इंटरनेट मानक

Disclosure to Promote the Right To Information

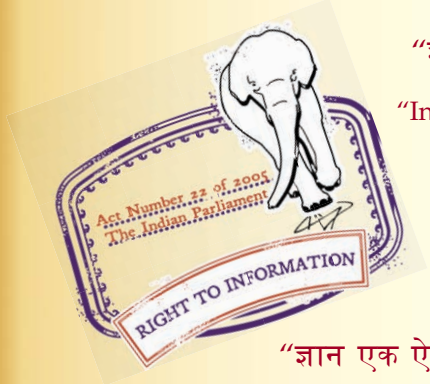
Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 2298 (1977): Specification for Single Barrel Stirrup Pump for Fire Fighting Purposes [CED 22: Fire Fighting]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"



"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

IS : 2298 - 1977
(Reaffirmed 2003)

Indian Standard

SPECIFICATION FOR SINGLE BARREL STIRRUP PUMP FOR FIRE FIGHTING PURPOSES

(Second Revision)

First Reprint JULY 1991

UDC 614.846.1

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

Gr 3 *September* 1977

Indian Standard

SPECIFICATION FOR SINGLE BARREL STIRRUP PUMP FOR FIRE FIGHTING PURPOSES

(Second Revision)

Fire Fighting Sectional Committee, BDC 22

Chairman	*Representing*
SHRI P. N. MEHROTRA	Ministry of Home Affairs
Members	
SHRI MAHESH C. AGRAWAL	Brijbasi Udyog, Mathura
SHRI P. S. BANERJEE (*Alternate*)	
DR G. N. BADAMI	Central Building Research Institute (CSIR), Roorkee
SHRI GOPAL KRISHAN (*Alternate*)	
SHRI S. R. BANSAL	Bokaro Steel Limited, Bokaro
SHRI P. K. BHARUCHA	Tariff Advisory Committee, Bombay
SHRI A. CHATTERJI (*Alternate*)	
SHRI S. C. CHATTERJEE	West Bengal Fire Services, Calcutta
SHRI D. K. BANERJEE (*Alternate*)	
SHRI H. C. RAI CHOUDHURY	Directorate General of Civil Aviation, New Delhi
SHRI K. DADARHOY	Hindustan Steel Limited, Ranchi
SHRI C. D. SHARMA (*Alternate*)	
SHRI R. R. DHORLEY	Bhabha Atomic Research Centre, Trombay, Bombay
DIRECTOR, FIRE SERVICE	Home (Police) Department, Government of Andhra Pradesh, Hyderabad
SHRI P. N. GHOSH	Ministry of Defence (R & D)
SHRI A. N. AHLUWALIA (*Alternate*)	
SHRI G. N. GIDWANI	Directorate General of Supplies & Disposals, New Delhi
SHRI H. C. VERMA (*Alternate*)	
SHRI D. P. GUPTA	Directorate General of Technical Development, New Delhi
DR D. S. JAISWAR	Avon Services (P & A) Pvt Ltd, Bombay
SHRI H. M. SABADRA (*Alternate*)	

(*Continued on page 2*)

(*Continued from page* 1)

