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IS 2029 (1998): Ring Wrenches (Spanners) [PGD 5: Assembly Hand Tools]



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भारतीय मानक
छल्ला रिंच (पाने) — विशिष्टि
(चौथा पुनरीक्षण)

Indian Standard
RING WRENCHES (SPANNERS) —
SPECIFICATION
(*Fourth Revision*)

ICS 25.140.30

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Metal Forming Machines Sectional Committee had been approved by the Production Engineering Division Council.

This standard was first published in 1962, revised in 1971 and the second revision was published in 1981. The third revision of the standard was taken up to bring it in line with IS 6131:1980 and IS 2027:1980 in 1991. The ring wrenches (spanners) having non-preferred width across flats at both ends were deleted and many sizes which found prevalent use in the country were also included.

While revising this standard two tables in accordance with ISO 10103:1990, and ISO 10104:1990 have been included in order to align this standard with international practices.

While preparing this standard, assistance has been derived from:

ISO 10103:1990	Assembly tools for screws and nuts — Double headed, flat and offset, box wrenches.
ISO 10104:1990	Assembly tools for screws and nuts — Double headed, deep offset and modified offset, box wrenches.
DIN 837:1987	Box wrenches, double head with unequal openings, test torque series <i>B</i> , issued by Deutsches Institut für Normung (DIN).
DIN 838:1987	Box wrenches, double head, deep offset, with unequal openings; test torque series <i>A</i> , issued by Deutsches Institut für Normung (DIN).
DIN 897:1987	Box wrenches, double end, modified offset, with unequal openings, test torque series <i>A</i> , issued by Deutsches Institut für Normung (DIN).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2:1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

RING WRENCHES (SPANNERS) — SPECIFICATION (Fourth Revision)

1 SCOPE

This standard covers the requirements of forged, double-ended ring wrenches (spanners) of cranked, straight, angled and offset types conforming to torque series *A* and *B* of IS 6131.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
2027:1992	Spanners and sockets widths across flats (<i>second revision</i>)
3748:1990	Tool and die steels (<i>second revision</i>)
6131:1980	Technical requirements for hand-operated wrenches (spanners) and sockets (<i>first revision</i>)

3 DIMENSIONS

3.1 The dimensions of ring wrenches (spanners) of cranked, straight, angled and offset types shall be as given in Tables 1 to 5.

3.2 The widths across flats and the corresponding tolerances for the ring wrenches (spanners) shall be in accordance with IS 2027.

3.3 The illustrations are diagrammatic only and are not intended to indicate details of design.

4 MATERIAL

For the manufacture of ring wrenches (spanners) suitable alloy steels shall be used which, after suitable heat-treatment, fulfil the requirements of hardness and torque test as laid down in 5 and 6. Suitable steel for the manufacture of ring wrenches (spanners) is T50Cr4V2 of IS 3748 respectively.

5 HARDNESS

5.1 The ring wrenches (spanners) shall be hardened over entire length and the hardness measured at any point on the wrench shall be within the limits specified in IS 6131.

5.2 For size combinations with width across flat at one end above 32 mm (inclusive), the hardness value shall be 345 HV (35 HRC), Min.

Example:

Wrenches (spanners) of nominal width across flat combinations of 30 mm × 36 mm and 32 mm × 36 mm shall have a hardness of 345 HV (35 HRC), Min.

6 WORKMANSHIP AND FINISH, SAMPLING, TORQUE TESTING AND PRESERVATION AND PACKING

These requirements shall be in accordance with IS 6131. The test torque values for ring wrenches (spanners) shall conform to series 'A' if made of alloy steel and series 'B' if made of carbon steel, as specified in IS 6131.

7 DESIGNATION

7.1 The designation of a ring wrench (spanner) shall indicate:

- a) commonly used name;
- b) torque series (*see* IS 6131);
- c) type ('C' for cranked, 'S' for straight, 'A' for angled, and 'O' for offset);
- d) nominal widths across flats in millimetres; and
- e) IS Number.

