इंटरनेट मानक

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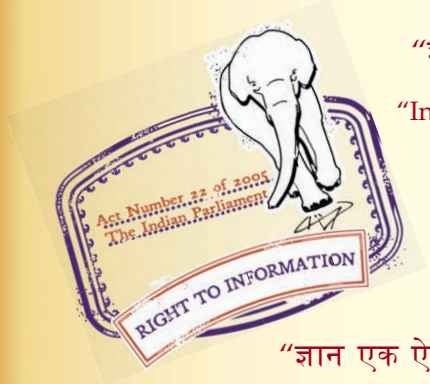

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विद्युत कार्यों के लिए नलिका — विद्युत संस्थापन के लिए नलिकाओं का बाहरी व्यास और नलिकाओं और फिटिंग के लिए चूड़ियाँ — विशिष्टि

Indian Standard

CONDUITS FOR ELECTRICAL PURPOSES — OUTSIDE DIAMETERS OF CONDUITS FOR ELECTRICAL INSTALLATION AND THREADS FOR CONDUITS AND FITTINGS — SPECIFICATION

ICS 29.120.10

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

March 2000

Price Group 4

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Electrical Wiring Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

This standard covers the requirements of outside diameter for conduits used in electrical installations. It also covers the dimensional requirements for threads of conduits. In addition to the conduits, the standard specifies the requirements for threads used in associated fittings. The mechanical performance of the threaded parts of the conduit system will be a function of material and wall thickness which is specified in appropriate product standards on conduits and conduit fittings.

While preparing this standard considerable assistance has been derived from IEC Pub 423 (1993) issued by the International Electrotechnical Commission (IEC).

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

CONDUITS FOR ELECTRICAL PURPOSES — OUTSIDE DIAMETERS OF CONDUITS FOR ELECTRICAL INSTALLATION AND THREADS FOR CONDUITS AND FITTINGS — SPECIFICATION

1 SCOPE

This standard specifies outside diameters for counduits used in electrical installations and the dimensional requirements for threads. It also specifies the dimensional requirements for threads used in associated fittings.

It is not applicable to extra heavy-duty rigid steel conduits. (Separate Indian Standard is under consideration.)

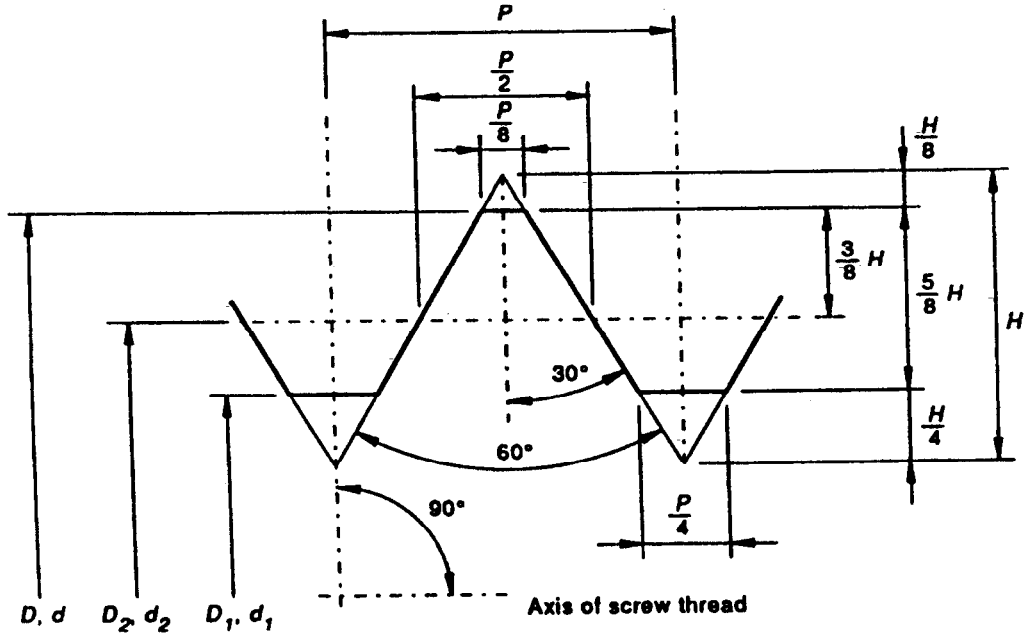
2 REFERENCES

Following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
4218 (Part 1) : 1976	ISO metric screw thread: Part 1 Basic and design profiles (*first revision*)
2334 : 1975	Gauging practice for ISO metric screw thread (*first revision*)

