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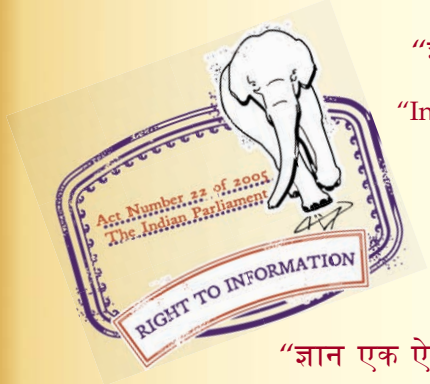
IS 2030 (1989): Box Spanners [PGD 5: Assembly Hand Tools]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 2030 : 1989
(Reaffirmed 2004)

Indian Standard

BOX SPANNERS — SPECIFICATION

(Second Revision)

First Reprint OCTOBER 1994

UDC 621.883.16

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 1990

Price Group 3

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards on 3 November 1989, after the draft finalized by the Assembly Hand Tools Sectional Committee had been approved by the Production Engineering Division Council.

This standard was first issued in 1962. The first revision was taken up to base the pairing of double-ended box spanners on ISO Recommendation ISO/R 1085 : 1969 'Combinations of double-ended wrench gaps', issued by the International Organization for Standardization (ISO). Advantage of that revision had been taken to give the dimensions of single-ended and double-ended tubular and solid box spanners separately. The requirements relating to hardness and torque test had been based on ISO Recommendation ISO/R 1711 : 1970 'Hand operated wrenches and sockets, technical specification'.

Box spanners are commonly used for the assembly of threaded fasteners in the workshops and in automobile industry. These spanners are used with a tommy bar which passes through the hole in the body of the spanners. They find a preference over the conventional types of spanners with handles in places where sides are obstructed and accessibility is poor.

Box spanners are manufactured from steel tube or solid bar by forging, but they are not finished by machining across the flats. This necessitates a liberal tolerance on the width across flats when compared with the open jaw or ring spanners.

This standard deals with the requirements of box spanners of single and double-ended types, made from tubes or solid bars which are used with a tommy bar. It does not cover the box spanners provided with universal joint or socket spanners. The sizes are suitable for use with nuts and bolts conforming to relevant Indian Standards.

This revision has been taken up in order to include many sizes which are commonly being used. Test torque values have been deleted and for that, reference of IS 6131 : 1980 'Technical requirements for hand operated wrenches (spanners) and sockets (*first revision*), has been included. Reference of latest available standards has also been made.

While preparing this standard, assistance has been derived from the following revised standards issued by the Deutsches Institut für Normug (DIN):

DIN 659 : 1982 Tee handled socket wrenches, tubular single end,

DIN 896 : 1976 (Teil 1) Tee handled socket wrenches, double end,

DIN 896 : 1976 (Teil 2) Tee handled socket wrenches, tubular double end,

DIN 899 : 1980 Technical specifications, hand operated wrenches and sockets, and

DIN 3112 : 1982 Tee handled socket wrenches, single ended.

Maximum outside head dimensions d, d_1, d_2, e, e_1, and e_2, have been aligned with ISO 2236 : 1982. 'Assembly tools for screws and nuts — Forged and tubular socket wrenches — Maximum outside head dimensions', issued by the International Organization for Standardization (ISO).

AMENDMENT NO. 1 SEPTEMBER 2012
TO
IS 2030 : 1989 BOX SPANNERS — SPECIFICATION

(Second Revision)

(*Page* 1, *clause* **6.1**) — Substitute the following for the existing clause:

'**6.1** The spanners shall be hardened over the entire length and the minimum hardness measured at any point on the spanner with across flat for all sizes shall be 35 HRC.'