Example 1:

A cranked double-ended ring wrench (spanner) conforming to torque series *A*, having nominal widths across flats $S_1 = 8$ and $S_2 = 10$ shall be designated as follows:

Ring Spanner IS 2029 – *A* series – C – 8 × 10

Example 2:

A straight double-ended ring wrench (spanner) conforming to torque series *B*, having nominal widths across flats $S_1 = 13$ and $S_2 = 17$ shall be designated as follows:

Ring Spanner IS 2029 – *B* series – S – 13 × 17

8 MARKING

8.1 Wrenches (spanners) shall be indelibly marked/ stamped with the nominal width of across flat(s) on their respective ends, and the manufacturer's name, initials/trade-mark.

8.2 BIS Certification Marking

Each wrench (spanner) may also be marked with the Standard Mark.

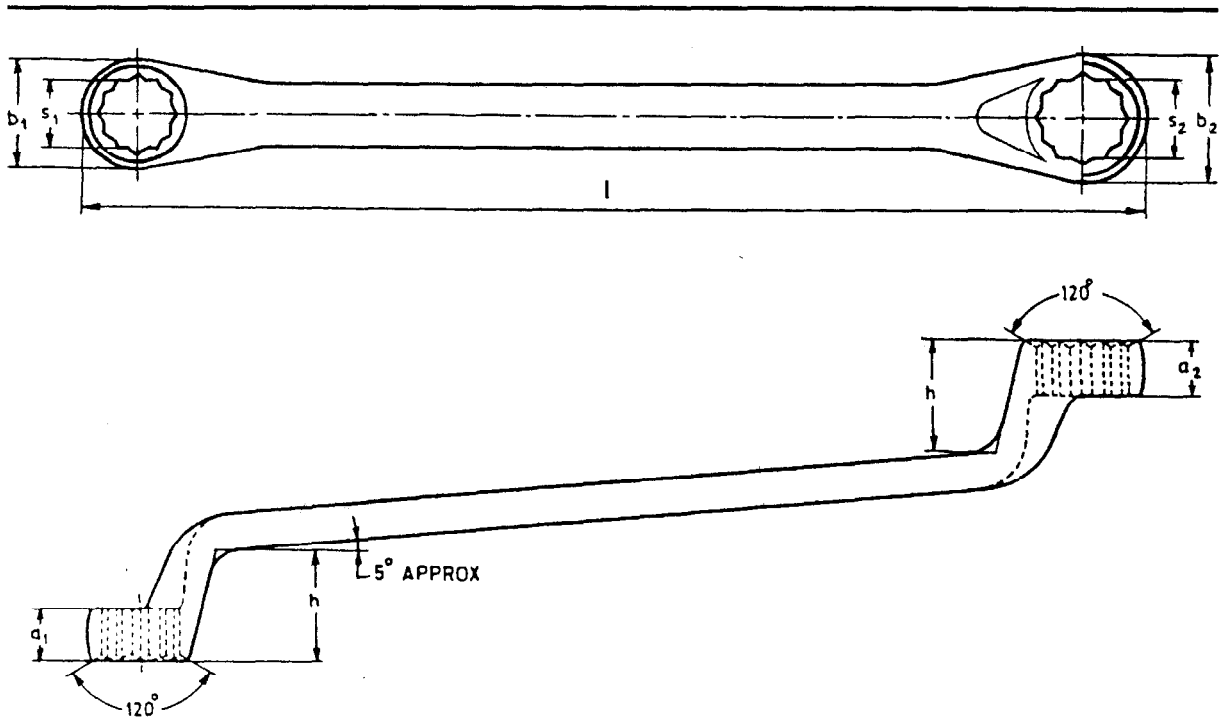
8.2.1 The use of the Standard Mark is governed by

the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Table 1 Dimensions for Cranked Double-Ended Ring Wrenches (Spanners)

(Clause 3.1)

All dimensions in millimetres.