Members	*Representing*
SHRI J. S. JAMSHEDJI	Steelage Industries Limited (Minimax Division), Calcutta
SHRI R. K. KULKARNI (*Alternate*)	
SHRI A. S. KULKARNI	Municipal Corporation of Greater Bombay (Bombay Fire Brigade), Bombay
SHRI D. K. MAJUMDAR	Allen Richards & Co, Calcutta
SHRI A. K. SARKAR (*Alternate*)	
SHRI B. R. MEHTA	Central Industrial Security Force (Ministry of Home Affairs), New Delhi
SHRI R. MEHTA	Air Foam Industries Private Ltd, New Delhi
MAJ S. K. MISRA	Ministry of Defence (DGI)
SHRI J. R. OVALEKAR	National Safety Council, Bombay
SHRI K. SRIDHAR (*Alternate*)	
SHRI I. RATHINASAMI	Home Department (Fire Service), Government of Tamil Nadu, Madras
REPRESENTATIVE	Railway Board (Ministry of Railways)
SHRI P. L. SEBASTIN	Oil & Natural Gas Commission, Dehra Dun
SHRI V. V. KIMMATKAR (*Alternate*)	
SHRI P. H. SETHNA	Kooverji Devshi & Co Pvt Ltd, Bombay
SHRI N. T. PANJWANI (*Alternate*)	
SHRI J. V. SHAH	Newage Industries, Surendranagar, Gujarat
SHRI B. J. SHAH (*Alternate*)	
SHRI VARUN SHARMA	DGL Private Limited, New Delhi
SHRI T. R. BHANOT (*Alternate*)	
SHRI D. K. SIRKAR	Synthetics & Chemicals Limited, Bareilly
SHRI R. S. SUNDARAM	Municipal Corporation of Delhi (Delhi Fire Service), Delhi
SHRI TARIT SUR	Sur Enamel & Stamping Works Private Limited, Calcutta
SHRI S. SUR (*Alternate*)	
SHRI N. P. VERGHESE	Heavy Engineering Corporation Ltd, Ranchi
SHRI B. V. WAGLE	Urban Development, Public Health and Housing Department, Government of Maharashtra, Bombay
SHRI R. R. RAO (*Alternate*)	
SHRI D. AJITHA SIMHA, Director (Civ Engg)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI K. M. MATHUR
Deputy Director (Civ Engg), ISI

Water Fittings for Fire Fighting Purposes Subcommittee, BDC 22 : 1

Convener	
SHRI P. N. MEHROTRA	Ministry of Home Affairs
Members	
SHRI S. C. CHATTERJEE	West Bengal Fire Services, Calcutta
SHRI H. C. RAI CHOUDHURY	Directorate General of Civil Aviation, New Delhi
SHRI P. N. GHOSH	Ministry of Defence (R & D)
SHRI A. N. AHLUWALIA (*Alternate*)	

(*Continued on page* 10)

Indian Standard

SPECIFICATION FOR SINGLE BARREL STIRRUP PUMP FOR FIRE FIGHTING PURPOSES

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 25 April 1977, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Stirrup pump is one of the first-aid fire fighting appliances for extinguishing fires in the initial stage. The stirrup pump is generally used for class A fires which are in ordinary combustible materials, where the quenching and cooling effect of water is necessary. It is used in conjunction with water buckets and is recommended for installation in all types of industrial and non-industrial buildings having class 'A' fire risk, in addition to other first-aid fire fighting appliances that may be necessary.

0.2.1 Strirrup pump is also used by the Civil Defence Services for dealing with small fires resulting from enemy action.

0.3 This standard was issued as an Emergency Indian Standard in March 1963 to meet the needs of the emergency and issued as firm in 1968. The second revision has been prepared based on the use of this standard in the last 8 years and to keep it in line with IS : 1971-1975*.

0.4 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†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

*Specification for hand-operated continuous single-barrel stirrup pump (*third revision*).

†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard lays down the requirements regarding material and other details of various components and performance of single barrel stirrup pump of continuous flow type used for fire fighting purposes.

2. TERMINOLOGY

2.0 For the purpose of this standard the following definitions shall apply.

2.1 Cycle — One up and one down stroke (*see* **2.6**).

2.2 Handle — A component on the plunger rod.

2.3 Plunger — A component for creating pressure or suction and pressure.

2.4 Plunger Rod — A rod or tube for helping the movement of the plunger.

2.5 Barrel — A component for guiding the movement of the plunger.

2.6 Stroke — The maximum travel of the plunger rod in one direction when the handle moves from its lowest possible position to its highest posible position.

2.7 Valve — A device provided to check or to allow the flow of liquid.

2.8 Total Mass — The mass of complete pump with all its mountings but without any liquid and discharge line, that is, without delivery hose, cut-off device, lance and nozzle.

3. MATERIALS

3.1 The materials of construction for various components of the pump conforming to relevant Indian Standards are given in Table 1.

4. COMPONENTS

4.1 Barrel — The barrel shall have a uniform bore of not less than 22 mm and the thickness of the wall shall be not less than 1·50 mm. It shall be straight throughout its entire length. The ends shall be cleanly cut and shall be square with the axis of the barrel.

