

**DRAFTS IN  
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**DOCUMENT DESPATCH ADVICE**

Reference	Date
<b>CED 3/T-56,T- 14, T-33, T-81 &amp; T-29</b>	<b>14 01 2010</b>

**TECHNICAL COMMITTEE:**

**Sanitary Appliances and Water Fittings Sectional Committee, CED 3**

**ADDRESSED TO :**

1. Interested Members of Civil Engineering Division Council, CEDC
2. All Members of CED 3, 3:1, 3:2 and 3:5
3. All others interested

Dear Sir (s),

Please find enclosed the following draft standard/amendments:

<b>Doc No.</b>	<b>Title</b>
CED 3 (7650)	Draft Indian Standard Specification for Swing Check Type Reflux (Non – Return) Valves for Water Works Purpose: Part 2 Multi Door Pattern (First Revision of IS 5312 (Part 2) ICS 91.140.70
CED 3 (7741)	Draft Amendment No. 4 to IS 778:1984 Specification for Copper Alloy Gate, Globe and Check Valves for Water Works Purposes
CED 3 (7742)	Draft Amendment No. 3 to IS 2556 (Part 4):2004 Specification for Viterous Sanitary Appliances (Viterous China): Part 4 Specific Requirements of Wash Basins
CED 3 (7743)	Draft Amendment No. 2 to IS 13049:1991 Specification for Diaphragm type (Plastic Body) Float Operated Valves for Cold Water Services.
CED 3 (7744)	Draft Amendment No. 2 to IS 2548(Part 2) Specification for Plastic Seats and Covers for Water Closets: Part 2 Thermoplastic Seats and Covers

Kindly examine the draft standard/amendments and forward your views stating any difficulties which you are likely to experience in your business or profession, if these are finally adopted as National Standard or Amendment to National Standards.

Last Date for comments: **15 04 2010**

Comments, if any, may please be made in the format as given overleaf and mailed to the undersigned at the above address.

In case no comments are received or comments received are of editorial nature, you will kindly permit us to presume your approval for the above documents as finalized. However, in case of comments of technical in nature are received then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee.

The documents are also hosted on BIS website [www.bis.org.in](http://www.bis.org.in).

Thanking you,

Yours faithfully,

(A.K. Saini)  
Secretary & Head (Civil Engg.)  
email : [ced@bis.org.in](mailto:ced@bis.org.in)

Encl: as above

For BIS use only

Doc: CED 3 (7650)

Bureau of Indian Standards

*Draft Indian Standard*

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**SPECIFICATION FOR SWING CHECK TYPE REFLUX  
(NON - RETURN) VALVES FOR WATER WORKS PURPOSE**

**PART 2: MULTI DOOR PATTERN  
[First Revision of IS 5312 (Part 2)]  
ICS 91.140.70**

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**Sanitary Appliances and Water Fittings  
Sectional Committee, CED 3**

**Last Date of Comments  
is 15 04 2010**

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**FOREWORD**

(Formal Clauses will be added later)

This standard was first published in 1986. In this revision following major modifications have been made:

- a) Minimum nominal size of valve has been changed to 600 mm so as to keep the common size in Part 1 and Part 2 of the standard as 600mm only,

- b) Minimum number of suspension lugs and doors have been specified,
- c) Requirements of mass of valves have been deleted in accordance with IS 5312 (Part 1):2004 Specification for swing check type reflux (Non - Return) valves for water works purpose Part 2: Single door pattern and IS 14846: 2000 ' Sluice Valves for water works purposes (50 to 1200 mm size) – Specification.'
- d) Other changes keeping in view the current manufacturing practices in the country have been made.

These are essentially non – return valves permitting water to flow in one direction only and check return flow. The operation is dependent on velocity of flow and weight of door suitably disposed, having no external means of control. In large diameter pipes (above 600 mm), the door in single – door pattern, takes longer to close thereby getting caught in return flow, causing slam. Therefore, multi – door pattern is resorted to for large sizes. Some times a smaller size may also call for a multi – door design particularly in systems where propensity for a door to slam is high.