Nominal Width Across Flats $S_1 \times S_2$	a_1	a_2	b_1	b_2	h		l	
	Max	Max	Max	Max	Max	Min	Max	Min
6 × 7	6	7	11	12.5	22	18	185	165
7 × 8	6	7	12.5	14	23	19	190	170
8 × 9	7	8	14	15.5	23	19	200	180
8 × 10	7	9	14	17	24	20	200	180
10 × 11	9	10	17	18.5	25	21	210	190
10 × 13	9	11	17	21.5	27	23	230	210
11 × 13	10	11	18.5	21.5	27	23	235	210
12 × 13	10	11	20	21.5	27	23	235	210
12 × 14	10	12	20	23	27	23	235	210
13 × 14	11	12	21.5	23	28	24	250	220
13 × 15	11	12	21.5	24	28	24	250	220
13 × 16	11	12	21.5	26	28	24	260	230
13 × 17	11	13	21.5	27	30	26	270	240
14 × 15	11	12	23	24	28	24	250	220
14 × 17	12	13	23	27	30	26	270	240
16 × 17	12	13	26	27	30	26	270	240

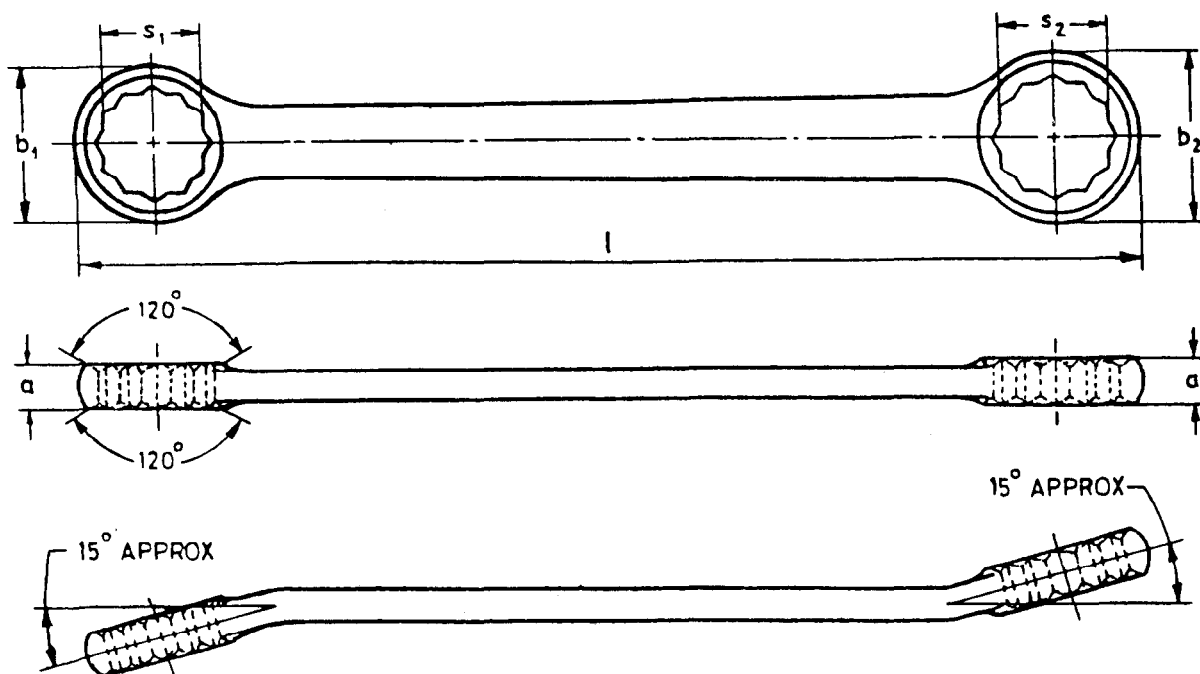
Table 1 (Concluded)

