IS 14846 : 2000
(Superseding IS 780 : 1984 and IS 2906 : 1984)
REAFFIRMED 2010

भारतीय मानक

जलकल के लिए स्लूस वाल्व (50 से 1 200 मिमी साइज के) — विशिष्टि

Indian Standard

SLUICE VALVE FOR WATER WORKS PURPOSES (50 TO 1 200 mm SIZE) — SPECIFICATION

ICS 23.060.30

FOR BIS INTERNAL USE. TO BE USED FOR STANDARDS DEVELOPMENT PURPOSE ONLY

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

October 2000

Price Group 8

AMENDMENT NO. 1 JULY 2001

TO

IS 14846 : 2000 SLUICE VALVE FOR WATER WORKS PURPOSES (50 TO 1 200 mm SIZE) — SPECIFICATION

[*Page* 2, *Table* 1, *Sl No.* (i), *col* 8] — Substitute '500/7' *for* '260-300/12 or 500/2' against IS 1865 and *add* '230-450W' against IS 1030.

[*Page* 2, *Table* 1, *Sl No.* (iii), *col* 5] — Substitute the existing by '12Cr13/04Cr18Ni10/04cr17Ni12Mo2'.

(*Page* 4, *Table* 2) — Substitute the existing Table 2 with the Table 2 appearing on page 2.

(*Page* 5, *Table* 3) — Substitute the existing Table 3 with the Table 3 appearing on page 3.

(*Page* 7, *Clause* 7.7.3, *line* 1 *and* 3) — Substitute 'nut' *for* 'net'.

(*Page* 7, *Table* 3A, *Sl No.* 2, *col* 3) — Substitute '16 $^{+2.0}_{-0.0}$' *for* '165 $^{+2.0}_{-0.0}$'.

(*Page* 7, *Table* 4) — Add '*Min*' below *A, B, C* and *D*.

(*Page* 8, Fig. 4) — Substitute the existing Fig. 4 by the following:

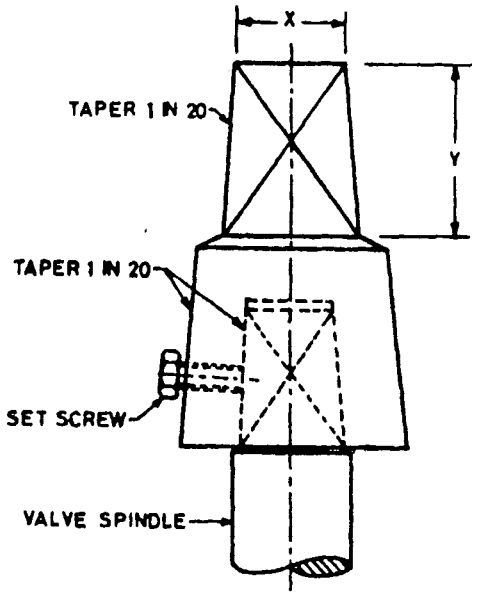

FIG 4 VALVE CAP

(*Page* 8, *clause* **7.14**) — Insert the following at the end of the clause:

' *Nominal Size of Sluice Valve* (mm)	*Size of By Pass Arrangement* (mm)
200	25

(*Page* 9, *clause* **9.1**, *lines* 3 *and* 4) — Delete '(both inside and outside)'.

Table 2 Dimensions of Sluice Valves for Nominal Pressure PN 1.0

(*Clauses* 7.2.4, 7.7.1, 7.9, 7.11, 7.12, 7.13 *and* Fig. 1A, 1B, 4 *and* 5)

All dimensions in millimetres.

Sl No.	Nominal Size	BODY			STEM										S
		Length over Flanges 'A'			Width	Overall Height	Square	Length of Square	Dia of Stem	Length from Collar		Collar Thick-ness	Dia of Collar	Depth of Nut	Inside Dia	
		PD	ALT-I	ALT-II$	B *Max*	H *Max*	a	C	d *Min*	L1	L2	t	G	K *Min*	E *Min*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
i)	50	178	250	215	160	365	15	30	22	As per manufacturer's design				30	42	
ii)	65	190	270	230	215	380	15	30	22					30	42	
iii)	80	203	280	230	220	425	15	30	22					30	42	
iv)	100	229	300	255	250	470	18	36	27					35	47	
v)	125	254	325	266	310	485	18	36	27					35	47	
vi)	150	267	350	280	330	595	18	36	27					35	47	
vii)	200	292	400	318	460	725	22	42	32					45	56	
viii)	250	330	450	355	495	835	25	48	36					50	60	
ix)	300	356	500	380	585	910	25	48	36					50	60	
x)	350	381	550	—	650	1 020	25	45	37					50	61	
xi)	400	406	600	—	750	1 110	31	54	42					55	66	
xii)	450	432	650	—	830	1 200	34	64	47					55	75	
xiii)	500	457	700	—	900	1 300	34	64	47					55	75	
xiv)	600	508	800	—	1 050	1 500	34	64	47					55	75	
xv)	700	610	900	1 130	1 150	1 670	44	78	62					65	94	
xvi)	750	610	950	1 200	1 200	1 780	48	86	67					70	99	
xvii)	800	660	1 000	1 250	1 300	1 930	48	86	67					70	99	
xviii)	900	711	1 100	1 380	1 400	2 080	53	88	77					110	113	
xix)	1 000	811	1 200	1 500	1 500	2 200	53	88	77					110	113	
xx)	1 100	$$	$$	1 650	1 650	2 450	63	99	87					115	123	
xxi)	1 200	$$	$$	1 800	1 800	2 580	63	99	87					115	123	

NOTES

1 – PD Preferred dimensions (short body).
2 – ALT I Alternate I dimensions (long body).
3 – ALT II Alternate II dimensions.
4 – $ Dimensions given under Alternate II will stand deleted with effect from 01 April 2005.
5 – ($$) As and when ISO stipulates, these dimensions will be notified.
6 – * Packing size represents diameter in case of round and side in case of square shaped packings.

Tolerances on Length 'A'

Up to and including 300 mm	± 2 mm
Above 300 and including 600 mm	± 3 mm
Above 600 and including 800 mm	± 4 mm
Above 800 and including 1 000 mm	± 5 mm
Above 1 000 mm	± 6 mm

Other Tolerances

Tolerances on square, a and X	± 0.5 mm
Tolerances on *length of square*, C	± 1.0 mm
Tolerances on size of hand wheel, D	± 5.0 mm
Tolerances on length of square 'Y'	± 0.5 mm

Table 3 Dimensions of Sluice Valves for Nominal Pressure PN 1.6

(*Clauses* 7.2.4, 7.7.1, 7.9, 7.11, 7.12, 7.13 *and* Fig. 1A, 1B, 4 *and* 5

All dimensions in millimetres.

Sl No.	Nominal Size	BODY			STEM										
		Length Over Flanges 'A'			Width	Overall Height	Square	Length of Square	Dia of Stem	Length from Collar		Collar Thickness	Dia of Collar	Depth of Nut	Inside Dia
		PD	ALT-I	ALT-II$	*B Max*	*H Max*	*a*	*C*	*Min*	*L1*	*L2*	*t*	*G*	*K Min*	*E Min*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	50	178	250	215	160	365	15	30	22					30	42
ii)	65	190	270	230	215	380	15	30	22					30	42
iii)	80	203	280	230	220	425	15	30	22					30	42
iv)	100	229	300	255	250	470	18	36	27					35	47
v)	125	254	325	266	310	485	18	36	27					35	47
vi)	150	267	350	280	330	595	18	36	27					35	47
vii)	200	292	400	318	460	725	22	42	32	As per manufacturer's design				45	56
viii)	250	330	450	355	495	835	25	48	36					50	60
ix)	300	356	500	380	585	910	25	48	36					50	60
x)	350	381	550	690	730	1 030	30	55	42					55	66
xi)	400	406	600	750	800	1 110	35	60	47					55	75
xii)	450	432	650	820	850	1 210	37	65	52					60	80
xiii)	500	457	700	880	930	1340	37	65	52					60	80
xiv)	600	508	800	1 000	1 050	1 500	42	70	57					60	89

NOTES

1 – PD Preferred dimensions (short body).

2 – ALT I Alternate I dimensions (long body).

3 – ALT II Alternate II dimensions.

4 – $ Dimensions given under Alternate II will stand deleted with effect from 01 April 2005.

5 – * Packing size represents diameter in case of round and side in case of square shaped packings.

Tolerances on Length 'A'	
Up to and including 300 mm	± 2 mm
Above 300 and including 600 mm	± 3 mm
Above 600 and including 800 mm	± 4 mm
Above 800 and including 1 000 mm	± 5 mm
Above 1 000 mm	± 6 mm

Other Tolerances	
Tolerances on square, a and X	± 0.5 mm
Tolerances on length of square, C	± 1.0 mm
Tolerances on size of hand wheel, D	± 5.0 mm
Tolerances on length of square 'Y'	± 0.5 mm

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AMENDMENT NO. 2 JUNE 2004
TO
IS 14846 : 2000 SLUICE VALVE FOR WATER WORKS PURPOSES (50 TO 1 200 mm SIZE) — SPECIFICATION

[*Page* 2, *Table* 1, *Sl No.* (iii), *col* 5 (*see also Amendment No.* 1)] — Substitute '12 Cr 12' *for* '12 Cr 13'.

