

SLOVENSKI STANDARD
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01-november-2017

Specifikacija geometrijskih veličin izdelka (GPS) - Oprema za merjenje dimenzij - 1. del: Konstrukcija in meroslovne karakteristike kljunastih meril (ISO/DIS 13385-1:2017)

Geometrical product specifications (GPS) - Dimensional measuring equipment - Part 1: Design and metrological characteristics of callipers (ISO/DIS 13385-1:2017)

Geometrische Produktspezifikation (GPS) - Längenmessgeräte - Teil 1: Messschieber; Konstruktionsmerkmale und messtechnische Anforderungen (ISO/DIS 13385-1:2017)

Spécification géométrique des produits (GPS) - Équipement de mesure dimensionnel - Partie 1: Caractéristiques de conception et caractéristiques métrologiques des pieds à coulisse (ISO/DIS 13385-1:2017)

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Geometrical product specifications (GPS) — Dimensional measuring equipment —

Part 1: Design and metrological characteristics of callipers

*Spécification géométrique des produits (GPS) — Équipement de mesurage dimensionnel
— Partie 1: Caractéristiques de conception et caractéristiques métrologiques des pieds à coulisse*

ICS: 17.040.30

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ISO/DIS 13385-1:2017(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*.

This second edition cancels and replaces the first edition (ISO 13385-1:2011), which has been technically revised.

The main changes compared to the previous edition are as follows:

A list of all parts in the ISO 13385 series can be found on the ISO website.

Introduction

This document is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO 14638). It influences the chain links for measuring equipment and calibration on size and distance in the general GPS matrix (see [Annex C](#)).

The ISO/GPS Masterplan given in ISO 14638 gives an overview of the ISO/GPS system of which this document is a part. The fundamental rules of ISO/GPS given in ISO 8015 apply to this document and the default decision rules given in ISO 14253-1 apply to specifications made in accordance with this document, unless otherwise indicated; see ISO/TR 14253-6 for additional information on the selection of alternative decision rules.

For more detailed information on the relation of this document to other standards and the GPS matrix model, see [Annex C](#).

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Geometrical product specifications (GPS) — Dimensional measuring equipment —

Part 1: Design and metrological characteristics of callipers

1 Scope

This document provides the most important design and metrological characteristics of callipers

- with analogue indication: vernier scale or circular scale (dial), and
- with digital indication: digital display

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14253-1, *Geometrical product specification (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 1: Decision rules for proving conformance or non-conformance with specifications*

ISO 14253-5, *Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 5: Uncertainty in verification testing of indicating measuring instruments*

ISO/TR 14253-6, *Geometrical product specifications (GPS) — Inspection by measurement of workpieces and measuring equipment — Part 6: Generalized decision rules for the acceptance and rejection of instruments and workpieces*

ISO/DIS 14978:2017, *Geometrical Product Specifications (GPS) — General concepts and requirements for GPS measurement equipment*

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO/IEC Guide 99:2007, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/DIS 14978:2017, ISO/IEC Guide 99:2007 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

ISO/DIS 13385-1:2017(E)

3.1 calliper

measuring instrument which evaluates a dimensional quantity of an internal or external feature on the basis of opposing contact from the movement of a slider with a measuring jaw, moving relative to a measuring scale on a rigid beam and a fixed jaw

Note 1 to entry: See examples in [Figures 1, 2](#) and [3](#).

Note 2 to entry: Callipers may be equipped for additional measurements, such as depth and step measurements (see [Figures 1](#) and [2](#)).

Note 3 to entry: The indication may be either analogue (vernier scale or circular scale) or digital.

3.2 measuring face contact

contact between the measuring face and an integral feature of a workpiece

3.2.1 full measuring face contact

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

3.2.2 partial measuring face contact

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

3.2.3 measuring face line contact

contact between a line, nominally perpendicular to the length of the jaws, on the measuring face and an integral feature of a workpiece

4 Design characteristics

4.1 General design and nomenclature

See [Figures 1, 2](#) and [3](#) for general design.