(*Page* 5, *Table* 4, *clause* **4.1**) — Substitute the following for the existing table below the figure:

Nominal Width Across Flats *S*1 × *S*2	a_1 ***Min***	a_2 ***Min***	b_1 ***Min***	b_2 ***Min***	d_1 ***Max***	d_2 ***Max***	d_3 ***Min***	l ***Min***	**Nominal Size of Tommy Bar***
6 × 7	5.0	6.0	8.0	9.0	10.5	11.5	5.3	100.0	5.0
7 × 8	6.0		9.0	10.0	11.5	13.0	6.3		6.0
8 × 9		7.0	10.0	11.0	13.0	14.5		105.0	
8 × 10	6.0	7.5	10.0	12.0	13.0	16.0	6.3	115.0	6.0
10 × 11	7.5	8.0	12.0	13.0	16.0	17.0			
10 × 13		9.5		15.0		20.5		135.0	
11 × 13	8.0	9.5	13.0	15.0	17.0	20.5	8.5	135.0	8.0
12 × 13	9.0		14.0		19.0				
12 × 14		10.0		16.0		21.0			
14 × 15	10.0	11.0	16.0	17.0	21.5	22.5	8.5	140.0	8.0
13 × 17	9.5	12.0	15.0	19.0	20.5	26.0	10.5	150.0	10.0
14 × 17	10.0		16.0		21.5				
16 × 17	11.0	12.0	18.0	19.0	24.0	26.0	10.5	150.0	10.0
17 × 19	12.0	15.0	19.0	21.0	26.0	28.5	12.5	160.0	12.0
18 × 19	13.0		20.0	21.0	27.5				
19 × 22	15.0	16.0	21.0	24.0	28.5	32.0	12.5	170.0	12.0
20 × 22			22.0		29.5				
19 × 24		19.0	21.0	26.0	28.5	34.5	14.5	180.0	14.0
21 × 23	15.0	17.0	24.0	25.0	30.5	33.0	14.5	180.0	14.0
22 × 24	16.0	19.0		26.0	32.0	34.5			
24 × 26	19.0	21.0	26.0	28.0	34.5	37.5		190.0	
24 × 27	19.0	21.0	26.0	28.0	34.5	42.0	14.5	190.0	14.0
24 × 30		22.0		31.0		46.0	16.5	200.0	16.0
25 × 28		21.0	27.0	29.0	35.5	39.0			
27 × 30	21.0	22.0	29.0	31.0	42.0	46.0	16.5	205.0	16.0
27 × 32		26.0		33.0		49.0			
27 × 34									
30 × 32	22.0		31.0		46.0				
30 × 34	22.0	27.0	31.0	36.0	46.0	50.0	18.5	220.0	18.0
30 × 36									
32 × 34	26.0		34.0		49.0				
32 × 36									
36 × 41	27.0	30.0	36.0	39.0	50.0	56.0		240.0	

Nominal Width Across Flats *S*1 × *S*2	a_1 ***Min***	a_2 ***Min***	b_1 ***Min***	b_2 ***Min***	d_1 ***Max***	d_2 ***Max***	d_3 ***Min***	***l*** ***Min***	**Nominal Size of Tommy Bar***
41 × 46	30.0	33.0	40.0	44.0	56.0	62.0	21.0	260.0	20.0
46 × 50	33.0	35.0	44.0	47.0	62.0	68.0		280.0	
50 × 55	35.0	38.0	47.0	51.0	68.0	75.0		300.0	

* Conforming to IS 6002 : 1971

Indian Standard

BOX SPANNERS — SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard covers the dimensions and other requirements for single and double-ended box spanners made from solid bar or tubular section of steel for use with a tommy bar conforming to IS 6002 : 1971 'Tommy bars for box spanners'.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
1570 (Part 2) : 1979	Schedules for wrought steels for general engineering purposes: Part 2 Carbon steels (unalloyed steels)
2027 : 1980	Width across flats for spanners and sockets (*second revision*)
2500 (Part 1) : 1973	Sampling inspection tables: Part 1 Inspection by attributes and by count of defects (*first revision*)
3749 : 1978	Tool and die steels for cold work (*first revision*)
6002 : 1971	Tommy bars for box spanners
6131 : 1980	Technical requirements for hand operated wrenches (spanners) and sockets (*first revision*)

3 TYPES

3.1 Solid Box Spanner

A single- or double-ended box spanner made from a solid steel bar.