4.2 Plunger Rod — The outside diameter of the plunger rod shall be not less than 16 mm after machining. It shall be straight throughout its length.

4.3 Plunger — It shall be machined all over and made a smooth working fit when inserted in the barrel at any position of either the outward or inward strokes. The plunger shall be screwed on the plunger rod.

TABLE 1 MATERIALS OF CONSTRUCTION OF VARIOUS COMPONENTS

(*Clause* 3.1)

Sl No.	Component	Material	Conforming to Indian Standard No.
(1)	(2)	(3)	(4)
1.	Barrel	Brass	IS : alloy No. 2 of IS : 407-1966[1]
2.	Plunger rod	Brass	IS : alloy No. 2 of IS : 407-1966[1]
3.	Stirrup support	Mild steel	Grade ST 32-0 of IS : 1977-1969[2]
4.	Strainer	Brass sheet	CUZN 40 of IS : 410-1973[3]
5.	Plunger	Bronze	Sand casting grade 2 of IS : 318-1962[4]
		Brass	Die casting grade 3 of IS : 292-1961[5]
			Hot forgings grade 1 of IS : 291-1964[6]
6.	Valve/housing	Brass	IS : 292-1961[5]
		Bronze	IS : 318-1962[4]
7.	Valve	Bronze	IS : 318-1962[4]
		Brass	IS : 292-1961[5]
8.	Hose	Rubber braided	IS : 913-1968[7]
9.	Gland nut	Copper alloy	IS : 318-1962[4]
		Brass	IS : 292-1961[5]
10.	Sleeve	Copper alloy	IS : 318-1962[4]
		Brass	IS : 292-1961[5]
11.	Nozzle	Copper alloy	IS : 318-1962[4]
		Brass	IS : 292-1961[5]
		Aluminium alloy	A-6-M of IS : 617-1975[8]
		High density polythylene	IS : 7328-1974[9]
12.	Handle	Timber	IS : 620-1965[10]
13.	Protective sheet	Rubber	IS : 638-1965[11]

[1]Specification for brass tubes for general purposes (*second revision*).
[2]Specification for structural steel (ordinary quality) (*first revision*).
[3]Specification for rolled brass plate, sheet, strip and foil (*second revision*).
[4]Specification for leaded tin bronze ingots and castings (*revised*).
[5]Specification for brass ingots and castings (*revised*).
[6]Specification for naval brass rods and sections (suitable for machining and forging) (*revised*).
[7]Specification for water hose of rubber with braided textile reinforcement (*second revision*).
[8]Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*revised*).
[9]Specification for high density polythylene materials for moulding and extrusions.
[10]General requirements for wooden tool handles (*second revision*).
[11]Specification for sheet rubber jointing and rubber insertion jointing (*revised*).

4.4 Strainer – The removable strainer shall be attached. The strainer shall have woven aperture size in range of 300 to 425 micron or holes of the same diameter subject to that screening area of not less than 6 times the cross-section area of the bore wall shall be provided at the intake.

4.5 Gland Nut and Sleeve — The gland nut shall be screwed to the sleeve, a spanner tight fit. The hole for the plunger rod in the gland nut shall be drilled or bored on a suitable jig to obtain the necessary alignment when the pump is assembled. The hole shall be a good sliding fit to suit the finished plunger-rod.

4.5.1 A suitable grade of greasy plaited rope packing shall be used for the gland packing. The gland packing be carefully packed to prevent leakage of water when the pump is being used.

4.6 Nozzle — The nozzle shall have a 3 mm bore and shall be of dual purpose type, the change from one operation to another being effected rapidly by the hand holding the nozzle. The jet and spray shall leave the nozzle in the same direction so that little manipulation is necessary for directing the water to the desired point (*see* **5**).

4.7 Stirrup and Its Support — The stirrup and its support shall be made of mild steel flats or rod having a convenient foot rest for easy operation. The stirrup and its support shall be properly fitted to the hose attachment The pump barrel and stirrup shall be in proper alignment to obtain the necessary balance in service (*see* Fig. 1).