3 OUTSIDE DIAMETERS AND THREAD

The outside diameters, tolerances and details of external and internal metric threads are given in Table 1. Details of the thread form are given in Fig. 1, which is based on IS 4218 (Part 1).



$H = 0.866\,03\,P$
H = Pas/Pitch

FIG. 1 BASIC PROFILE OF SCREW THREADS

Table 1 Outside Diameters for Conduits and Thread Details for Conduits and Associated Fittings

(*Clause* 3)

Outside Diameters and Thread for Conduits				External Threads						Internal Threads				
Outside Diameters	Metric Threads	Class of Fit	Pitch	Major Diameter (d)		Effective Diameter (d_2)		Minor Diameter (d_1)		Major Diameter (D)	Effective Diameter (D_2)		Minor Diameter (D_1)	
				Max	*Min*	*Max*	*Min*	*Max*	*Min*	*Min*	*Max*	*Min*	*Max*	*Min*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
6+0/–0.1	M6	6 g/6 H	0.75	5.978	5.838	5.491	5.391	5.058	4.929	6.000	5.645	5.513	5.378	5.188
8+0/–0.2	M8	8 g/7 H	1.00	7.974	7.694	7.324	7.144	6.747	6.528	8.000	7.540	7.350	7.217	6.917
10+0/–0.2	M10	8 g/7 H	1.00	9.974	9.694	9.324	9.144	8.747	8.528	10.000	9.540	9.350	9.217	8.917
12+0/–0.3	M12	8 g/7 H	1.50	11.968	11.593	10.994	10.770	10.128	9.846	12.000	11.262	11.026	10.751	10.376
16+0/–0.3	M16	8 g/7 H	1.50	15.968	15.593	14.994	14.770	14.128	13.846	16.000	15.262	15.026	14.751	14.376
20+0/–0.3	M20	8 g/7 H	1.50	19.968	19.593	18.994	18.770	18.128	17.846	20.000	19.262	19.026	18.751	18.376
25+0/–0.4	M25	8 g/7 H	1.50	24.968	24.593	23.994	23.758	23.128	22.834	25.000	24.276	24.026	23.751	23.376
32+0/–0.4	M32	8 g/7 H	1.50	31.968	31.593	30.994	30.758	30.128	29.834	32.000	31.276	31.026	30.751	30.376
40+0/–0.4	M40	8 g/7 H	1.50	39.968	39.593	38.994	38.758	38.128	37.834	40.000	39.276	39.026	38.751	38.376
50+0/–0.4	M50	8 g/7 H	1.50	49.968	49.593	48.994	48.744	48.128	47.820	50.000	49.291	49.026	48.751	48.376
63+0/–0.4	M63	8 g/7 H	1.50	62.968	62.593	61.994	61.744	61.128	60.820	63.000	62.291	62.026	61.751	61.376
75+0/–0.4	M75	8 g/7 H	1.50	74.968	74.593	73.994	73.744	73.128	72.820	75.000	74.291	74.026	73.751	73.376

NOTES

1 All dimensions in millimetres.

2 *See also* Fig. 1.