3.2 Tubular Box Spanner

A single- or double-ended box spanner made from tubular section of steel.

4 DIMENSIONS

4.1 The dimensions for box spanners shall be as given in Tables 1 to 4.

4.2 The tolerances on width across flats for the spanners shall be in accordance with IS 2027 : 1980 and shall conform to the tolerances as specified for unmachined spanners.

5 MATERIAL

5.1 Box spanners shall be manufactured from only those alloyed or unalloyed steels which after suitable heat treatment, meet the requirements of hardness and torque test as laid down in 6 and 10. Some of the suitable materials for the manufacture of box spanners are 40C8 of IS 1570 (Part 2) : 1979 and T50Cr4 v 2 as specified in IS 3749 : 1978.

6 HARDNESS

6.1 The spanners shall be hardened over the entire length and the hardness measured at any point on the spanner shall be within the limits specified below:

a) Up to and including 32 mm width across flats — 39 to 44 HRC

b) Over 32 mm width across flats — 35 to 44 HRC

NOTE — Spanners of nominal width across flats of 30×36 mm and 32×36 mm shall have the hardness corresponding to (b) above.

6.2 The box spanners shall not be case-hardened.

7 WORKMANSHIP AND FINISH

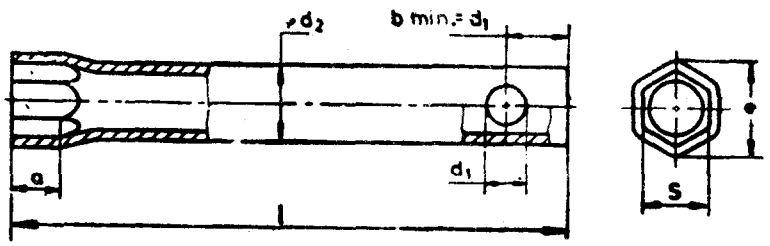
7.1 The spanners shall be well forged to shape and finished smooth all over. All sharp corners shall be removed. The spanners shall be free from burrs, cracks, seams or other manufacturing defects. The body and the hexagon shall be in good alignment and the ends shall be square with the axis.

7.2 Box shall be protected against rust by plating them with nickel, chromium or zinc; or by any other suitable process at the option of the purchaser.

Table 1 Dimensions for Single-Ended Tubular Box Spanners

(*Clause* 4.1)

All dimensions in millimetres.



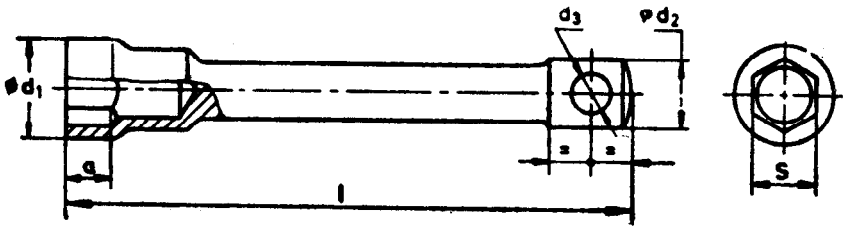
Nominal Width Across Flats S	a Min	d_1 Min	d_2 Max	e Max	l Max	l Min	Nominal Size of Tommy Bar*
6	5	5·3	11	10·5	110	100	5
7	6			11·5			
8		6·3	12	13			6
9	7			14·5			
10	7.5		13	16	125	115	
11	8		14	17			
13	9.5	8·5	16	20·5	145	135	8
14	10		17	21·5			
15	11		20	23	150	140	10
16	11	10·5		24·5			
17	12		22	26	155	145	
18	13	12·5		27			
19	15		28	28·5	160	150	12
21	15			30·5	165	155	
22	16			32	170	160	
24	19	14·5	32	34·5	190	175	14
27	21			38·5			
30	22	16·5		42	205	190	16
32	26		36	45	225	210	
34	26		40	48			
36	27	18·5		50			18
41	30		45	56	245	230	
46	33	21	50	62			20
50	35		55	68			
55	38		60	75			

*Conforming to IS 6002 : 1971.