(*Page* 15) — Substitute 'IS 6603 : 2001' *for* 'IS 6003 : 2000'.

(CED 3)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 3 AUGUST 2010
TO
IS 14846 : 2000 SLUICE VALVES FOR WATER WORKS PURPOSES (50 TO 1 200 mm SIZE) — SPECIFICATION

[*Page* 2, *Table* 1, *Sl No*. (v), *col* 8] — Insert '04 Cr17 Ni12 Mo2' *after* '04 Cr18 Ni10'.

[*Page* 4, *Table* 2, *col* 18 (*see also Amendment No.* 1)] — Insert '*Min*' *after* 'No. of Packing'.

[*Page* 5, *Table* 3, *col* 18 (*see also Amendment No.* 1)] — Insert '*Min*' *after* 'No. of Packing'.

(*Page* 7, *Table* 3A, *Sl No*. 4) — Insert 'holes' *after* 'bolts'.

FOR BIS INTERNAL USE. TO BE USED FOR STANDARDS DEVELOPMENT PURPOSE ONLY

(CED 3)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 4 APRIL 2012
TO
14846 : 2000 SLUICE VALVE FOR WATER WORKS PURPOSES (50 TO 1200 mm SIZE) — SPECIFICATION

(*Page* 11, *Annex* A) — Insert following new clause at the end:

'**A-1.1.16** *Back Seat Bush (For Sizes 350 mm and Above)* — Leaded tin bronze bush with rubber 'O' ring to facilitate changing of gland packing while line is in charged condition.'

(CED 3)

Reprography Unit, BIS, New Delhi, India

FOR BIS INTERNAL USE. TO BE USED FOR STANDARDS DEVELOPMENT PURPOSE ONLY

Sanitary Appliances and Water Fittings Sectional Committee, CED 3

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

IS 780 was first issued in 1956 and the first, second, third, fourth, fifth and sixth revisions were issued in 1963, 1966, 1967, 1969, 1980 and 1984, respectively. In this revision, the committee, following the practices at International level decided to merge IS 2906 in this standard.

For connections of sluice valves to a pipeline, certain situations may require the use of fittings like tail pieces and adapters. The requirement of these fittings are covered in IS 1538.

While formulating the Standard an attempt has been made of making this standard in line with other International Standards formulated on the subject. Guidance has been taken from BS, AWWA, DIN, JIS and ISO standards. At the same time the practices followed in this field in the country have been kept in view.

The information to be supplied with enquiry and order by the purchaser is given in Annex. D.

The composition of the technical committee responsible for the formulation of this standard is given at Annex F

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 or analysis 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

SLUICE VALVE FOR WATER WORKS PURPOSES (50 TO 1 200 mm SIZE) — SPECIFICATION

1 SCOPE

This standard covers requirements for non-rising stem type sluice valves from 50 to 1 200 mm sizes used for water supply up to 45°C and having double flanged ends for connections.

2 REFERENCES

The Indian Standards given in Annex E 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 in Annex E.

3 TERMINOLOGY

For the purpose of this standard, the definitions, covered in IS 4854 (Part 1) shall apply.

4 NOMINAL PRESSURES

Sluice valves shall be designated by nominal pressure (PN) defined as the maximum permissible gauge working pressure in MPa for the sizes indicated as follows:

Nominal Pressure (PN)	*Nominal Sizes*
MPa	mm
PN 1.0	50 to 1 200
PN 1.6	50 to 600

5 NOMINAL SIZES

5.1 Sluice valves shall be of the following sizes:

50, 65, 80, 100, 125, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 750, 800, 900, 1 000, 1 100 and 1 200 mm.

5.1.1 The nominal size shall refer to the nominal bore of the waterway. The actual bore at any point shall not be less than the nominal size given in **5.1**.

6 MATERIAL

The material for different component parts of sluice valves shall conform to requirements given in Table 1. Where alternative materials are specified in Table 1, these may be used with the agreement of purchaser except the combination of stem and nut for wedge (*see* 7.7).

7 MANUFACTURE

7.1 A typical illustration of a sluice valve is given in Fig. 1A, 1B and 1C.

7.2 Bodies and Bonnets

7.2.1 Bodies and bonnets shall be so designed as to withstand the test pressure specified in **10.1.1**. The bodies of the valves shall be fitted with seat rings securely fixed in machined recesses.

7.2.2 The manufacturer shall provide a reasonable clearance behind the rear face of the flange on body and bonnet to provide free access to use spanners for assembling and dismantling.

7.2.3 The portions of bonnet (gland and stuffing box) which come in contact with spindle shall be provided whenever required by the customer with bushings of minimum 3 mm thickness and of material as specified in Table 1 as a anti-frictional devices.

7.2.4 The dimensions of sluice valve assemblies are given in Tables 2 and 3 read in conjunction with Fig. 1A, 1B and 1C.

7.3 Flanges

The Flanges and their dimensions of drilling shall be in accordance with the requirements given in IS 1538 unless otherwise specified by the purchaser in the contract. The requirements for valve sizes 50 mm and 65 mm are given in Table 3A.

7.4 Wedges

7.4.1 Valves shall be fitted with double faced cast iron wedge made in one piece and having two machined facing rings securely fixed into machined recesses in the wedge. When shut, the wedge-facing ring shall ride high on the body seat ring to allow for wear. The minimum wear travel shall be 25 percent of the face width (B) of the seat ring as given in Table 4 and read in conjunction with Fig. 2A and 2B.

7.4.2 The wedge faces shall be smooth finished and shall have an equal inclination of not less than 4° up to 600 mm size and not less than 2° in sizes 700 mm and above on each side of the face of the wedge.

Table 1 Materials for Component Parts of Sluice Valve

(*Clause* 6)

Sl No.	Component	Preferred Material	Ref to IS No.	Grade or Designation	Alternative Material	Ref to IS No.	Grade or Designation
i)	Body, bonnet, dome, stool cover, wedge, stuffing box, gland, thrust plate and cap	Grey cast iron	210	FG 200	Spheroidal or Nodular iron Cast steel	1865 1030	260-300 / 12 or 500 / 2
ii)	Hand wheel	Grey cast iron	210	FG 200	Mild steel Cast steel Nodular iron	2062 1030 1865	F 410 WA 230 – 450W 400 / 12
iii)	Stem	Stainless steel	6603	12Cr 13 04Cr 18Ni 10 04Cr 17 Ni 12 MO 2	High Tensile Brass Stainless steel	320 or 6912 6603	HT 2 FHTB 2 20Cr13
iv)	Wedge nut, shoe, channel	Leaded tin bronze	318	LTB – 2	High Tensile Brass Phosphor bronze	320 6912 28	HTB 2 FHTB-2
v)	Body seat ring, wedge facing ring and bushes	Leaded tin bronze	318	LTB – 2	Alloy steel Stainless steel	3444 6603	Gr. 1 Gr. 4 Gr. 10 04Cr18Ni10
vi)	Bolts	Carbon steel	1363 (Part 1)	Class 4.6	Stainless steel	6603	
vii)	Nuts	Carbon steel	1363 (Part 3)	Class 4.0	Stainless steel	6603	
viii)	Gasket	Rubber	638	Type B	Neoprene Rubber		
ix)	Gland packing	Jute and hemp	5414		Rubber	638	Type B
x)	Gear	Spheroidal graphite iron	1865	Gr 500 / 7	Alloy steel Cast steel	1570 1030	40 Ni 2Cr1MO 28 Gr B
xi)	Gear housing	Grey cast iron	210	FG 200	Cast steel S.G. iron	1030 1865	230- 450 W 400 / 12
xii)	Pinion & pinion shaft	Wrought carbon steel	1570 (Part 3)	C55Mn75	Alloy steel Stainless steel	1570 (Part 4) 6603	40 Ni12Cr1 MO 28 04Cr18Ni10