3 Sizes 6, 8, 10 and 12 are non-preferred sizes.

4 GAUGES

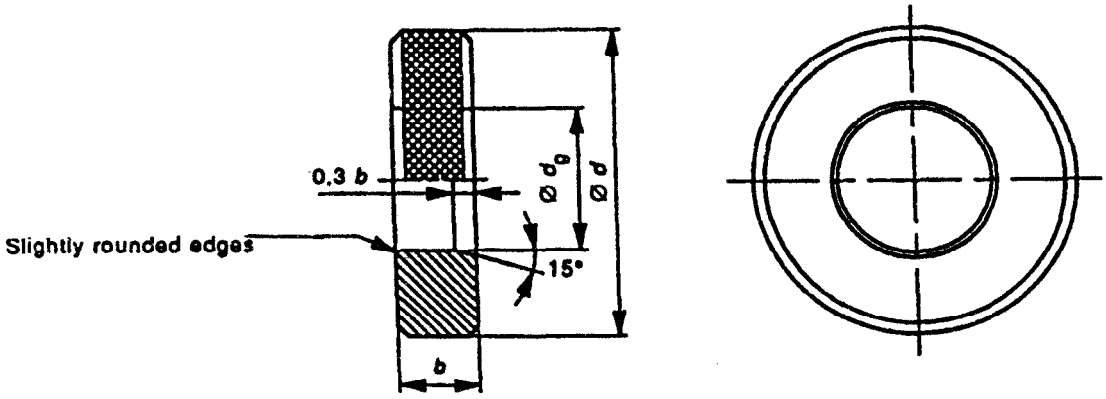
Details of gauges for checking the maximum outside diameter of conduits are given in Fig. 2. For the minimum outside diameters of conduits, details are given in Fig. 3A and 3B.

The dimensions of gauges for checking external threads are given in Table 2 and these are in accordance with IS 2334. The types of gauges are shown in Fig. 4.

The dimensions of gauges for checking internal threads are given in Table 3, and these are in accordance with IS 2334. The type of gauges are shown in Fig. 5.

5 SAMPLES OF CONDUIT

The samples shall be approximately 500 mm in length.

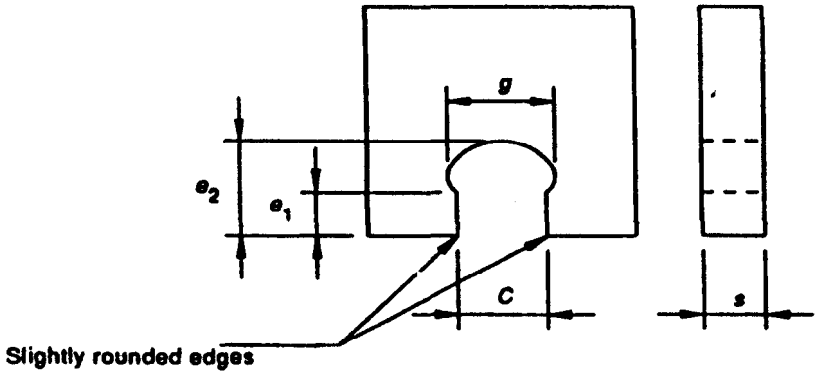


It shall be possible to slide the gauge completely over the conduit without excessive force. For conduits normally provided with a protective coating, this test may be carried out before the application of the protective coating.

Size	d_g [1] mm	*b* mm	*d* mm
6	6.04	8	32
8	8.04	8	32
10	10.04	8	32
12	12.04	10	38
16	16.04	12	45
20	20.04	12	45
25	25.04	16	60
32	32.04	18	70
40	40.04	18	70
50	50.04	20	85
63	63.04	20	100
75	75.04	24	120

[1]Manufacturing tolerance : $^{+0}_{-0.01}$ mm
Admissible wear : + 0.01 mm
Material : Steel