Table 2 Dimensions for Single-Ended Solid Box Spanners

(*Clause* 4.1)

All dimensions in millimetres.



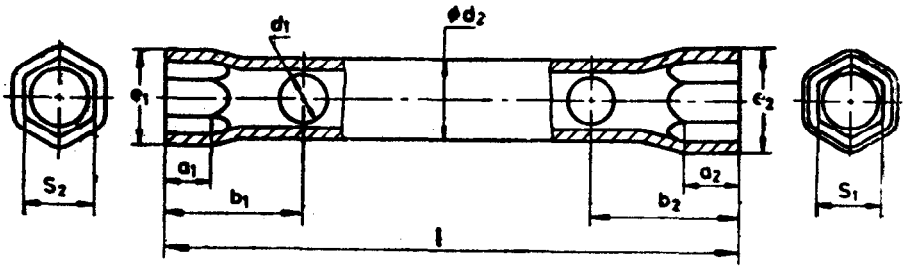
Nominal Width Across Flats *S*	*a* *Min*	d_1 *Max*	d_2 *Min*	d_3 *Min*	*l* Long Handle *Max*	*l* Long Handle *Min*	*l* Short Handle *Max*	*l* Short Handle *Min*	Nominal Size of Tommy Bar*
8	6	13	10	6·3	200	170	115	100	6
9	7	14·5							
10	7·5	16			220	190	125	110	
11	8	17	14	6·3	245	215			6
12	8	19		8·5			140	120	8
13	9·5	20·5							
14	10	21·5	14	8·5	280	240	150	130	8
15	11	23	15						10
16	11	24·5		10·5					
17	12	26	18						
18	13	27		12·5					
19	15	28·5	20		305	265	170	150	12
21	15	30·5			315	275	180	160	
22	16	32			330	290	190	170	
24	19	34·5	25	14·5	360	310	210	180	14
27	21	38·5			400	350	220	190	
30	22	42	28	16·5	450	400	230	200	16
32	26	45					250	215	
34	26	48			475	425	260	225	
36	27	50	32	18·5	500	450	270	235	18
41	30	56			560	500	285	245	
46	33	62	36	21	630	570	300	260	20
50	35	68	45	26	—	—	320	280	25
55	37	75	45	26	—	—	380	310	25
60	39	81							
65	42	88	58	33	—	—	400	350	32
70	45	94	58	33	—	—	400	350	32
75	48	101							
80	50	108							
85	53	114	70	41	—	—	450	400	40
90	55	121							
95	63	128							
100	65	135	70	41	—	—	450	400	40
105		142	80	45	—	—	500	450	45
110	68	150							
115	70	155	80	46	—	—	500	450	45
120	72	162							

*Conforming to IS 6002 : 1971.

Table 3 Dimensions for Double-Ended Tubular Box Spanners

(*Clause* 4.1)

All dimensions in millimetres.