Nominal Width Across Flats $S_1 \times S_2$	a_1	a_2	b_1	b_2	h		l	
	Max	Max	Max	Max	Max	Min	Max	Min
16 × 18	12	13	26	29	31	27	285	250
17 × 19	13	14	27	30	32	28	295	260
18 × 19	13	14	29	30	32	28	295	260
18 × 21	13	14	29	33	33	29	310	275
19 × 22	14	15	30	35	34	30	320	285
19 × 24	14	16	30	38	34	30	335	300
20 × 22	14	15	32	35	34	30	320	285
21 × 23	14	15	33	37	34	30	335	300
21 × 24	14	16	33	38	35	31	340	305
22 × 24	15	16	35	38	36	32	340	305
24 × 26	15	16	38	41	36	32	355	320
24 × 27	15	16	38	42	36	32	355	320
24 × 30	15	17	38	46	37	33	355	320
25 × 28	15	16	40	44	37	33	355	320
27 × 30	16	17	42	46	37	33	355	320
27 × 32	16	18	42	49	38	34	380	340
30 × 32	17	19	46	49	39	35	390	350
30 × 34	17	20	46	52	39	35	425	370
30 × 36	17	20	46	55	40	36	450	395
32 × 36	18	20	49	55	40	36	450	395
34 × 36	20	21	52	55	42	37	470	415
36 × 41	20	22	55	63	46	40	490	435
41 × 46	22	24	63	71	46	40	515	460
46 × 50	24	25	71	77	49	43	565	500

Table 2 Dimensions for Straight and Angled Double-Ended Ring Wrenches (Spanners)

(Clause 3.1)

All dimensions in millimetres.



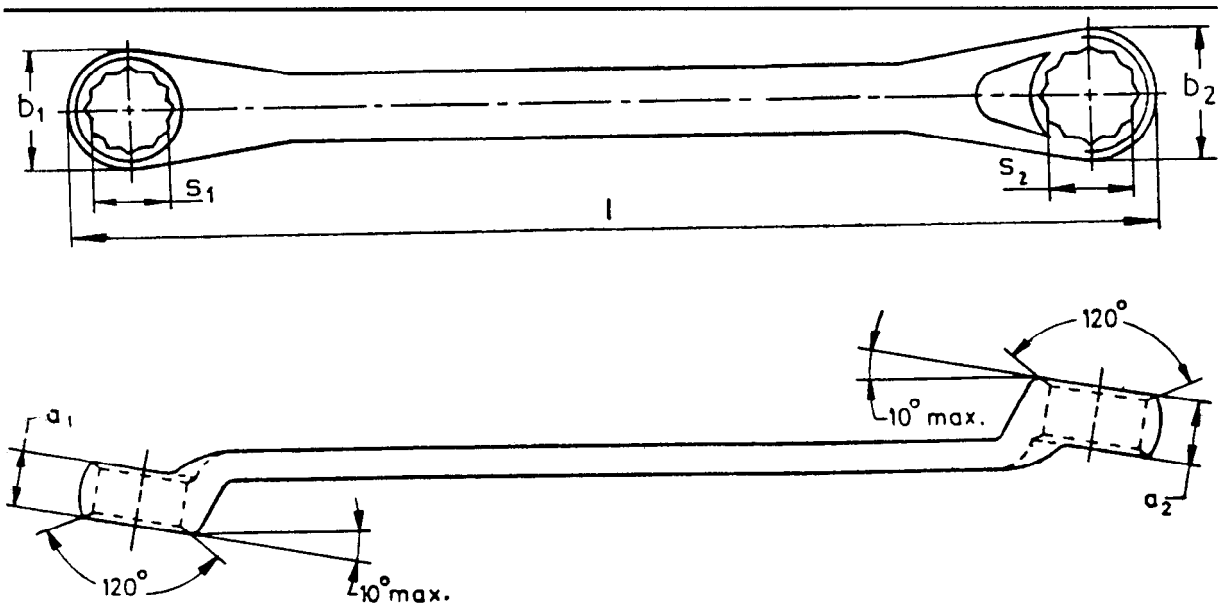
Nominal Width Across Flats $S_1 \times S_2$	a	b_1	b_2	l	
	Max	Max	Max	Max	Min
6 × 7	5	10	11.5	100	80
7 × 8	6	11.5	13	115	95
8 × 9	6	13	14.5	115	95
8 × 10	6	13	16	125	105
10 × 11	7	16	17	135	115
10 × 13	8	16	20.5	150	130
11 × 13	8	17	20.5	150	130
12 × 13	8	19	20.5	150	130
12 × 14	8	19	21.5	165	130
13 × 14	8	20.5	21.5	165	130
13 × 16	9	20.5	24.5	165	130
13 × 17	9	20.5	25.5	170	140
14 × 15	8	21.5	23	165	130
14 × 17	9	21.5	25.5	175	140
16 × 17	9	24.5	25.5	175	140
16 × 18	10	24.5	27	180	145
17 × 19	10	25.5	28	190	150