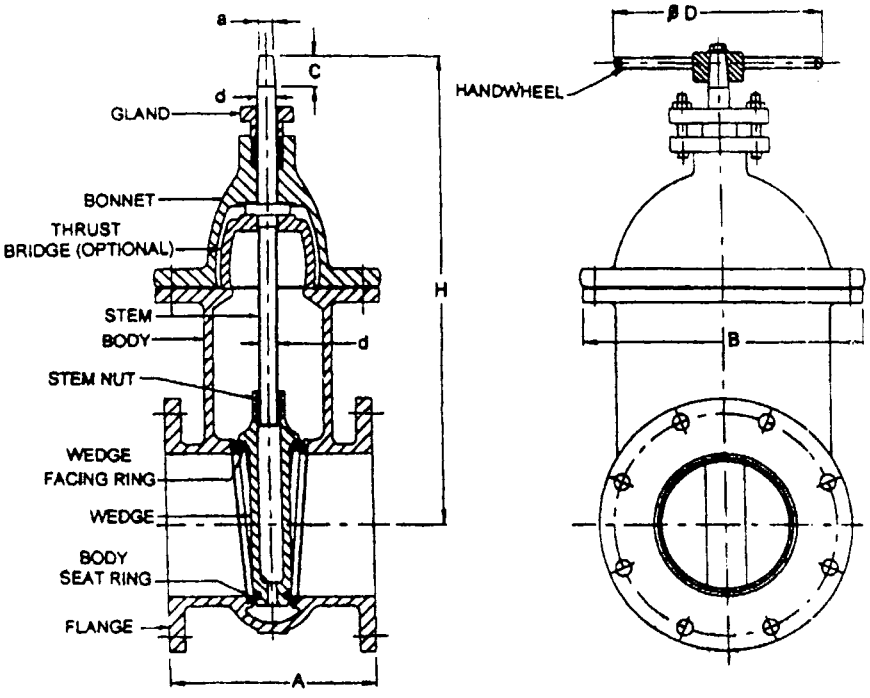


FIG. 1A TYPICAL SKETCH OF A SLUICE VALVE FOR SIZE 150 mm ϕ WITH THRUST PLATE

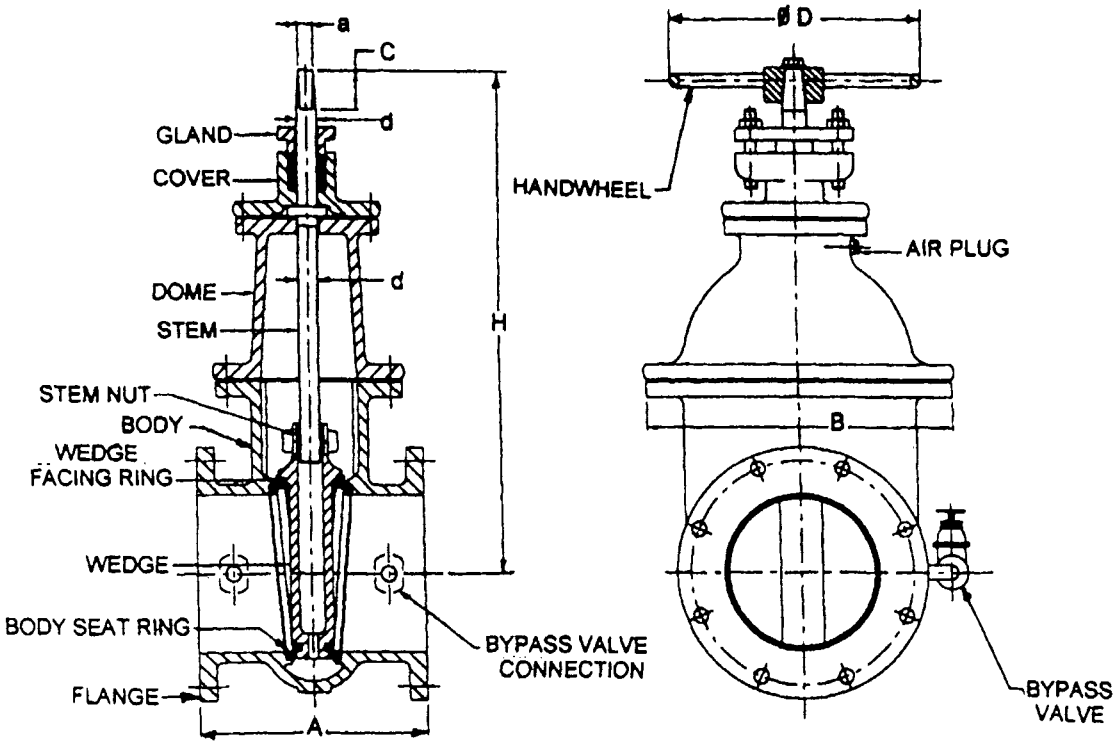


FIG. 1B TYPICAL SKETCH OF A SLUICE VALVE FOR SIZE 200 mm ϕ AND ABOVE

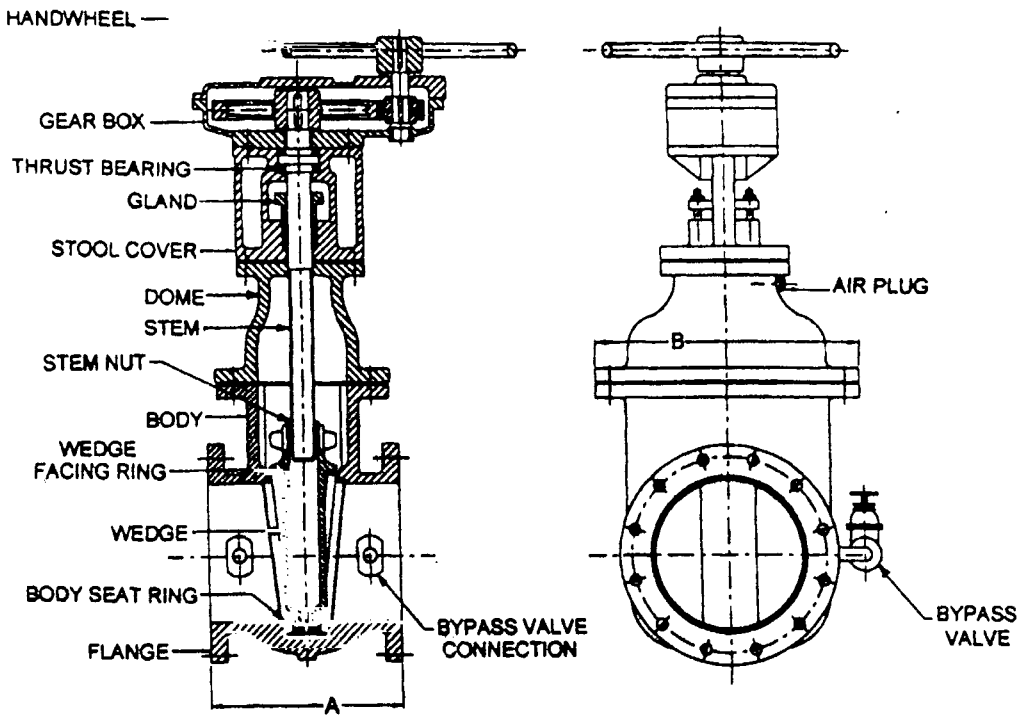


FIG. 1C TYPICAL SKETCH OF A SLUICE VALVE WITH BALL THRUST BEARING AND SPUR GEAR ARRANGEMENT

Table 2 Dimensions of Sluice Valves for Nominal Pressure PN 1.0

(*Clauses* 7.2.4, 7.7.1, 7.9, 7.11, 7.12, 7.13 *and* Fig. 1A, 1B, 4 and 5)

All dimensions in millimetres.

Sl No.	Nominal Size	BODY			STEM										S
		Length over Flanges			Width	Overall Height	Square	Length of Square,	Dia of Stem	Length from Collar		Collar Thick-ness	Dia of Collar	Depth of Nut	Inside Dia
		PD	ALT-I	ALT-II$	B *Max*	H *Max*	a	C	d *Min*	L1	L2	t	G	K *Min*	E
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	50	178	250	215	160	365	15	30	22	225	180	8	50	30	42
ii)	65	190	270	230	215	380	15	30	22	225	180	8	50	30	42
iii)	80	203	280	230	220	425	15	30	22	240	190	8	50	30	42
iv)	100	229	300	255	250	470	18	36	27	240	190	8	55	35	47
v)	125	254	325	266	310	485	18	36	27	250	200	10	55	35	47
vi)	150	267	350	280	330	595	18	36	27	250	200	10	55	35	47
vii)	200	292	400	318	460	725	22	42	32	340	280	10	65	45	56
viii)	250	330	450	355	495	835	25	48	36	450	270	15	65	50	60
ix)	300	356	500	380	585	910	25	48	36	465	240	15	70	50	60
x)	350	381	550	—	650	1 020 0	25	45	37	As per manufacturer's design				50	61
xi)	400	406	600	—	750	1 110 0	31	54	42					55	66
xii)	450	432	650	—	830	1 200 0	34	64	47					55	75
xiii)	500	457	700	—	900	1 300 0	34	64	47					55	75
xiv)	600	508	800	—	1 050 0	1 500 0	34	64	47					55	75
xv)	700	610	900	1 130 0	1 150 0	1 670 0	44	78	62					65	94
xvi)	750	610	950	1 200 0	1 200 0	1 780 0	48	86	67					70	99
xvii)	800	660	1 000 0	1 250 0	1 300 0	1 930 0	48	86	67					70	99
xviii)	900	711	1 100 0	1 380 0	1 400 0	2 080 0	53	88	77					110	113
xix)	1 000 0	811	1 200 0	1 500 0	1 500 0	2 200 0	53	88	77					110	113
xx)	1 100 0	$$	$$	1 650 0	1 650 0	2 450 0	63	99	87					115	123
xxi)	1 200 0	$$	$$	1 800 0	1 800 0	2 580 0	63	99	87					115	123

NOTES

1 – PD Preferred dimensions (short body).