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.

Bureau of Indian Standards

*Draft Indian Standard*

**SPECIFICATION FOR SWING CHECK TYPE REFLUX  
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**PART 2: MULTI DOOR PATTERN  
[First Revision of IS 5312 (Part 2)]  
ICS 91.140.70**

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**Sanitary Appliances and Water Fittings  
Sectional Committee, CED 3**

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## **1 SCOPE**

This standard (Part 2) covers requirements for flanged reflux (non – return) valves of multi-door, swing check type used for water works purpose of sizes from 600 to 1200 mm.

## **2 REFERENCES**

The standards given in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards given in Annex A.

## **3 CLASS OF VALVE**

Class of reflux valves shall be designated by nominal pressure (PN), defined as the maximum permissible gauge working pressure in MPa as PN 0.6 and PN 1.0.

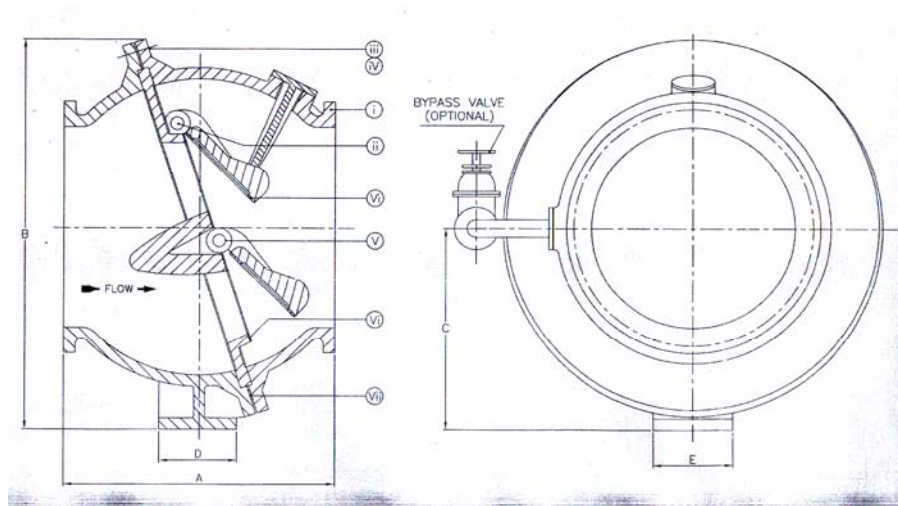
## **4 NOMINAL SIZES**

**4.1** The valves shall be of the following nominal sizes:

600, 700, 750, 800, 900, 1000, 1100 and 1200 mm

**4.1.1** The nominal size shall refer to the nominal bore of the water way.

**4.2** Typical illustration of swing check type reflux valve is given in Fig.1



<b>SI No.</b>	<b>Component</b>	<b>SI No.</b>	<b>Component</b>
i)	Body	v)	Bearing Bushes
ii)	Hinge Pin	vi)	Face and Seat Rings
iii)	Bolts	vii)	Flange Jointing Material
iv)	Nuts		

**Fig. 1 Typical Multi Door Check Valve**

## 5 MATERIALS

The materials used for the manufacture of different component parts of valves shall conform to the requirements given in Table 1. Where alternative materials are specified in Table 1, these may be used with the approval of the purchaser.

**Table 1 Materials for Different Component Parts of Reflux Valves**  
(Clause 5)

Sl. No.	Component	Basic Materials			Alternative Materials		
		Material	Ref to IS	Grade or Designation	Material	Ref to IS	Grade or Designation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Body with hinge, door and	Grey cast iron	IS 210	FG 260	Spheroidal or Nodular Iron	IS 1865	500 / 7 or 400/12