Table 2 (Concluded)

Nominal Width Across Flats $S_1 \times S_2$	a	b_1	b_2	l	
	Max	Max	Max	Max	Min
18 × 19	10	27	28	190	150
18 × 21	11	27	30.5	200	160
19 × 22	11	28	32.5	210	175
20 × 22	12	29.5	32.5	210	175
21 × 23	12	30.5	33.5	235	190
21 × 24	12	30.0	35.5	235	190
22 × 24	12	32.5	35.5	235	200
24 × 26	12	35.5	38	285	220
24 × 27	12	35.5	39	290	220
24 × 30	13	35.5	43.5	310	240
25 × 28	13	36.5	41	290	220
27 × 30	14	39	43.5	325	270
27 × 32	14	39	46	325	270
30 × 32	14	43.5	46	325	270
30 × 34	15	43.5	49	335	280
30 × 36	15	43.5	51.5	360	305
32 × 36	15	46	51.5	360	305
34 × 36	15	49	51.5	360	305
36 × 41	16	51.5	59	395	340
41 × 46	17	59	66	435	380
46 × 50	17	66	71.5	480	415

Table 3 Dimensions for Double-Ended Offset Ring Wrenches (Spanners)
(Clause 3.1)

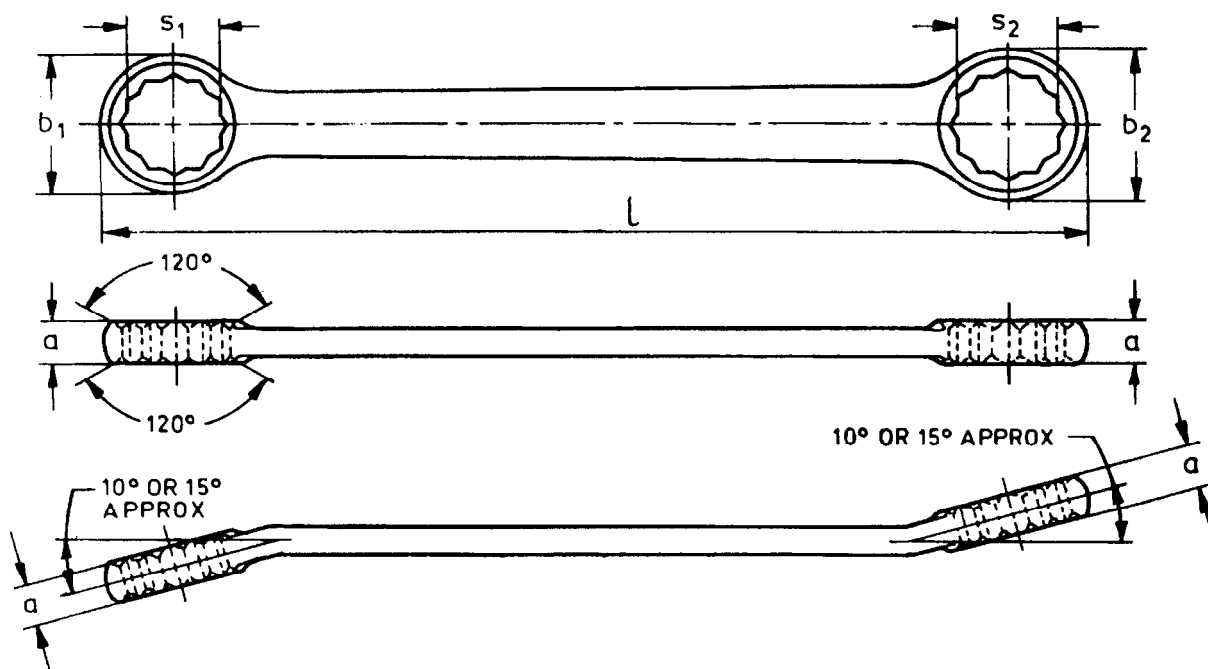
All dimensions in millimetres.