2 – ALT I Alternate I dimensions (long body).

3 – ALT II Alternate II dimensions.

4 – $ Dimensions given under Alternate II **will stand deleted with effect from 01 April 2005.**

5 – ($$) As and when ISO stipulates, these dimensions will be notified.

Tolerances on Length L

Up to and including 300 mm	± 2 mm
Above 300 and including 600 mm	± 3 mm
Above 600 and including 800 mm	± 4 mm
Above 800 and including 1 000 mm	± 5 mm
Above 1 000 mm	± 6 mm

Other Tolerances

Tolerances on Square, a and X	± 0.5 mm
Tolerances on Length of Square, C	± 1.0 mm
Tolerances on Size of Hand Wheel, D	± 5.0 mm
Tolerances on Length between Square	± 0.5 mm

Table 3 Dimensions of Sluice Valves for Nominal Pressure PN 1.

(*Clause* 7.2.4, 7.7.1, 7.9, 7.11, 7.12, 7.13 *and* Fig. 1A, 1B, 4 and 5

All dimensions in millimetres.

Sl No.	Nominal Size	BODY			STEM										
		Length Over Flanges			Width	Overall Height	Square	Length of Square	Dia of Stem	Length from Collar		Collar Thickness	Dia of Collar	Depth of Nut	Inside Dia
		PD	ALT-I	ALT-II$	B *Max*	H *Max*	a	C	d *Min*	L1	L2	t	G	K *Min*	E
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	050	178	250	215	160	365	15	30	22	225	180	08	50	30	42
ii)	065	190	270	230	215	380	15	30	22	225	180	08	50	30	42
iii)	080	203	280	230	220	425	15	30	22	240	190	08	50	30	42
iv)	100	229	300	255	250	470	18	36	27	240	190	08	55	35	47
v)	125	254	325	266	310	485	18	36	27	250	200	10	55	35	47
vi)	150	267	350	280	330	595	18	36	27	250	200	10	55	35	47
vii)	200	292	400	318	460	725	22	42	32	340	280	10	65	45	56
viii)	250	330	450	355	495	835	25	48	36	450	280	10	65	50	60
ix)	300	356	500	380	585	910	25	48	36	465	240	15	70	50	60
x)	350	381	550	690	730	1 030 0	30	55	42	As per manufacturer's design				55	66
xi)	400	406	600	750	800	1 110 0	35	60	47					55	75
xii)	450	432	650	820	850	1 210 0	37	65	52					60	80
xiii)	500	457	700	880	930	1340 0	37	65	52					60	80
xiv)	600	508	800	1 000 0	1 050 0	1 500 0	42	70	57					60	89

NOTES

1 – PD Preferred dimensions (short body).

2 – ALT I Alternate I dimensions (long body).

3 – ALT II Alternate II dimensions.

4 – $ Dimensions given under Alternate II **will stand deleted with effect from 01 April 2005.**

Tolerances on Length L		**Other Tolerances**	
Up to and including 300 mm	± 2 mm	Tolerances on Square, a and X	± 0.5 mm
Above 300 and including 600 mm	± 3 mm	Tolerances on Length of Square, C	± 1.0 mm
		Tolerances on Size of Hand wheel, D	± 5.0 mm
		Tolerances on Length between Square	± 0.5 mm

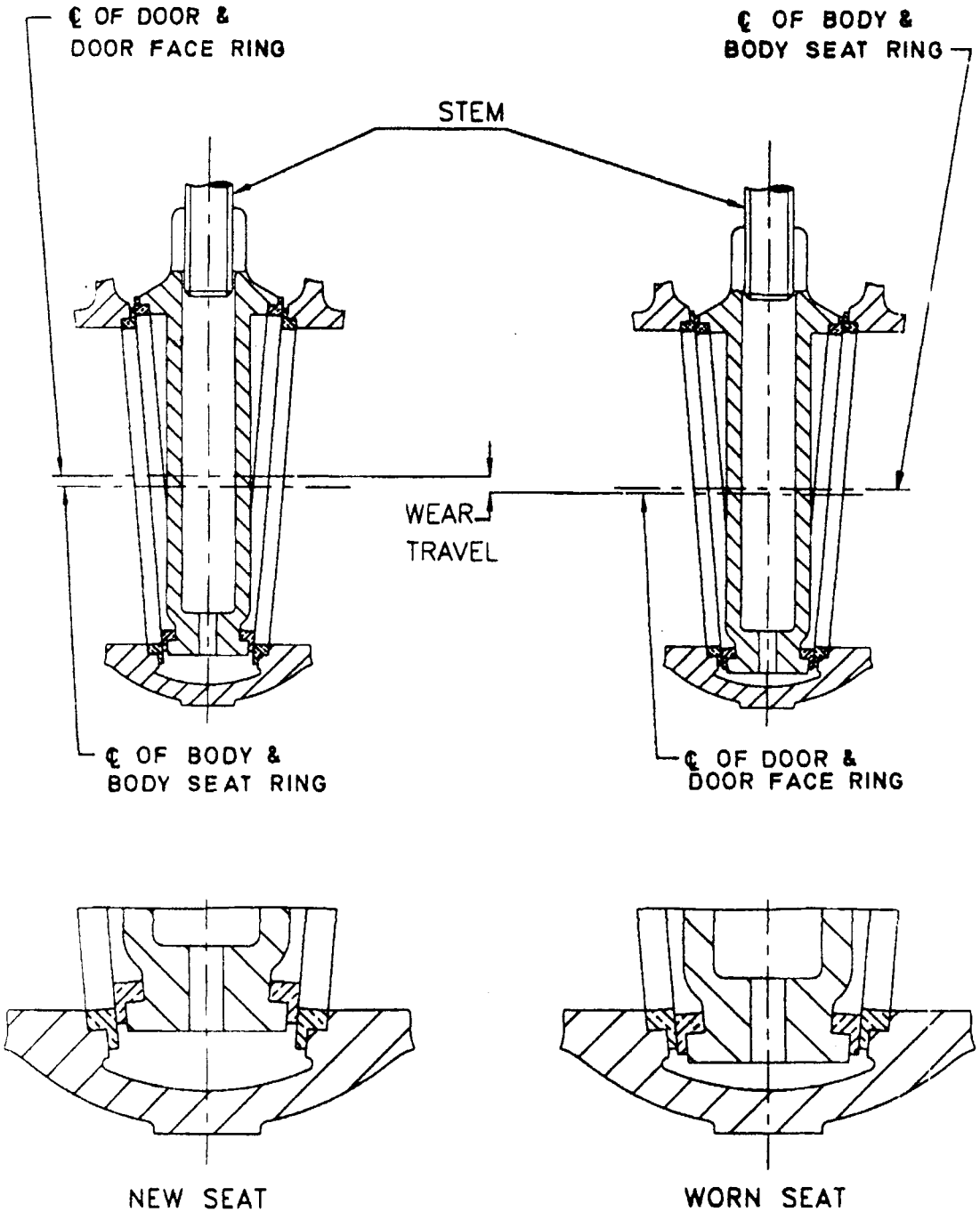


FIG. 2A TYPICAL SKETCH OF WEAR TRAVEL OF WEDGE

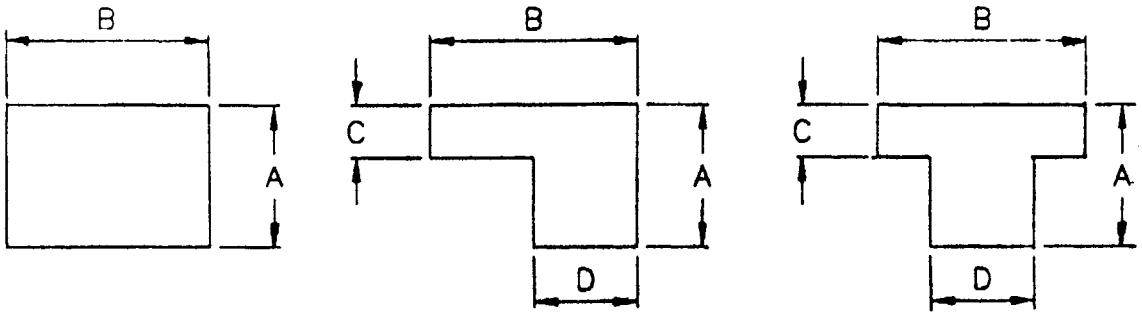
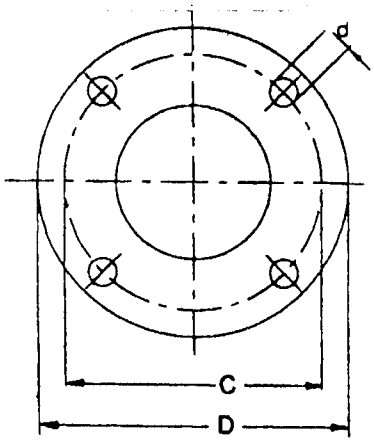


FIG. 2B DIMENSIONS BODY SEAT AND WEDGE FACING RINGS

Table 3A Flanges of Sluice Valves

(*Clause* 7.3)

All dimensions in millimetres.