FIG. 2 GAUGES FOR CHECKING MAXIMUM OUTSIDE DIAMETERS OF CONDUITS

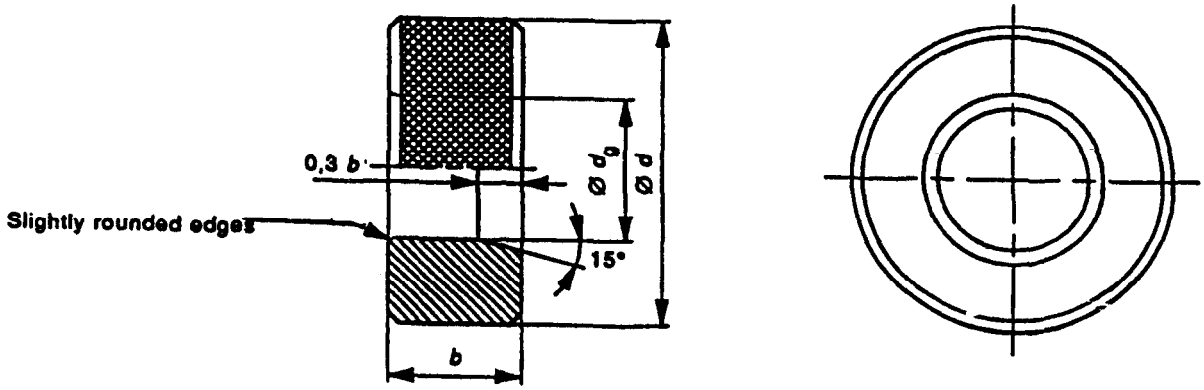


MATERIAL : STEEL

It shall not be possible to pass the gauge over the conduit, in any position, without excessive force.

Size	*C* mm	*Manufacturing Tolerance* mm	*Admissible Wear* mm	e_1 mm	e_2 mm	*g* mm	*s* mm
6	5.900	+0/–0.016	+0.016/–0	3	7	8	7
8	7.800	+0/–0.016	+0.016/–0	4	9	10	7
10	9.800	+0/–0.016	+0.016/–0	5	11	12	7
12	11.700	+0/–0.018	+0.018/–0	6	13	14	8
16	15.700	+0/–0.018	+0.018/–0	8	17	18	8
20	19.700	+0/–0.022	+0.022/–0	10	23	27	9
25	24.600	+0/–0.022	+0.022/–0	10	23	27	9
32	31.600	+0/–0.025	+0.025/–0	12	29	34	10
40	39.600	+0/–0.030	+0.030/–0	14	35	42	10
50	49.600	+0/–0.030	+0.030/–0	16	42	52	12
63	62.600	+0/–0.030	+0.030/–0	18	49	65	12
75	74.600	+0/–0.030	+0.030/–0	20	55	77	14

Fig. 3A GAUGES FOR CHECKING MINIMUM OUTSIDE DIAMETERS OF RIGID METALLIC CONDUITS



It shall not be possible to slide the gauge completely over the conduit under its own weight.

Size	d_g [1] mm	*b* mm	*d* mm
6	5.90	16	32
8	7.80	16	32
10	9.80	16	32
12	11.70	20	38
16	15.70	24	45
20	19.70	24	45
25	24.60	32	60
32	31.60	36	70
40	39.60	36	70
50	49.60	40	85
63	62.60	40	100
75	74.60	48	120

[1] Manufacturing tolerance : $^{+0}_{-0.01}$ mm
Admissible wear : + 0.01 mm
Material : Steel

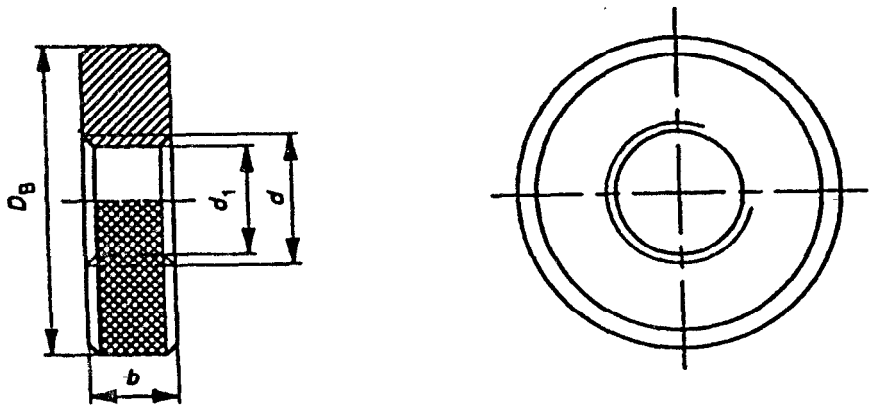
FIG. 3B GAUGES FOR CHECKING MINIMUM OUTSIDE DIAMETERS OF CONDUITS OTHER THAN RIGID METALLIC