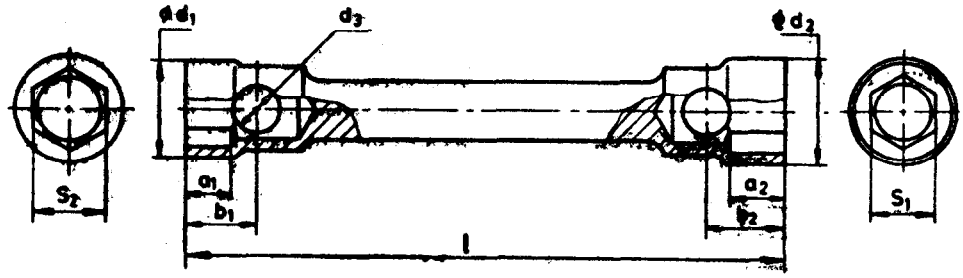
Nominal Width Across Flats $S_1 \times S_2$	a_1 Min	a_2 Min	b_1 Min	b_2 Min	d_1 Min	d_2 Max	e_1 Max	e_2 Max	l Max	l Min	Nominal Size of Tommy Bar*
6 × 7	5	6	15·5	16·5	5·3	11	10·5	11·5	110	100	5
7 × 8	6		18·5	18·5	6·3	12	11·5	13			6
8 × 9		7		19·5			13	14·5			
8 × 10	6	7·5	18·5	20	6·3	13	13	16	125	115	6
10 × 11	7·5	8	20	20·5		14	16	17			
10 × 13		9·5	24·5	26·5	8·5	16		20·5	145	135	8
11 × 13	8	9·5	25	26·5	8·5	16	17	20·5	145	135	8
12 × 13	9		26				19				
12 × 14		10		27		17		21·5			
14 × 15	10	11	27	28	8·5	20	21·5	22·5	145	135	8
13 × 17	9·5	12	30·5	33	10·5		20·5	26	155	145	10
14 × 17	10		31				21·5				
16 × 17	11	12	32	33	10·5	20	24	26	155	145	10
17 × 19	12	15	37	40	12·5	22	26	28·5	165	155	12
18 × 19	13		38				27·5				
19 × 22	15	16	40	41	12·5	28	28·5	32	175	165	12
20 × 22							29·5				
19 × 24		19	44	48	14·5		28·5	34·5	195	180	14
21 × 23	15	17	44	46	14·5	28	30·5	33	175	165	14
22 × 24	16	19	45	48			32	34·5	195	180	
24 × 26	19	21	48	49		32	34·5	37·5			
24 × 27	19	21	48	50	14·5	32	34·5	38·5	195	180	14
24 × 30		22	52	55	16·5			42	215	200	16
25 × 28		21		54			35·5	39			
27 × 30	21	22	54	55	16·5	36	38	42	215	200	16
27 × 32		26		59				45			
27 × 34											
30 × 32	22		55				42				
30 × 34	22	27	59	64	18·5	40	42	50	236	220	18
30 × 36											
32 × 34	26		63				45				
32 × 36											
36 × 41	27	30	64	67	21	45	50	56	255	240	20
41 × 46	30	33	72	75		50	56	62			
46 × 58	33	35	75	77		55	62	68			
50 × 55	35	38	77	80		60	68	75			

*Conforming to IS 6002 : 1971.

Table 4 Dimensions for Double-Ended Solid Box Spanners

(*Clause* 4.1)

All dimensions in millimetres.



Nominal Width Across Flats $S_1 \times S_2$	a_1 Min	a_2 Min	b_1 Min	b_2 Min	d_1 Max	d_2 Max	d_3 Min	l Max	l Min	Nominal Size of Tommy Bar*
6 × 7	5	6	8	9	10·5	11·5	5·3	110	100	5
7 × 8	6		9	10	11·5	13	6·3			6
8 × 9		7	10	11	13	14·5		115	105	
8 × 10	6	7·5	10	12	13	16	6·3	125	115	6
10 × 11	7·5	8	12	13	16	17				
10 × 13		9·5		15		20·5		145	135	
11 × 13	8	9·5	13	15	17	20·5	8·5	145	135	8
12 × 13	9		14		19					
12 × 14		10		16		21				
14 × 15	10	11	16	17	21·5	22·5	8·5	150	140	8
13 × 17	9·5	12	15	19	20·5	26	10·5	160	150	10
14 × 17	10		16		21·5					
16 × 17	11	12	18	19	24	26	10·5	160	150	10
17 × 19	12	15	19	21	26	28·5	12·5	170	160	12
18 × 19	13		20		27·5					
19 × 22	15	16	21	24	28·5	32	12·5	180	170	12
20 × 22			22		29·5					
19 × 24		19	21	26	28·5	34·5	14·5	190	180	14
21 × 23	15	17	24	25	30·5	33	14·5	190	180	14
22 × 24	16	19		26	32	34·5				
24 × 26	19	21	26	28	34·5	37·5		200	190	
24 × 27	19	21	26	28	34·5	38·5	14·5	200	190	14
24 × 30		22		31		42	16·5	210	200	16
25 × 28		21	27	29	35·5	39				
27 × 30	21	22	29	31	38·5	42	16·5	220	205	16
27 × 32		26		33		45				
27 × 34										
30 × 32	22		31		42					
30 × 34	22	27	31	36	42	50	18·5	235	220	18
30 × 36										
32 × 34	26		34		45					
32 × 36										
36 × 41	27	30	36	39	50	56		255	240	
41 × 46	30	33	40	44	56	62	21	280	260	20
46 × 50	33	35	44	47	62	68		300	280	
50 × 55	35	38	47	51	68	75		320	300	

*Conforming to IS 6002 : 1971.