Nominal Width Across Flats $S_1 \times S_2$	a_1	a_2	b_1	b_2	l	
	Max	Max	Max	Max	Max	Min
6 × 7	6	7	11	12.5	170	135
7 × 8	7	8	12.5	14	175	140
8 × 9	7	8	14	15.5	180	145
8 × 10	7	9	14	17	180	145
10 × 11	9	10	17	18.5	200	165
10 × 13	9	11	17	21.5	205	170
11 × 13	10	11	18.5	21.5	205	170
12 × 13	10	11	20	21.5	210	175
12 × 14	10	12	20	23	210	175
13 × 16	11	12	21.5	26	220	185
13 × 17	11	13	21.5	27	255	220
14 × 15	11	12	23	24	235	200
14 × 17	12	13	23	27	255	220
16 × 17	12	13	26	27	260	225
16 × 18 _v	12	13	26	29	275	235
17 × 19	13	14	27	30	290	245
18 × 19	13	14	29	30	290	245
18 × 21	13	14	29	33	305	260
19 × 22	14	15	30	35	320	275
20 × 22	14	15	32	35	320	275
21 × 23	14	15	33	37	355	310
22 × 24	15	16	35	38	355	310
24 × 27	16	17	38	42	410	360
25 × 28	17	18	40	44	410	360
27 × 32	18	20	42	49	460	400
30 × 32	18	20	46	49	460	400
30 × 34	18	20	46	52	500	440

Table 4 Dimensions for Double-Headed, Flat and Offset Box Wrenches (Spanners) — ISO Series
(Clause 3.1)

All dimensions in millimetres.



Nominal Width ¹⁾ Across Flats $S_1 \times S_2$	$a^{2)}$ Max	$b^{3)}$ Max	$b_z^{3)}$ Max	$l^{4)}$ Min
6 × 7	6.5	11	12.5	73
7 × 8	7	12.5	14	81
8 × 9	7.5	14	15.5	89
8 × 10	8	14	17	89
9 × 11	8.5	15.5	18.5	97
10 × 11	8.5	17	18.5	105
10 × 13	9.5	17	21.5	105
11 × 13	9.5	18.5	21.5	113
12 × 13	9.5	20	21.5	121
13 × 14	9.5	21.5	23	129
13 × 15	10	21.5	24.5	129
13 × 16	10.5	21.5	26	129
13 × 17	11	21.5	27.5	129
14 × 15	10	23	24.5	137
15 × 16	10.5	24.5	26	145
15 × 18	11.5	24.5	29	145
16 × 17	11	26	27.5	153

Table 4 (Concluded)

Nominal Width ¹⁾ Across Flats $S_1 \times S_2$	$a^{2)}$ Max	$b^{3)}$ Max	$b_2^{3)}$ Max	$L^{4)}$ Min
16 × 18	11.5	26	29	153
17 × 19	11.5	27.5	30.5	166
18 × 19	11.5	29	30.5	174
18 × 21	12.5	29	33.5	174
19 × 22	13	30.5	35	182
20 × 22	13	32	35	190
21 × 22	13	33.5	35	198
21 × 23	13	33.5	36.5	198
21 × 24	13.5	33.5	38	198
22 × 24	13.5	35	38	206
24 × 27	14.5	38	42.5	222
24 × 30	15.5	38	47	222
25 × 28	15	39.5	44	230
27 × 30	15.5	42.5	47	246
27 × 32	16	42.5	50	246
30 × 32	16	47	50	275
30 × 34	16.5	47	53	275
32 × 34	16.5	50	53	291
32 × 36	17	50	56	291
34 × 36	17	53	56	307
36 × 41	18.5	56	63.5	323
41 × 46	20	63.5	71	363
46 × 50	21	71	77	403
50 × 55	22	77	84.5	435
55 × 60	23.5	84.5	92	475

¹⁾ The tolerances on corresponding widths across flats for forged and subsequently machined spanners shall be as specified in IS 2027.