Sl No.	Particulars	Dimensions for Nominal Size			
		50		65	
1.	Outside diameter (D)	165	+1.5 −1.0	185	+1.5 −1.0
2.	Thickness of flange	165	+2.0 −0.0	16	+2.0 −0.0
3.	Diameter of bolt circle (C)	125±1.0		145±1.0	
4.	Number of bolts (Equally spaced off centre)	4		4	
5.	Diameter of bolt holes (d)	19		19	
6.	Diameter of bolts	16		16	

Table 4 Dimensions of Body, Seat and Wedge Facing Rings

(*Clause* 7.4)

All dimensions in millimetres.

Valve Size	*A*	*B*	*C*	*D*
50	7	10	3	5
65	8	11	3	6
80	8	12	3	6
100	9	13	3	7
125	9	14	4	7
150	9	14	4	7
200	11	16	4	8
250	11	17	4	9
300	13	19	5	10
350	13	19	5	10
400	13	19	5	10
450	13	19	5	10
500	15	22	6	11
600	16	24	6	12
700	19	28	7	14
750	19	28	7	14
800	22	32	8	16
900	24	36	9	18
1 000	27	40	10	20
1 100	30	44	11	22
1 200	30	44	11	22

7.5 Guides and Lugs

The guides and the lugs shall be provided to guide the wedge through its full travel. It shall be optional for the manufacturer to provide guides on the wedge and lugs on the body or *vice-versa*. Where sluice valves are intended to be used in a horizontal position and where so desired by the purchaser the lugs and guides shall be provided with channel and shoe arrangement as per material specification in Table 1. Wherever the channel and shoe arrangement is provided on guides and lugs, the same shall be secured by non-protruding rigid rivets of non-ferrous metals. The thickness of the channel and shoe liner shall be minimum 5 mm for sizes of valves 450 mm and above. The maximum clearance between the guides and lugs with or without channel and shoe arrangement shall be as given in **7.5.1**.

7.5.1 The clearance between lugs and guides for different sizes of sluice valves shall be as given below:

Valve Size (mm)	*Maximum Total Clearance* (mm)
50 to 300	3
350 to 450	4
500 to 600	5
700 to 1 200	6

7.6 Facing or Seat Rings

The dimensions of the wedge facing rings and body seat rings shall be as specified in Table 4 read in conjunction with Fig. 2B.

7.7 Stems and Wedge Nuts

7.7.1 The major dimensions of stems and wedge nuts shall be in accordance with Tables 2, 3 and 4 and read in conjunction with Fig.1A, 1B, 1C, 2A, 2B, 3A, 3B, 4, 5 and 6.

7.7.2 Stems shall have machine-cut single start square or trapezoidal threads of such lengths that the wedges can be raised to a position so as to ensure full flow passage through the valve.

7.7.3 The clearance between the wedge net housing lugs on the wedge and the inside surface of the valve body shall be adequate to insert the wedge net into the wedge lug recess either in the direction of water flow or in perpendicular direction when the wedge is in closed position.

7.7.4 The stem of all valves shall be so screwed as to close the valve when the cap, hand wheel or crank handle is rotated in clockwise direction (However, counter clockwise rotation of stem for valve closure is permitted subject to agreement between the purchaser and the manufacturer). Stems required for hand wheel mounting shall be tapped on top to suit setscrew.

7.8 Bolts and Nuts

Bolts and nuts shall conform to IS 1363 and IS 4218 (Part 5). Tee headed bolts may also be used where necessary.

7.9 Height of Valve

The heights of valves shall conform to those given in Tables 2 and 3 read in conjunction with Fig 1A, 1B and 1C.

7.10 Gears

Gears if provided, shall be of suitable design (*see* IS 2535) and workmanship, so as to ensure satisfactory working of sluice valve. Gear ratio shall be worked out keeping in view the maximum stem torque, hand wheel diameter and hand wheel effort as specified in 7.11. The material for different components of gear shall conform to the requirements given in Table 1.

7.11 Hand Wheel

Hand wheel material shall be as per Table 1 and shall have on the upper side of the rim the words OPEN and SHUT with direction arrows as shown in Fig. 3A and 3B. The hand wheel shall be secured by a set-screw. A steel washer to cover the square hole in the boss shall be fixed between the head of the setscrew and the boss of the hand wheel. The rim of the hand wheel may be smooth or serrated and the spokes may be curved or straight. The size of hand wheel for each size of valve shall be as specified in Tables 2 and 3. The total hand wheel effort shall not exceed 80 N at the periphery of the hand wheel on opening/closing of valve.

7.12 Valve Caps

The stem of sluice valve operated by a removable key shall be provided with caps of dimensions as given in Tables 2 and 3 (*see* Fig. 4) and shall be secured by setscrew.

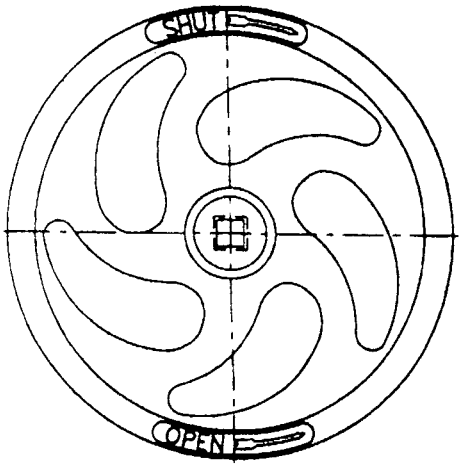


FIG. 3A CAST HANDWHEEL

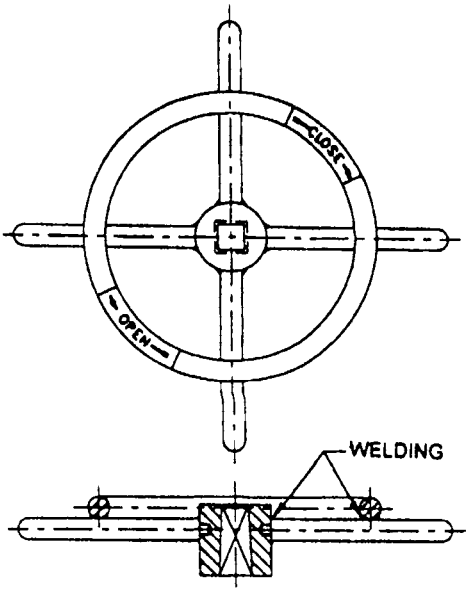


FIG. 3B FABRICATED HANDWHEEL

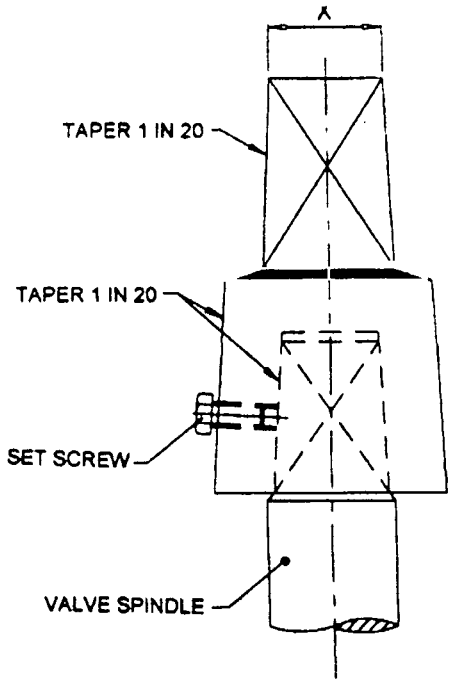


FIG. 4 VALVE CAP

7.13 Stuffing Box

The minimum inside dimensions of stuffing box shall be in accordance with Tables 2 and 3 read in conjunction with Fig. 5.