	diaphragm				Cast steel	IS 1030	230 – 450 W
ii)	Hinge Pin	Stainless Steel	IS 6603	12 Cr 12	Stainless steel	IS 6603	04 Cr17 Ni 12 Mo2 or 04 Cr 19 Ni 9 or 15 Cr 16 Ni2 HT2
					High tensile brass	IS 320	
iii)	Bolts	Carbon steel	IS 1363 (Part 1)	Class 4.6	--	--	
iv)	Nuts, nuts for hinge pins	Carbon steel	IS 1363 (Part 3)	Class 4.0	--	--	--
v)	Bearing bushes	Leaded tin bronze	IS 318	LTB-2	PTFE/Rein-forced PTFE	--	--
vi)	Face and seat rings	Leaded tin bronze	IS 318	LTB-2	Leaded tin bronze with 2% Nickel	--	--
					Stainless steel	IS 6603	04Cr19 Ni.9
vii)	Flange jointing material	Rubber	IS 638	--	--	--	--

## 6 BODY ENDS

### 6.1 Flanged Body Ends

Unless otherwise specified in the contract or order dimensions shall comply with the requirements of IS 1538.

6.2 Flanges shall be drilled unless otherwise specified and bolt holes shall be 'off

Centers'. Occasionally, a few bolt holes may require tapping to admit a stiffening rib on the body.

6.3 The dimensions of the valve shall be as given in Table 2.

**Table 2 Dimensions of Valves**  
(Clause 6.3 and Fig.1)

All dimensions in millimetres

Size	Length Over Flanges A	Overall Height B	Height of Center From Duck Foot C	Size of Duck Foot D x E
(1)	(2)	(3)	(4)	(5)
600	940	1335	685	250 x 250
700	1000	1445	750	300 x 375
750	1045	1445	750	300 x 375
800	1118	1555	810	300 x 375
900	1250	1660	860	300 x 375
1000	1250	1730	915	300 x 375

1100	1396	2070	1080	400 x 450
1200	1500	2250	1175	400 x 450

The tolerance on the face to face dimensions shall be as follows

Face to Face Dimension	Tolerances
600 mm upto and including 800 mm	± 4 mm
Above 800 mm upto and including 1000 mm	± 5 mm
Above 1000 mm	± 6 mm

## 7 DESIGN AND MANUFACTURE

### 7.1 Body

The body may be made in two parts – inlet shell and outlet shell. The inlet shell shall have an integral duck foot, for support.

### 7.2 Diaphragm

Diaphragm shall be fitted between inlet and outlet shells. The parts in the diaphragm should be so designed as to induce minimum head loss in the flow through the valve.

### 7.3 Water Way Area

The area of the waterway through the multi openings in the diaphragm shall not be less than the bore area.

### 7.4 Inlet and Outlet Shell Connections

The attachment of the inlet to outlet shell of the body shall be adequate to withstand the appropriate test pressure, service conditions and the mechanical loads encountered in the operation. All valves shall have bolted connection. Size of the bolts or studs shall not be less than 22 mm.

### 7.5 Seats

Seat rings shall be securely fixed such as press fitted and riveted so as to preclude their becoming loose in service. Standard countersunk screws shall not be used.

### 7.6 Door

The door shall be integral with the hinge and shall have a flat seating face.

## 7.7 Lugs

Minimum two (2) nos. suspension lugs shall be cast integrally on the diaphragm plate corresponding to each door and shall be of adequate strength.

## 7.8 Number of Doors

<u>Size of valve</u>	<u>No. of doors</u>
	Min
600 and 800 mm	2
900 to 1200 mm	3

## 7.9 By-pass Connection

By-pass are not standard items on valve, but if required, it is recommended that they shall be made for connection between the inlet and outlet shell of the valve. By-pass valves shall be of same rating as the main valve and conform to IS14846 and the minimum size of the by-pass arrangement shall be indicated below:

<b>Size of valve</b>	<b>Min. Size of By-pass Arrangement</b>
600 mm	80 mm
700 mm to 1200 mm	100 mm

## 8 COATING

**8.1** All coatings shall be carried out after satisfactory testing of the valves prior to despatch. All the un-machined 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 surface shall be painted with one coat of aluminum red oxide primer.

**8.2** 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 *spray only* for exterior application as approved by the purchaser.