4.8 Handle — The handle shall be of D-shape. It shall provide a grip of not less than 200 mm inside the grip support. The handle grip shall be of 25 mm diameter.

4.9 Hose — Water delivery hose shall have a 12·5 mm bore and shall be not less than 8 m in length.

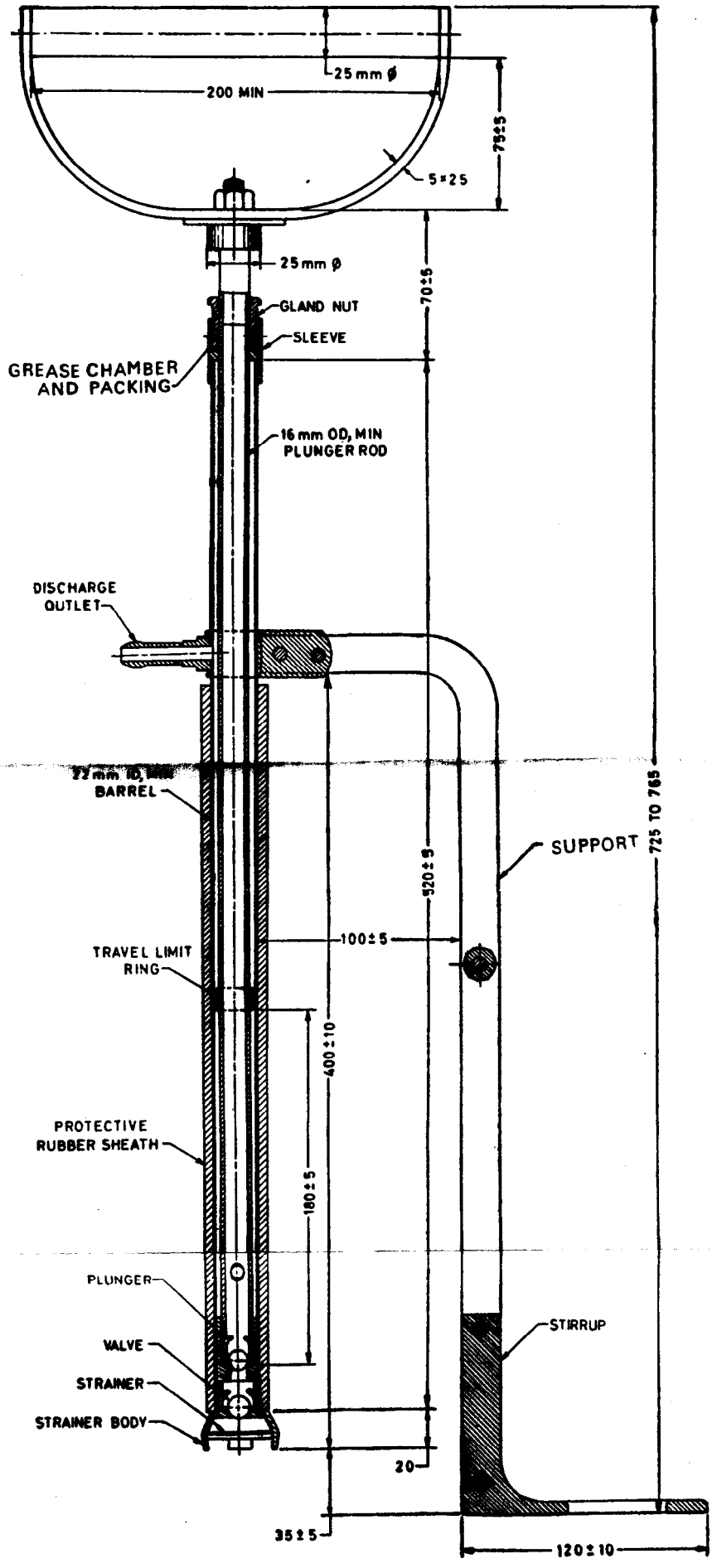
4.10 Protective Rubber Sheath — The barrel of the pump shall be protected with a rubber sheath of 5 mm thickness.