7.14 By Pass Arrangements

Sluice valves may be provided with by pass arrangements, if required by the purchaser. The

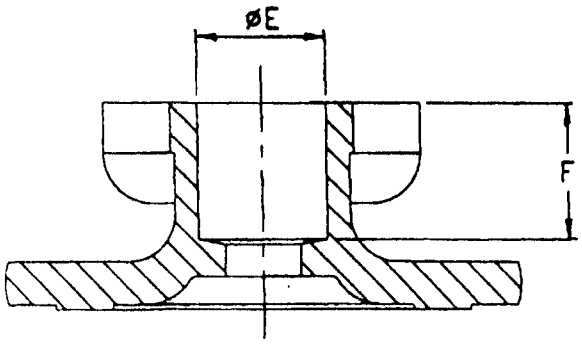


FIG. 5 STUFFING BOX

minimum size of by pass arrangements as required by a purchaser shall be as given below:

Nominal size of Sluice Valve (mm)	*Size of By Pass Arrangement* (mm)
250	25
300	25
350	40
400	40
450	50
500	50
600	65
700	80
750	80
800	80
900	100
1 000	100
1 100	125
1 200	125

8 ACCESSORIES OR OPTIONAL FEATURES

Some of the accessories or optional features used with large sluice valves are given in Annex A for information.

9 COATING

9.1 All coatings shall be carried out after satisfactory testing of the valves prior to despatch. All the unmachined ferrous surfaces of the valve (both inside and outside) shall be thoroughly clean, dry and shall be free from rust and grease before painting. All exposed machined ferrous surfaces shall be painted with one coat of aluminium red oxide primer conforming to IS 5660.

9.2 Two coats of black japan conforming to Type B of IS 341 or paint conforming to IS 9862 or IS 2932 shall be applied by brush or spray for exterior application in colour as approved by the purchaser.

NOTE — A valve may be assembled without coating if a purchaser specifically desires to inspect the assembled valve without any coating.

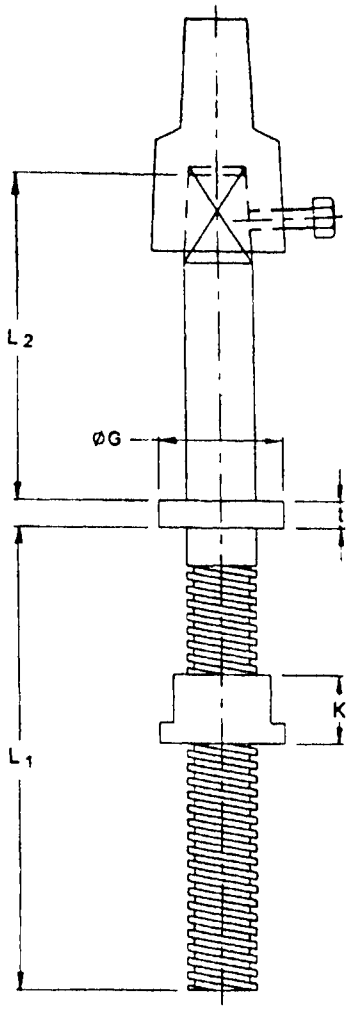


FIG. 6 STEM WITH CAP

10 TESTING

10.1 Hydrostatic Test

10.1.1 Each valve shall be subjected to hydrostatic tests as described in Annex B to the test pressures and test duration specified in Table 5 and Table 6 respectively. The valves during the test shall not show any sign of leakage.

Table 5 Test Pressure for Sluice Valves

PN Rating	Test for Body/Seat	Test Pressure MPa (Gauge)
PN 1.0	Body	1.5
	Seat	1.0
PN 1.6	Body	2.4
	Seat	1.6

10.1.2 Valves intended, when in use, to be rigidly held at both ends in a pipeline either above or below ground, shall be subjected to 'closed-end' test (*see* **B-1**).

Table 6 Test Duration for Sluice Valves

(*Clause* 10.1.1)

Valve Size mm	Test for Body/Seat	Test Duration min
50 to 1 200	Body	5
	Seat	2

10.1.3 Valves intended, when in use, to be in a terminal position rigidly held at one end only, shall be subjected to 'open-end' test (*see* **B-2**).

10.2 Test for Stem

10.2.1 *Flaw Detection Test for Stems*

All stems, whether integrally forged or formed by an established technique shall be subjected to tests laid down in **10.2.1.1** in accordance with sampling procedure outlined in Annex C. For 700 to 1 200 mm valves every stem shall be subjected to tests specified in **10.2.1.1**.

10.2.1.1 *Liquid penetrant test*

After forming of a collar no stem shall show any sign of flaw when subjected to liquid penetrant flaw detection test in accordance with IS 3658.

11 MARKING

11.1 The following information shall be cast on each valve body in raised letters.

a) The manufacturer's name or trade-mark;
b) The nominal pressure of valve (PN 1.0 or PN 1.6);
c) Size of valve (mm);
d) Heat number of cast;
e) Year of manufacture;

In addition each valve shall bear conspicuously upon it prior to despatch;

f) Serial number in punch, on top of flanges; and
g) Where a valve has been tested for only open-end test, it should be marked 'O' distinctly and permanently on flanges adjacent to serial number.

11.2 Each sluice valve may also be marked with the Standard Mark.

11.2.1 The use of Standard Mark is governed by the provision of the *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

12 INFORMATION TO BE SUPPLIED WITH ENQUIRY OR ORDER

The purchaser shall supply the information given at Annex D along with his enquiry or order.

13 PACKING AND STORAGE

A recommended procedure for packing and storage is given below:

a) *Packing* — All valves shall be supplied with the wedge closed. Bright parts shall be protected against rust. Valves of small diameter may be packed in wooden cases and be suitably protected against damage. Parts liable to injury in transit shall be wrapped with wood-wool or similar material as a protection. Hand wheels of valves forwarded loose shall be removed before despatch.
b) *Storage* — Valves shall be stored in roofed stores away from dirt.

ANNEX A

(*Clause* 8)

ACCESSORIES OR OPTIONAL FEATURES FOR SLUICE VALVES

A-1 ACCESSORIES OR OPTIONAL FEATURES

A-1.1 Accessories used, where required, with large sluice valves are given in **A-1.1.1** to **A-1.1.15** and details of these should be furnished by the manufacturer where so desired by the purchaser.

A-1.1.1 *Locking Arrangement for Hand Wheel*

A-1.1.2 *Valve Gate Position Indicator*

They shall have two positions marked at the shut end of the scale, first one corresponding to the position of the gate tangential to the bore of the seating and the second position below the first, corresponding to the position of the gate as it sits on the seating after moving a further distance equal to the depth of the seating.

A-1.1.3 *Anti-Friction Devices*

Thrust bearing of ball or similar type for stem collars.

A-1.1.4 *Valve Headstock for Manual Operation*

Through extended Stem with a view to facilitate operation or when operation point is exactly over the extended Stem.

A-1.1.5 Gunmetal scour or cast iron cleaning door at the bottom of the sluice valve body.

A-1.1.6 *By-Pass Arrangement Valve*

Full way gate valve may conform to IS 778 and sluice valve where used, may conform to this standard.

A-1.1.7 *Power Drive*

Hydraulic, pneumatic or electric

A-1.1.8 *Easing Screw*

A-1.1.9 *Air*

Release plug

A-1.1.10 *Drain Plug*

A-1.1.11 *Channel and Shoe Arrangement*

A-1.1.12 *Gearing Arrangement*

Spur, worm or bevel

A-1.1.13 *Chain and Wheel Arrangement*

A-1.1.14 *Riveted Seat Rings in the Body*

A-1.1.15 Pipe flanges drilling and dimensions other than IS 1538.

ANNEX B

(*Clause* 10.1.1)

TESTING OF SLUICE VALVES

B-1 CLOSED-END TEST

B-1.1 Each valve shall be tested with the spindle in vertical position, unless otherwise specified by the purchaser. The testing machine, which may be either of hydraulic or mechanical type, shall exert adequate force to compress the flexible material on either side without exerting an undue load on the valve body.

B-1.2 Each valve held in vertical position shall be subjected to three hydrostatic tests. The first test shall be made with the wedge open and the pressure applied for a period of minimum 5 minutes to the whole body of the valve after releasing air through the gland. The second and third tests shall be made to determine the water tightness of the faces with the wedge closed. After the first test, the body pressure shall be reduced to working pressure and the wedge shall be closed so that the bonnet remains filled with water. The second test shall be conducted with the pressure (*see* **10.1.1**) applied to the one face and the third test with the pressure applied to the other face of the wedge. Under this condition, the valve seating on the down-stream side shall be watertight for a period of 2 minutes. During the period of above test, the pressure gauge reading shall not fall below the test pressure.

B-1.3 A typical arrangement for closed-end test for sluice valves is shown in Fig. 7. The first test is done with the wedge open and the pressure applied to the whole body of the valve. The second test is made as shown by applying pressure from side *Y* hydraulically, the third test is done applying pressure from the side *X*.