Table 2 Dimensions of Gauges for External Threads

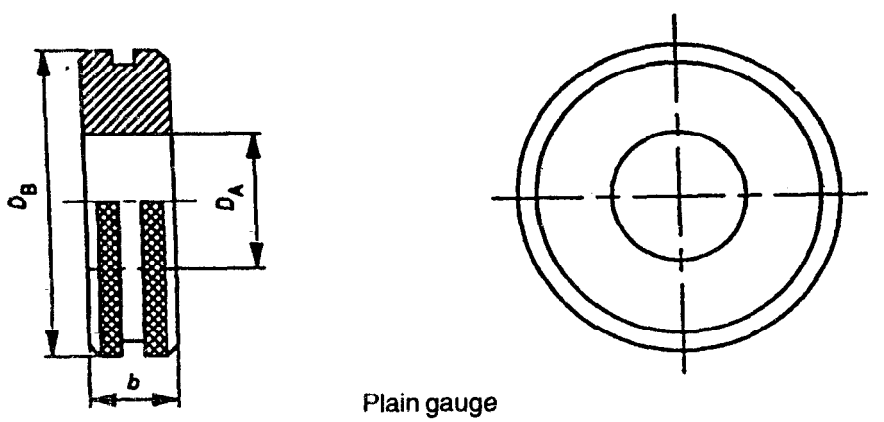
(*Clause* 4)

Designation of Gauge	Threaded Gauge								Plain Gauge		Overall Diameter of Gauge	Thickness of Gauge
	Major Diameter	Pitch Diameter	Tolerance on Pitch Diameter	Admissible Wear for Pitch Diameter	Minor Diameter	Tolerance on Minor Diameter	Manufacturing Tolerances		Diameter of Hole for Plain Gauge	Tolerance on Diameter of Hole for Plain Gauge		
							Pitch over 10 threads	Half-angle of screw threads				
	d *Min*		±		d_1	±	±	±	D_A	±	D_B	*b*
	mm	mm	mm	mm	mm	mm	mm	minutes	mm	mm	mm	mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
M6	6.041	5.489	0.007	+0.016	5.166	0.007	0.005	17	5.838	0.005	32	8
M8	8.057	7.316	0.009	+0.021	6.891	0.009	0.005	15	7.694	0.008	32	8
M10	10.057	9.316	0.009	+0.021	8.891	0.009	0.005	15	9.694	0.008	32	8
M12	12.090	10.982	0.012	+0.025 5	10.344	0.012	0.005	12	11.593	0.015	38	10
M16	16.090	14.982	0.012	+0.025 5	14.344	0.012	0.005	12	15.593	0.015	45	12
M20	20.090	18.982	0.012	+0.025 5	18.344	0.012	0.005	12	19.593	0.015	45	12
M25	25.090	23.982	0.012	+0.025 5	23.344	0.012	0.005	12	24.593	0.015	60	16
M32	32.090	30.982	0.012	+0.025 5	30.344	0.012	0.005	12	31.593	0.015	70	18
M40	40.090	38.982	0.012	+0.025 5	38.344	0.012	0.005	12	39.593	0.015	71	18
M50	50.090	48.982	0.012	+0.025 5	48.344	0.012	0.005	12	49.593	0.015	85	20
M63	63.090	61.982	0.012	+0.025 5	61.344	0.012	0.005	12	62.593	0.015	100	20
M75	75.090	73.982	0.012	+0.025 5	73.344	0.012	0.005	12	74.593	0.015	120	24

NOTE — The type of gauge is shown in Fig. 4.



