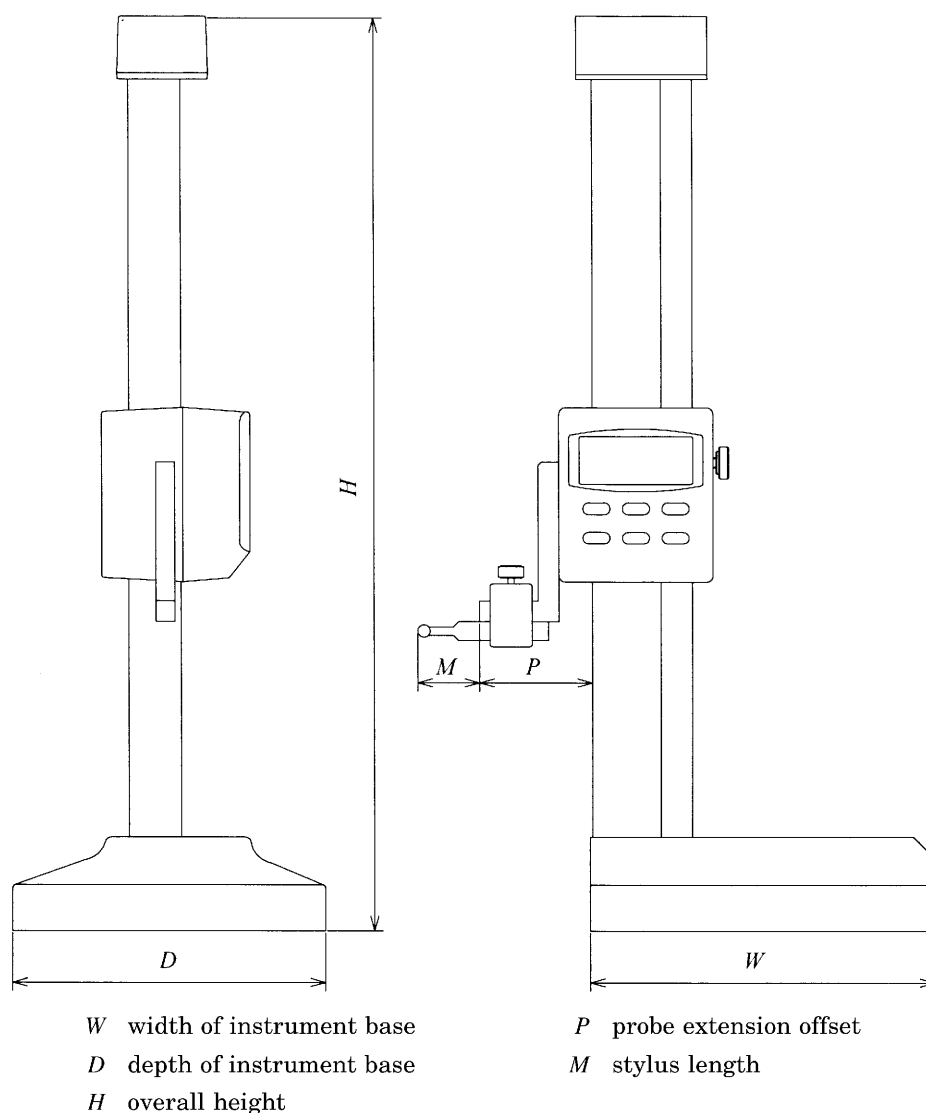


Figure 3 Symbols of main dimensions for height gauge

4.4 Types of indicating devices

4.4.1 General

Types of indicating devices are analogue indicating devices with a vernier scale or circular scale, or digital indicating devices with digital display.

On height gauges with analogue indicating devices, the scale interval or the minimum reading, and its unit shall be labelled.

On height gauges with digital indicating devices, the unit of the indication shall be labelled.

4.4.2 Analogue indicating devices

4.4.2.1 General

In the case of instruments with vernier scale, the scale interval on the beam shall be 1 mm. The main scale shall be longer, by at least one vernier scale length, than the measuring range of the instrument.