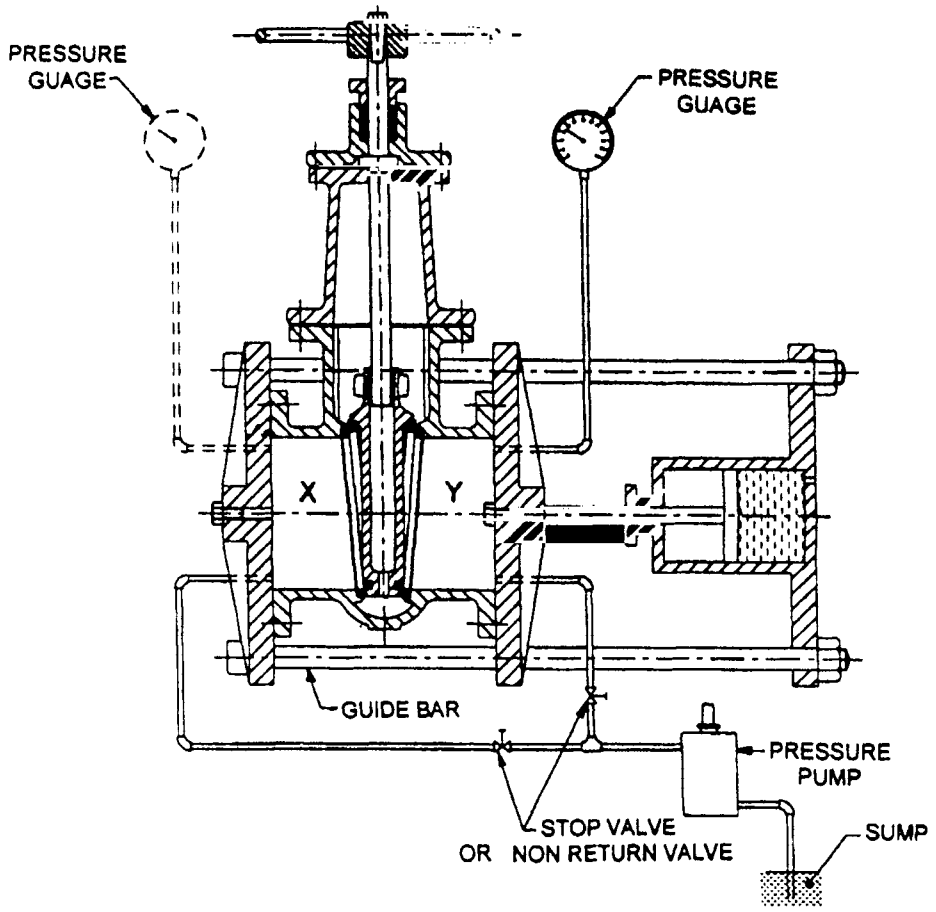


FIG. 7 TYPICAL VALVE TESTING ARRANGEMENT FOR CLOSED-END TEST

B-2 OPEN-END TEST

B-2.1 Each valve held in vertical position shall be subjected to three separate hydrostatic tests. The first test shall be made when the wedge is open and the pressure applied to whole body of the valve after releasing air through the gland and for this test only use of the testing machine for closed end testing shall be permissible. The second and third tests shall be made to determine the water-tightness of the faces with the wedge closed and the valve fixed at one end only. After the test, the wedge shall be closed so that the bonnet remains filled with water. The second test shall be conducted with the pressure (*see* **10.1.1**) applied to the one face and the third test with the pressure applied to the other face of the wedge. Under this condition, the valve seating on the down-stream side shall be watertight for a period of 2 minutes. During the period of above test, the pressure gauge reading shall not fall below the test pressure.

B-2.2 A typical arrangement for open-end of sluice valve is shown in Fig. 8. The first test is conducted when the gate is open as in the case of closed-end test, the second test is conducted by applying the pressure from the side *Y*, the third is performed by reversing valve and applying pressure from the side *X*.

NOTE — Any valve that has been tested only by the closed-end tests and which, during the testing of a main or part of main after laying, occupies a terminal position on the main, should have its exposed end blanked off and its wedge in the open position. Any valve that has been tested by the open-end tests should be similarly treated if the test pressure applied to the main exceeds the maximum working pressure. In either case any precaution necessary to resist hydraulic thrust on the valves by strutting or otherwise should be taken.

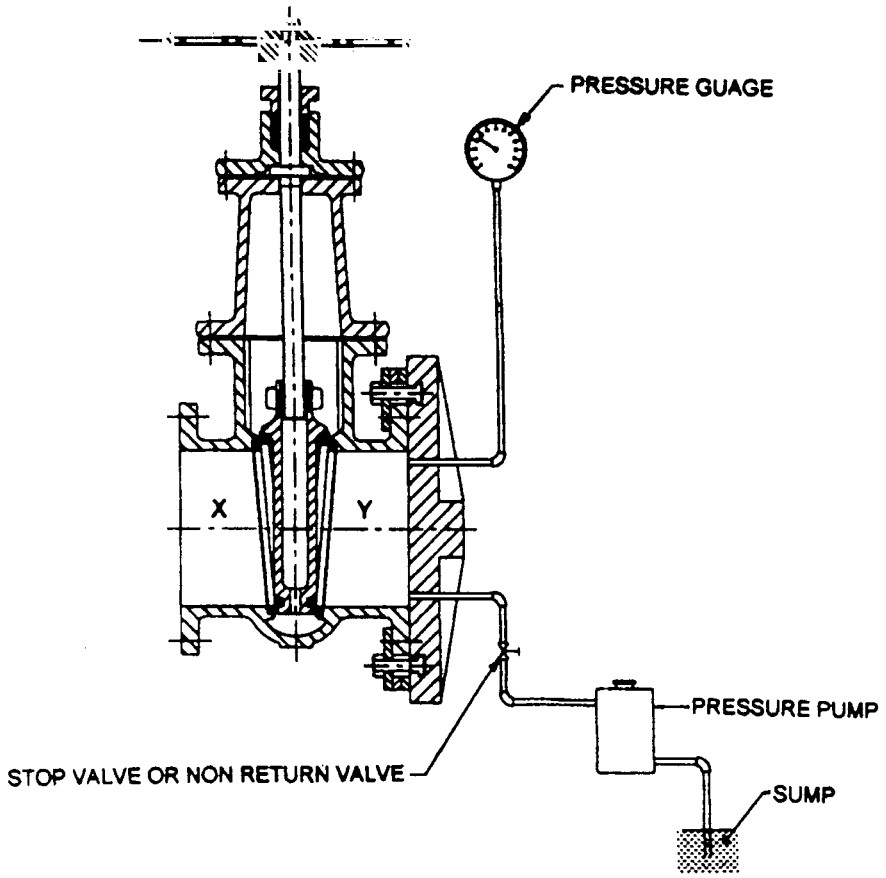


FIG. 8 TYPICAL VALVE TESTING ARRANGEMENT FOR OPEN-END TEST

ANNEX C

(*Clause* 10.2.1)

SAMPLING OF FORGED STEMS FOR FLAW DETECTION TEST

C-1 LOT

C-1.1 All the forged stems of same size from the same manufacturer, produced from the same batch of brass or stainless steel, shall be grouped together to constitute a lot.

C-1.2 Each lot as defined in **C-1.1**, shall be taken separately for sampling and testing before it is accepted for utilization in producing of valves. For this purpose, the number of samples depending on the size of the lot shall be drawn from the lot strictly at random. The number of samples from a lot shall be as given in **C-2**. For ensuring the randomness of sampling, guidance may be taken from IS 4905.

C-2 SCALE OF SAMPLING

The number of sample stems to be selected from a lot shall be as given below:

No. of Stems in the Lot	*No. of Stems in the Sample*
Up to 8	All
9 to 25	8
26 to 50	13
51 to 100	20
101 to 300	32
301 and over	50

C-3 CRITERIA FOR CONFORMITY

C-3.1 All the sample stems selected from the lot in accordance with **C-1.2**, shall be subjected to the flaw detection test. The lot shall be accepted only when all the sample stems are found to pass in the flaw detection test.

C-3.2 In case, if any one or more of the sample stems failing in the flaw detection test, all the stems in the lot shall be subjected to flaw detection test before acceptance and only those which are found to be satisfactory, shall be used in the production of valves.

ANNEX D

(*Clause* 12)

INFORMATION TO BE SUPPLIED WITH THE ENQUIRY AND ORDER

D-1 The following information shall be supplied by the purchaser along with the enquiry and order:

a) Nominal pressure of valve required;
b) Size of valve required;
c) Whether hand wheel or cap is required;
d) Whether hand wheels are required with special finish;
e) Whether the water is specially corrosive, and if so details to be given;
f) Whether valves are for use in pipeline or in unsupported or terminal positions;
g) Tests required (whether 'closed-end' or 'open-end');
h) Whether additional test, other than those specified are required;
j) Whether contrary to the specification, counter clockwise rotation for closing is required;
k) Nature of operation — Vertical, horizontal or inclined;
m) Flanges / Flange dimensions specific, if any;
n) Whether tail pieces or adaptors are required to suit special types or for proprietary or other joints;
p) Type of power operation required, if any;
q) Type of gear required;
r) Thrust bearings, if required on stem collar; and
s) By pass arrangement, if required.