Threaded gauge

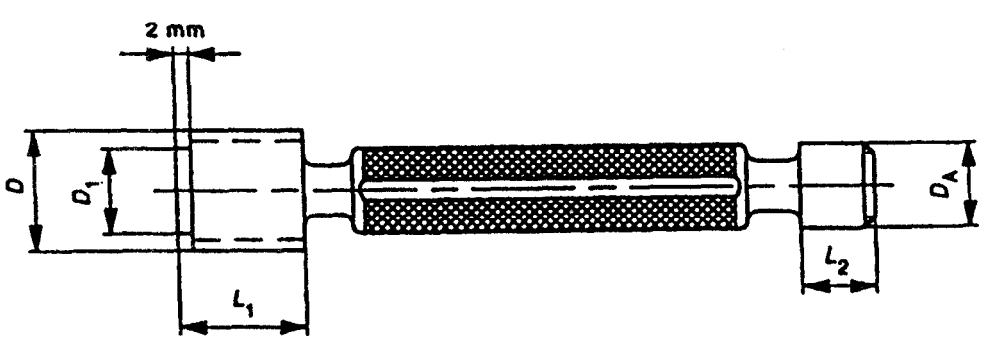


Plain gauge

It shall be possible to screw the threaded gauge onto the conduit without excessive force.

It shall not be possible to pass the plain gauge over the thread without excessive force.

FIG. 4 GO/NO GO GAUGE FOR EXTERNAL THREADS (*SEE* TABLE 2 FOR THE DIMENSIONS)



Threaded gauge

Plain gauge

It shall be possible to screw the threaded gauge into the fitting without excessive force.

It shall not be possible to insert the plain gauge into the fitting without excessive effort.

FIG. 5 GO/NO GO GAUGE FOR INTERNAL THREADS (*SEE* TABLE 3 FOR THE DIMENSIONS)

Table 3 Dimensions of Gauges for Internal Threads

(*Clause* 4)

Designation of Gauge	Threaded Gauge								Plain Gauge		Overall Length of Threaded Gauge	Overall Length of Plain Gauge
	Major Diameter	Tolerance on Major Diameter	Pitch Diameter	Tolerance on Pitch Diameter	Admissible Wear for Pitch Diameter	Minor Diameter	Manufacturing Tolerances		Diameter of Plug	Tolerance on Diameter of Plug for Plain Gauge		
							Pitch over 10 threads	Half-angle of screw threads				
	D mm	± mm	D_2 mm	± mm	mm	d_1 *Max* mm	± mm	± minutes	D_A mm	± mm	L_1 mm	L_2 mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
M6	6.012	0.011	5.525	0.005 5	+0.012 5	5.080	0.005	17	5.378	0.008	6	6
M8	8.012	0.011	7.362	0.005 5	+0.017 5	6.773	0.005	15	7.217	0.008	10	7
M10	10.012	0.011	9.362	0.005 5	+0.017 5	8.773	0.005	15	9.217	0.008	10	7
M12	12.016	0.014	11.042	0.007	+0.021	10.160	0.005	12	11.751	0.008	12	8
M16	16.016	0.014	15.042	0.007	+0.021	14.160	0.005	12	14.751	0.008	14	10
M20	20.016	0.014	19.042	0.007	+0.021	18.160	0.005	12	18.751	0.008	14	12
M25	25.016	0.014	24.042	0.007	+0.021	23.160	0.005	12	23.751	0.008	14	14
M32	32.016	0.014	31.042	0.007	+0.021	30.160	0.005	12	30.751	0.008	15	15
M40	40.016	0.014	39.042	0.007	+0.021	38.160	0.005	12	38.751	0.008	15	15
M50	50.016	0.014	49.042	0.007	+0.021	48.160	0.005	12	48.751	0.008	18	18
M63	63.016	0.014	62.042	0.007	+0.021	61.160	0.005	12	61.751	0.008	18	18
M75	75.016	0.014	74.042	0.007	+0.021	73.160	0.005	12	73.751	0.008	18	18

NOTE — The type of gauge is shown in Fig. 5.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 323 01 31, 323 94 02, 323 33 75

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices: Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002 — 323 76 17, 323 38 41

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054 — 337 84 99, 337 85 61, 337 86 26, 337 86 62

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022 — 60 38 43, 60 20 25

Southern : C. I. T. Campus, IV Cross Road, CHENNAI 600113 — 235 02 16, 235 04 42, 235 15 19, 235 23 15

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