

# INTERNATIONAL STANDARD

**ISO**  
**10104**

First edition  
1990-12-15

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## **Assembly tools for screws and nuts — Double-headed, deep offset and modified offset, box wrenches**

*Outils de manœuvre pour vis et écrous — Clés polygonales doubles  
contre-coudées et contre-coudées profondes*



Reference number  
ISO 10104:1990(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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10104 was prepared by Technical Committee ISO/TC 29, *Small tools*.

Annex A of this International Standard is for information only.

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International Organization for Standardization  
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

# Assembly tools for screws and nuts — Double-headed, deep offset and modified offset, box wrenches

## 1 Scope

This International Standard specifies the minimum overall length and the maximum head thickness for double-headed, deep offset and modified offset, box wrenches complying with the test torque, series A, of ISO 1711:1975/Amd. 1:1982<sup>1)</sup>.

Double-headed deep offset and modified offset, box wrenches are listed under numbers 10 and 11 in ISO 1703.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of ap-

plying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 691:1983, *Wrench and socket openings — Metric series — Tolerances for general use.*

ISO 1711:1975, *Hand operated wrenches and sockets — Technical specifications.*

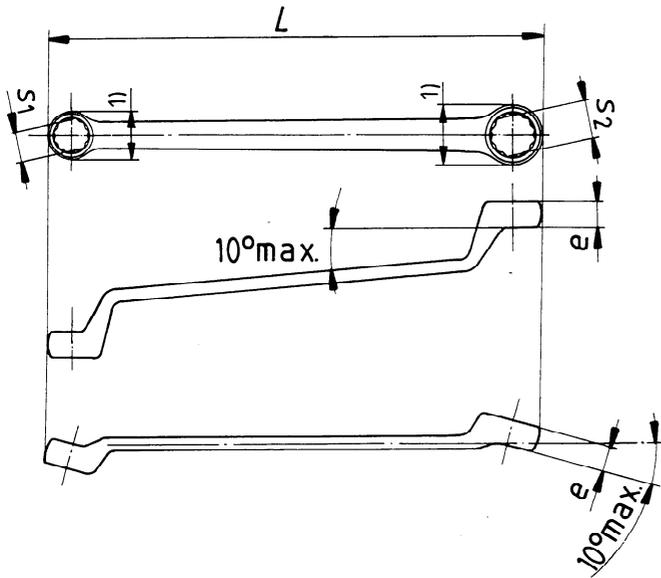
ISO 3318:1990, *Assembly tools for screws and nuts — Double-headed open-ended wrenches, double-headed ring wrenches and combination wrenches — Maximum widths of heads.*

## 3 Dimensions

See figure 1 and table 1.

NOTE 1 Figure 1 of this International Standard is only an example and should not influence the design of the wrenches.

1) The document is referred to in clause 2 as ISO 1711:1975.



1) Overall dimensions of heads in accordance with ISO 3318, with the exception of the width across flats 20 mm, 23 mm, 25 mm and 28 mm.

Figure 1

Table 1

Dimensions in millimetres

Pairing <sup>1) 2)</sup> $s_1 \times s_2$	$L$ <sup>3)</sup>	
	min.	$e$ <sup>4)</sup> max.
(6 × 7)	134	7
7 × 8	143	7,5
(8 × 9)	152	8,5
8 × 10	152	9
(9 × 11)	161	9,5
10 × 11	170	9,5
10 × 13	170	11
11 × 13	179	11
(12 × 13)	188	11
(13 × 14)	197	11
13 × 15	197	12
(13 × 16)	197	12
(13 × 17)	197	13
(14 × 15)	206	12
15 × 16	215	12
(15 × 18)	215	13
(16 × 17)	224	13
16 × 18	224	13
(17 × 19)	233	14
(18 × 19)	242	14
18 × 21	242	14
(19 × 22)	251	15
(20 × 22)	260	15
(21 × 22)	269	15
(21 × 23)	269	15
21 × 24	269	16
(22 × 24)	278	16
24 × 27	296	17
(24 × 30)	296	18
(25 × 28)	305	17,5
27 × 30	323	18
(27 × 32)	323	19
(30 × 32)	330	19
30 × 34	330	20
(32 × 34)	348	20
(32 × 36)	348	21
34 × 36	366	21
36 × 41	384	22
41 × 46	429	24
46 × 50	474	25
50 × 55	510	27
55 × 60	555	28,5

1) The pairings are those "recommended" and "less recommended" (in parentheses) by ISO 1085.

2) The tolerances on openings  $s_1$  and  $s_2$  shall comply with ISO 691.

3)  $L_{\min} = s_1 \times 9 + 80$ , for (6 × 7) to (27 × 32)  
 $= s_1 \times 9 + 60$ , for (30 × 32) to 55 × 60

where  $s_1$  is the smaller opening.

4)  $e_{\max} = 2 \times s_2^{0,65}$

where  $s_2$  is the bigger opening.

**Annex A**  
(informative)

**Bibliography**

- [1] ISO 1085:1986, *Assembly tools for screws and nuts — Double-ended wrenches — Size pairing.*
- [2] ISO 1703:1983, *Assembly tools for screws and nuts — Nomenclature.*

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