ANNEX E

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
28 : 1985	Phosphor bronze ingots and castings (*fourth revision*)
210 : 1993	Grey iron castings (*fourth revision*)
318 : 1981	Leaded tin bronze ingots and castings (*second revision*)
320 : 1980	High tensile brass rods and sections (other than forging stock) (*second revision*)
341 : 1973	Black japan, Type A, B and C (*first revision*)
638 : 1979	Sheet rubber jointing and rubber insertion jointing (*second revision*)
778 : 1984	Copper alloy gate, globe and check valves for water works purposes (*fourth revision*)
1030 : 1989	Carbon steel castings for general engineering purposes (*fourth revision*)
1363 (Part 1) : 1992	Hexagon head bolts, screws and nuts of product grade C : Part 1 Hexagon head bolts (*third revision*)
1363 (Part 3) : 1992	Hexagon head bolts, screws and nuts of product grade C : Part 3 Hexagon nuts (size range M5 to M64) (*third revision*)
1538 : 1993	Cast iron fittings for pressure pipes for water gas and sewage (*third revision*)
1570 (Part 3) : 1979	Schedules for wrought steels: Part 3 Carbon and carbon manganese free cutting steels (*first revision*)
1865 : 1991	Iron castings with spheroidal or nodular graphite (*third revision*)
2062 : 1992	Steel for general structural purposes (*fourth revision*)
2535 : 1978	Basic rack and modules of cylindrical gears for general engineering and heavy engineering (*second revision*)
2712 : 1979	Compressed asbestos fibre jointing (*second revision*)
2932 : 1993	Enamel, synthetic, exterior (a) undercoating (b) finishing (*second revision*)

IS No.	*Title*
3444 : 1987	Corrosion resistant alloy steel and nickel base castings for general application (*second revision*)
3658 : 1981	Code of practice for liquid penetrant flaw detection (*first revision*)
4218 (Part 5) : 1979	ISO Metric screw threads: Part 5 Tolerances (*first revision*)
4687 : 1995	Gasket and packing — Gland packing asbestos (*second revision*)
4854 (Part 1) : 1969	Glossary of terms for valves and their parts : Part 1 Screw down stop check and gate valve and their parts
4905 : 1968	Methods for random sampling
5414 : 1995	Gasket and packing — Gland packing, jute and hemp (*first revision*)
5660 : 1970	Ready mixed paint, brushing, aluminium — Red oxide primer
6603 : 2000	Stainless steels bars and flats (*first revision*)
6912 : 1985	Copper and copper alloy forging stock and forgings (*first revision*)
7008 (Part 3) : 1988	ISO Metric trapezoidal screw threads : Part 3 Basic dimensions (*first revision*)
7008 (Part 4) : 1988	ISO Metric trapezoidal screw threads : Part 4 Tolerances (*first revision*)
9862 : 1981	Ready mixed paint, brushing, bituminous, black, lead-free, acid, alkali, water and chlorine resisting

ANNEX F

(Foreword)

COMMITTEE COMPOSITION

Sanitary Appliances and Water Fittings Sectional Committee, CED 3

Chairman	*Representing*
SHRI S. K. CHHABRA	Delhi Jal Board, New Delhi
Members	
SHRI VIDUR BHASKAR	Bhaskar Refractories & Stoneware Pipes Pvt Ltd, Faridabad
HYDRAULIC ENGINEER	Brihanmumbai Municipal Corporation, Mumbai
DEPUTY HYDRAULIC ENGINEER (*Alternate*)	
SHRI D. P. SINGH	Building Materials and Technology Promotion Council, New Delhi
SHRI V. K. SETHI (FIELD OFFICER) (*Alternate*)	
SHRI M. P. JAIPURIA	Capstan Meters (India) Ltd, Jaipur
SHRI S. A. KHAN (*Alternate*)	
ADVISOR (PH ENGG)	Central Public Health and Environmental Engineer's Organization, New Delhi
DY ADVISOR (PH ENGG) (*Alternate*)	
SHRI SURESH KUMAR SHARMA	Central Building Research Institute, Roorkee
SHRI AJAY SINGH (*Alternate*)	
DR A. K. GUPTA	Central Glass & Ceramic Research Institute (CSIR), Calcutta
DR S. K. NAYAK	Central Institute of Plastic Engineering and Technology, Chennai
DR S. C. SHIT (*Alternate*)	
ADVISOR (P. H. ENGG)	Central Public Health and Environmental Engineer's Organization, New Delhi
DY ADVISOR (P. H. ENGG) (*Alternate*)	
SSW (NDZ -1)	Central Public Works Department, New Delhi
SOW (NDZ-1) (*Alternate*)	
CHIEF ENGINEER	Delhi Development Authority, New Delhi
SHRI M. GANGARAJU	Directorate General of Supplies and Disposals, New Delhi
SHRI R. P. SINGH (*Alternate*)	
SHRI L. N. KAPOOR	Delhi Jal Board, New Delhi
SHRI G. RABINDRANATH RAO	EID-Parry (India) Ltd, Ranipet
SHRI S. SIVAKUMAR (*Alternate*)	
SHRI L. D. SHARMA	Engineer-in-Chief's Branch, New Delhi
SHRI S. K. KAILA (*Alternate*)	
SHRI J. R. AGGARWAL	Goverdhan Das PA (Calcutta), Calcutta
SHRI SANJAY AGGARWAL (*Alternate*)	
SHRI R. K. SOMANY	Hindustan Sanitaryware Industries Ltd, Bahadurgarh
SHRI SANDIP SOMANY (*Alternate*)	
SHRI K. LAKSHMI NARAMANA	Hindustan Shipyard Ltd, Visakapatnam
SHRI A. SHARIFF (*Alternate*)	
SHRI K. K. BHATTACHARYYA	Indian Valve Pvt Ltd, Nasik
SHRI S. SAHA (*Alternate*)	
SHRI V. M. AGGARWAL	Indian Water Works Association, New Delhi
SHRI S. K. NEOGI	Institution of P H Engineers India, Calcutta
SHRI A. K. SENGUPTA (*Alternate*)	
SHRI V. K. JAIN	Johnson Pedder Pvt Ltd, Mumbai
TECH MEMBER	Kerala Water Authority, Thiruvananthapuram
CHIEF ENGINEER (PS&G) (*Alternate*)	
SHRI R. D. KULKARNI	Kirloskar Brothers Ltd, Pune
SHRI S. V. JADAV (*Alternate*)	
SHRI HEMANT BERI	Leader Engineering Works, Jallundhar
SHRI H. K. ARORA (*Alternate*)	
CHIEF ENGINEER (RURAL)	Maharashtra WS & Sewerage Board, Mumbai
SUPERINTENDING ENGINEER (*Alternate*)	
SHRI J. P. S. JASS	Metro Sanitations Pvt Ltd, New Delhi
SHRI ARUN KANTI BISWAS	NEERI, Calcutta
SHRI D. K. KANUNGO	National Test House, Calcutta
SHRI R. KAPOOR (*Alternate*)	
CHIEF ENGINEER (WEST)	Northern Railway, New Delhi
SHRI V. K. SINHA	Schlumberger Industries (India) Ltd, Haryana
SHRI W. U. KHAN (*Alternate*)	

(Continued on page 17)

(*Continued from page* 16)

Members	*Representing*
SUPERINTENDING ENGINEER TAC (Q/C)	Uttar Pradesh Jal Nigam, Lucknow
EXECUTIVE ENGINEER TAC (*Alternate*)	
SHRI S. SUNDARAM	Vetrotex Limited, Hyderabad
SHRI S. S. SETHI, Director (Civ Engg)	Director General, BIS (*Ex-officio Member*)

Valves and Gates Subcommittee, CED 3:5

Convener	
HYDRAULIC ENGINEER	Brihanmumbai Mahanagar Palika, Mumbai
Members	
DY CHIEF	Building Material and Technology Promotion Council, New Delhi
SHRI P. K. JOSHI	BSJ Shau Manufacturer (India), Nagpur
DIRECTOR (*Alternate*)	
CHIEF ENGINEER (MAINTENANCE)	Bangalore Water Supply & Sewerage Board, Bangalore
DEPUTY CHIEF ENGINEER (COMMON SERVICES) (*Alternate*)	
WORKS MANAGER	Bombay Metals and Alloys Manufacturing Co Pvt Ltd, Mumbai
DEPUTY HYDRAULIC ENGINEER	Brihanmumbai Mahanagar Palika, Mumbai
SSW (S&S)	Central Public Works Department, New Delhi
ASSISTANT DIRECTOR	Directorate General of Supplies and Disposals, New Delhi
ASSISTANT INSPECTION OFFICER (*Alternate*)	
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SHRI DEEPAK BELAPURE	R&D Multiples Metalcast Pvt Ltd, Mumbai
SHRI R. S. DHUMAL	Sant Valves Pvt Ltd, Jallundhar
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