4.11 Height — The overall height of the assembled pump shall be as shown in Fig. 1.

4.12 Total Mass — The total mass shall be not more than 5 kg.

5. PERFORMANCE REQUIREMENTS

5.1 The pump shall be operated at not more than 45 c/min and the nozzle shall be held horizontally at a height of 1·5 m from the ground. In still air the plain jet of water shall hit the ground at a horizontal distance of not less than 7 m from the tip of nozzle. In addition to the plain jet of water, the pump shall be capable of producing a spray of



NOTE — The shapes of the component parts are only illustrative but the dimensions and minimum requirments, where specified, are binding.

All dimensions in millimetres.

FIG. 1 TYPICAL DESIGN OF A STIRRUP PUMP

As in the Original Standard, this Page is Intentionally Left Blank

moderate fineness (light gentle rain). The spray shall be of uniform distribution and such that, when operated with the axis of the nozzle and the maximum width of the spray approximately horizontal, its width on the ground at a distance of 3 m from the nozzle shall be not less than 60 cm and at the maximum throw not less than 90 cm.

5.2 Each pump shall satisfy the requirements as laid down in **5.1**.

6. WORKMANSHIP AND FINISH

6.1 All parts of the pump shall have good workmanship and finish.

6.2 Ferrous metal parts of the pump exposed to atmosphere shall be primer treated and painted fire red (*see* Colour No. 536 of IS : 5-1961*). The paint shall conform to IS : 2932-1964†.

7. MARKING

7.1 Each pump shall be clearly and indelibly marked with the following information:

a) Manufacturer's name or trade-mark, and

b) Year of manufacture.

7.1.1 Each pump may also be marked with the ISI Certification mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

*Colours for ready mixed paints (*second revision*).

†Specification for enamel, synthetic, exterior, Type 1, (a) undercoating; (b) finishing, colour as required.

(*Continued from page 2*)

Members	*Representing*
SHRI M. R. KAMAT	Mather & Platt Ltd, Calcutta
SHRI K. D. MULEKAR	Municipal Corporation of Greater Bombay (Bombay Fire Brigade), Bombay
SHRI A. S. KULKARNI (*Alternate*)	
MAJ S. K. MISRA	Directorate General of Inspection (Ministry of Defence)
SHRI V. K. BAJPAI (*Alternate*)	
SHRI K. RUDRAPPA	Engineers India Ltd, New Delhi
SHRI J. V. SHAH	Newage Industries, Surendranagar, Gujarat
SHRI B. J. SHAH (*Alternate*)	
SHRI R. S. SUNDARAM	Municipal Corporation of Delhi (Delhi Fire Service), Delhi

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones: 331 01 31, 331 13 75 Telegrams: Manaksanstha (Common to all Offices)

Regional Offices:	*Telephone*
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	36 24 99
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	2 18 43 3 16 41
Southern : C. I. T. Campus, MADRAS 600113	41 24 42 41 25 19 41 29 16
†Western : Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093	6 32 92 95
Branch Offices:	
'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001	2 63 48 2 63 49
‡Peenya Industrial Area 1st Stage, Bangalore Tumkur Road BANGALORE 560058	38 49 55 38 49 56
Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003	6 67 16
Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002	5 36 27
53/5, Ward No. 29, R.G. Barua Road, 5th Byelane, GUWAHATI 781003	3 31 77
5-8-56C L. N. Gupta Marg (Nampally Station Road), HYDERABAD 500001	23 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	6 34 71 6 98 32
117/418 B Sarvodaya Nagar, KANPUR 208005	21 68 76 21 82 92
Patliputra Industrial Estate, PATNA 800013	6 23 05
T.C. No. 14/1421, University P.O., Palayam TRIVANDRUM 695035	6 21 04 6 21 17
Inspection Offices (With Sale Point):	
Pushpanjali, First Floor, 205-A West High Court Road, Shankar Nagar Square, NAGPUR 440010	2 51 71
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

*Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072 — 27 68 00

†Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007 — 89 65 28

‡Sales Office in Bangalore is at Unity Building, Narasimharaja Square, Bangalore 560002 — 22 36 71

Reprography Unit, BIS, New Delhi, India