8 TOMMY BARS

8.1 The spanners shall be provided with holes for tommy bars as shown in the relevant tables. The tommy bar shall conform to IS 6002 : 1971. If two holes are required for single-ended solid box spanners (*see* Table 2); the location of holes shall be as shown in Fig. 1.

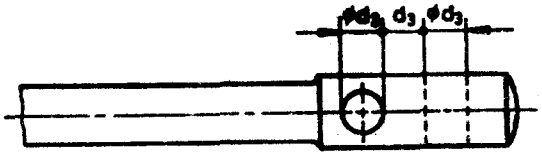


FIG. 1 LOCATION OF HOLES ON SINGLE-ENDED SOLID BOX SPANNERS

8.2 The tommy bars shall be a separate item and shall not be supplied with the spanner unless specifically ordered.

9 SAMPLING

9.1 Lot

In any consignment, all the box spanners of the same size manufactured from the same material under similiar conditions of production shall be grouped together to constitute a lot.

9.2 For ascertaining the conformity of the lot, the procedure for sampling and inspection as given in IS 2500 (Part 1) : 1973 shall be followed. The type of sampling plan, inspection level and acceptable quality level (AQL) to be followed for various characteristics shall be as given in **9.2.1** and **9.2.2.**

9.2.1 For ascertaining the conformity for dimensions, designation, workmanship and finish and tommy bar requirements, a single sampling plan with inspection level IV and AQL of 1·5 percent as given in Tables 1 and 2 of IS 2500 (Part 1) : 1973 shall be followed.

9.2.2 For hardness and torque tests, a single sampling plan with inspection level II and AQL of 1·5 percent as given in Tables 1 and 2 of IS 2500 (Part 1) : 1973 shall be followed.

10 TEST

10.1 Torque Test

The torque test shall be carried out in a manner as specified in IS 6131 : 1980.

10.1.1 The box wrenches (spanners) shall meet the torque test requirements of series A if made of alloy steel or series B if made of carbon steels, as specified in IS 6131 : 1980. At the completion of the test, the spanners shall show no sign of any damage or permanent deformation.

11 DESIGNATION

11.1 The box spanners shall be designated by its commonly used name, solid or tubular, double-ended (DE for double-ended and SE for single-ended), width across flats, type of handle in case of single-ended solid box spanners (*L* for long handle, S for short handle), and number of this standard.

Example:

A single-ended tubular box spanner having a nominal width across flat 10 mm shall be designated as follows:

Tubular Box Spanner SE 10 IS 2030

A double-ended solid box spanner on nominal size 10 × 11 mm shall be designated as follows:

Solid Box Spanner DE 10 × 11 IS 2030

12 MARKING

12.1 Each spanner shall be legibly and indelibly marked with the nominal width across flats near their respective ends and the manufacturer's name, initials or trade-mark.

Example:

A double-ended spanner having nominal widths across flats S_1 = 24 mm and S_2 = 27 mm shall be marked 24 and 27 near the respective ends and the manufacturer's name on the body.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

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 a 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 Addition'.

This Indian Standard has been developed from Doc: No. PE 05 (4869)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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(Common to all Offices)

Regional Offices:	**Telephones**
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola CALCUTTA 700054	37 84 99, 37 85 61 37 86 26, 37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	53 38 43, 53 16 40 53 23 84
Southern : C.I.T. Campus, IV Cross Road, MADRAS 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 430093	632 92 95, 632 78 58 632 78 91, 632 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. PATNA. THIRUVANANTHAPURAM.

Reprography Unit, BIS, New Delhi, India