²⁾ $a \text{ Max} = 2 \times S_2^{0.6}$ where S_2 is the bigger opening.

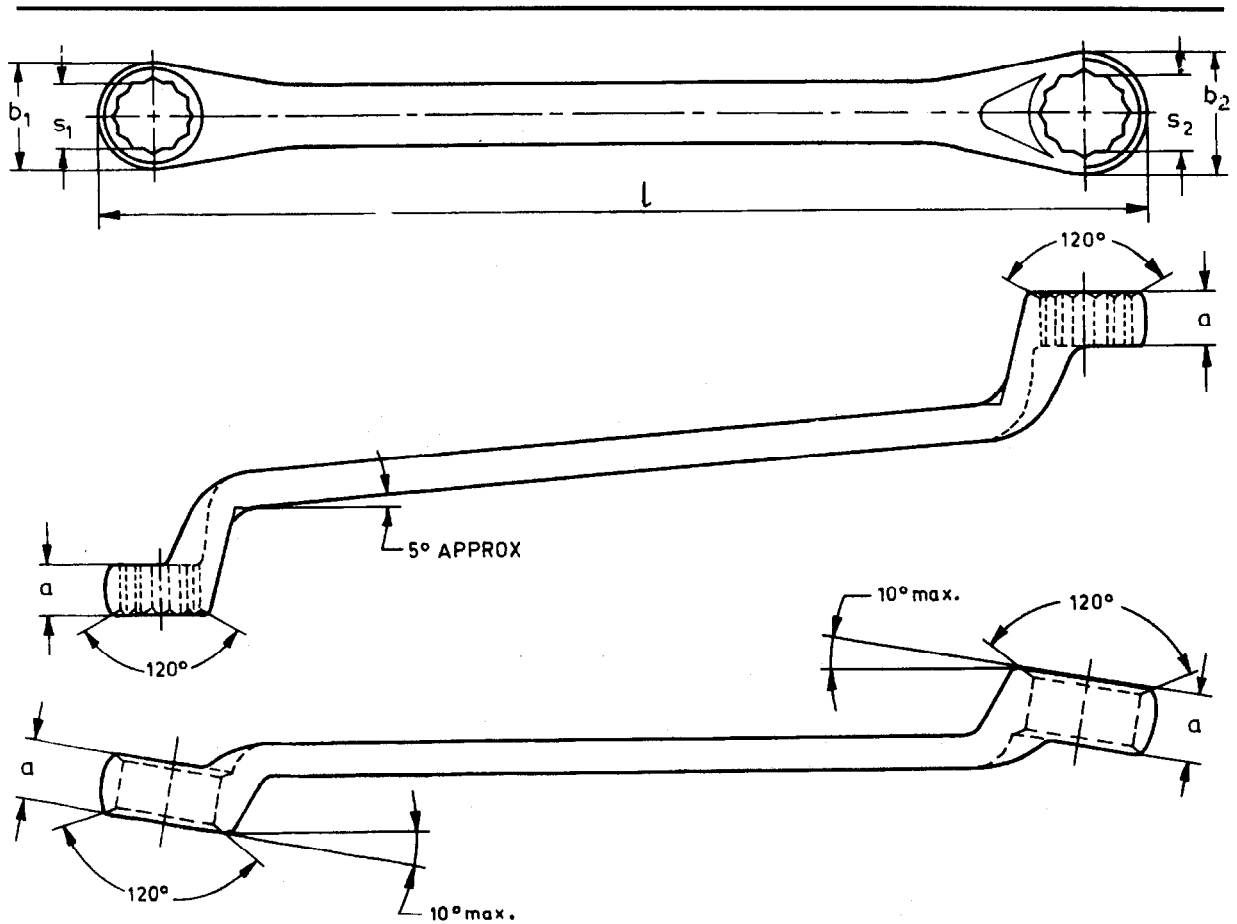
³⁾ $b_1 \text{ Max} \approx 1.5 S_1 + 2$ and $b_2 \text{ Max} \approx 1.5 S_2 + 2$

The dimensions of b_1 and b_2 specified in the standard for the corresponding widths across flats are derived from the ISO 3318:1990 'Assembly tools for screws and nuts — Double-headed open-ended wrenches, double-headed ring wrenches and combination wrenches — Maximum width of heads'.