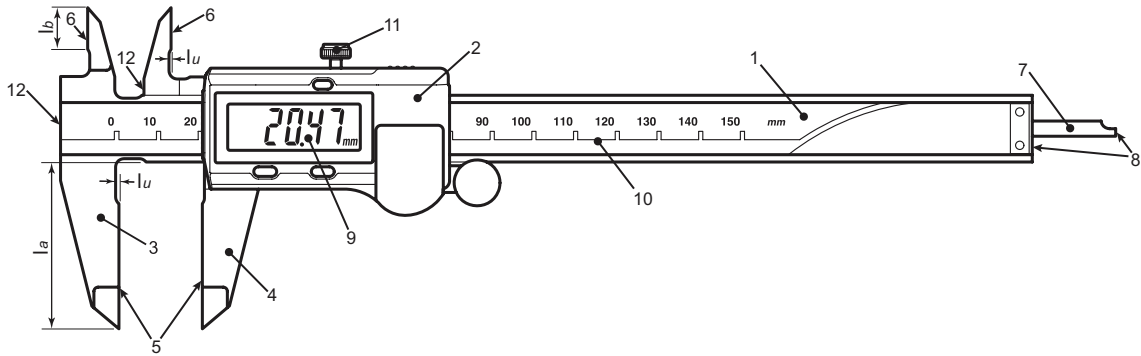
The design shall follow the general guidelines in ISO/DIS 14978:2017 including the common design characteristics in ISO/DIS 14978:2017, Annex D.

The scale interval of the main scale on the beam of a calliper with a vernier scale shall be 1 mm. In the case of callipers with circular scales, the scale interval on the beam shall be either 1 mm or 2 mm.

4.2 Dimensions

The manufacturer shall state important calliper design dimensions, such as those shown in [Table 1](#). See [Annex B](#). The values shown in [Table 1](#) are typical dimensions of the elements of callipers and are not requirements of this document. [Table 1](#) does not include the length of the undercut, l_u , which is typically kept as small as practicable.

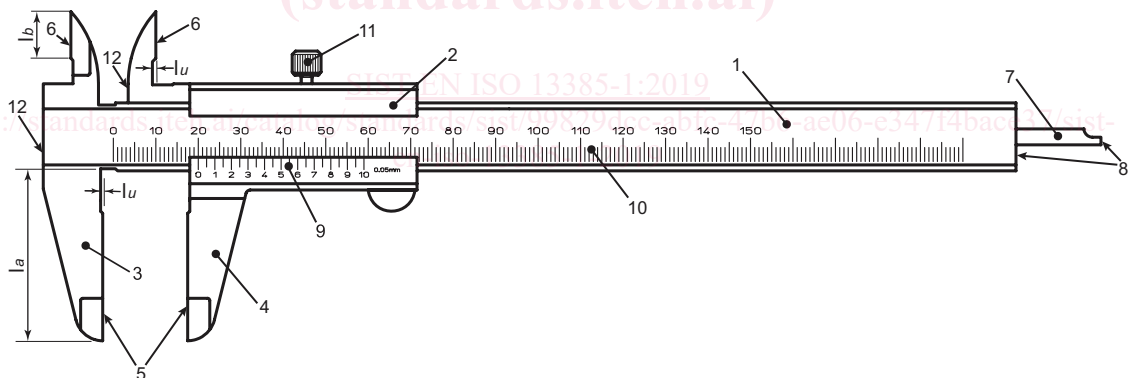
For callipers equipped with a depth measuring rod, the manufacturer shall state the cross-sectional dimensions of the rod, e.g. $\varnothing 1,5$ mm for round or 1,2 mm x 3 mm for rectangular.



Key

- | | |
|---|---|
| 1 beam | 8 measuring faces for depth measurement |
| 2 slider | 9 digital display |
| 3 fixed (measuring) jaw | 10 main scale |
| 4 sliding (measuring) jaw | 11 locking screw |
| 5 measuring faces for external measurements | 12 measuring faces for step measurement |
| 6 measuring faces for internal measurements (crossed knife-edge faces) | l_a length of jaw |
| 7 depth measuring rod | l_b length of jaw for internal measurements |
| | l_u undercut depth |

Figure 1 — Example design of digital callipers for external, internal, depth and step measurement



Key

- | | |
|---|---|
| 1 beam | 8 measuring faces for depth measurement |
| 2 slider | 9 vernier scale |
| 3 fixed (measuring) jaw | 10 main scale |
| 4 sliding (measuring) jaw | 11 locking screw |
| 5 measuring faces for external measurements | 12 measuring faces for step measurement |
| 6 measuring faces for internal measurements (crossed knife-edge faces) | l_a length of jaw |
| 7 depth measuring rod | l_b length of jaw for internal measurements |
| | l_u undercut depth |

Figure 2 — Example design of vernier callipers for external, internal, depth and step measurement