⁴⁾ $L \text{ Min} = S_1 \times 8 + 25$ for (6×7) to (16×18)
 $= S_1 \times 8 + 30$ for (17×19) to (27×32)
 $= S_1 \times 8 + 35$ for (30×32) to (55×60)
 where S_1 is the smaller opening.

Table 5 Dimensions for Double-Headed Deep Offset and Modified Offset Box Wrenches (Spanners) — ISO Series
(Clause 3.1)

All dimensions in millimetres.



Nominal Width ¹⁾ Across Flats $S_1 \times S_2$	$a^{2)}$ Max	$b_1^{3)}$ Max	$b_2^{3)}$ Max	$l^{4)}$ Min
6 × 7	7	11	12.5	134
7 × 8	7.5	12.5	14	143
8 × 9	8.5	14	15.5	152
8 × 10	9	14	17	152
9 × 11	9.5	15.5	18.5	161
10 × 11	9.5	17	18.5	170
10 × 13	11	17	18.5	170
11 × 13	11	17	21.5	179
12 × 13	11	20	21.5	188
13 × 14	11	21.5	23	197
13 × 15	12	21.5	24.5	197
13 × 16	12	21.5	26	197

Table 5 (Concluded)

Nominal Width ¹⁾ Across Flats $S_1 \times S_2$	$a^{2)}$ Max	$b_1^{3)}$ Max	$b_2^{3)}$ Max	$L^{4)}$ Min
13 × 17	13	21.5	27.5	197
14 × 15	12	23	24.5	206
15 × 16	12	24.5	26	215
15 × 18	13	24.5	29	215
16 × 17	13	26	27.5	224
16 × 18	13	26	29	224
17 × 19	14	27.5	30.5	233
18 × 19	14	29	30.5	242
18 × 21	14	29	33.5	242
19 × 22	15	30.5	35	251
20 × 22	15	32	35	260
21 × 22	15	33.5	35	269
21 × 23	15	33.5	36.5	269
21 × 24	16	33.5	36.5	269
22 × 24	16	35	38	278
24 × 27	17	38	42.5	296
24 × 30	18	38	47	296
25 × 28	17.5	39.5	44	305
27 × 30	18	42.5	47	323
27 × 32	19	42.5	50	323
30 × 32	19	47	50	330
30 × 34	20	47	53	330
32 × 34	20	50	53	348
32 × 36	21	50	56	348
34 × 36	21	53	56	366
36 × 41	22	56	63.5	384
41 × 46	24	63.5	71	429
46 × 50	25	71	77	474
50 × 55	27	77	84.5	510
55 × 60	28.5	84.5	92	555

¹⁾ The tolerances on corresponding widths across flats for forged and subsequently machined spanners shall be as specified in IS 2027.

²⁾ $a \text{ Max} = 2 \times S_2^{0.65}$ where S_2 is the bigger opening.

³⁾ $b_1 \text{ Max} \approx 1.5 S_1 + 2$ and $b_2 \text{ Max} \approx 1.5 S_2 + 2$

The dimensions of b_1 and b_2 specified in the standard for the corresponding widths across flats are derived from the ISO 3318:1990 'Assembly tools for screws and nuts — Double-headed open-ended wrenches, double-headed ring wrenches and combination wrenches — Maximum width of heads'.

(4) $L \text{ Min} = S_1 \times 9 + 80$ for (6×7) to (27×32)
 $= S_1 \times 9 + 60$ for (30×32) to (55×60)
 where S_1 is the smaller opening.

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'.

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Amendments Issued Since Publication

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