Notes -

1. The valves may be assembled without coating if the purchasing organization specially desires to inspect the assembled valves without any coating.

2. Some specialized coating like epoxy, may call for primer coating immediately after grit blasting of castings. Such valves may be offered for inspection in primer coated condition.

## 9 TESTING

**9.1** Before coating each valve shall be subjected to hydrostatic test given in **9.2** and **9.3**. Test shall be carried out with water. Test pressure and duration of test shall be as specified in Table 3.

**Table 3 Test Pressure (Gauge) and Test Duration of Valves**  
(Clause 9.1)

PN Rating of Valve	Test	Test Pressure (Gauge), Min MPa (Kg/cm <sup>2</sup> )	Test Duration, Min Minutes
PN 0.6	Body test	9	5
	Seat test	6	2
PN 1.0	Body test	15	5
	Seat test	10	2

### 9.2 Seat Test

The valve shall be placed in the horizontal position and the outlet end shall be filled with water completely. With the inlet end open to atmosphere, there shall preferably be no leakage when the outlet end of the valve is subjected to hydrostatic, non-shock seat test pressure as given in Table 3 for two minutes. Minor leakage from seats may be observed but it must be arrested within 30 mm<sup>3</sup> /s X Nominal Bore (in metre).

### 9.3 Body Test

Water shall be filled completely in the body. When the body is subjected to hydrostatic, non-shock body test pressures from the inlet end as given in Table 3 for five minutes, there shall be no leakage or permanent distortion of any component part under the test.

## 10 INSPECTION

The purchaser or his authorized representative shall have free access to the works of the manufacturer at all reasonable times to inspect the valve at any stage of manufacture and to reject any material which does not conform to the specified requirements.

## **11 INFORMATION TO BE SUPPLIED WITH ENQUIRY OR ORDER**

The following information is to be supplied by the purchaser with enquiry or order:

- a) Size of valve,
- b) Maximum working pressure,
- c) Material of body, diaphragm and doors,
- d) Whether by – pass arrangement is required,
- e) Flow velocity or volumetric flow rate,
- f) Whether water is corrosive and if so, details to be given, and
- g) Flange details if other than mentioned in this standard.

## **12 MARKING**

**12.1** Following information shall be cast on each valve body in raised letter:

- a) Manufacturer's name or trade mark,
- b) Nominal pressure of valve (PN 0.6 or PN 1.0),
- c) Size of valve, in mm,
- d) Direction of flow, and
- e) Heat No. of cast.

### **12.2 BIS Certification Marking**

Each valve may also be marked with the Standard Mark.

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

## **13 PACKAGING AND STORAGE**

**13.1** Valve shall be complete in all respects when shipped.

**13.2** Valves shall be drained of residual water and the doors harnessed in the closed position to prevent chattering of body seats and door faces during transit.

**13.3** Body ends shall be suitably sealed to exclude foreign matter during transit and storage. Valves shall be stored in roofed store and away from dirt.

**ANNEX A**  
(*Clause 2*)

**LIST OF REFERRED INDIAN STANDARDS**

<i>IS No.</i>	<i>Title</i>
210:1993	Grey iron castings — Specification ( <i>fourth revision</i> )
318:1981	Specification for leaded tin bronze ingots and castings ( <i>second revision</i> )
320:1980	Specification for high tensile brass rods and sections (other than forging stock) ( <i>second revision</i> )
341:1973	Black Japan types A, B and C ( <i>first revision</i> )
638:1979	Specification for sheet rubber jointing and rubber insertion jointing ( <i>second revision</i> )
778:1984	Specification for copper alloy gate, globe and check valves for water works purposes ( <i>fourth revision</i> )
1030:1998	Carbon steel castings for general engineering purposes ( <i>fifth revision</i> )
1363	Hexagon head bolts, screws and nuts of product grade C
Part 1:2002	Hexagon head bolts (size range M 5 to M 64) ( <i>fourth revision</i> )
Part 3:1992	Hexagon nuts (size range M 5 to M 64) ( <i>third revision</i> )
1538:1993	Cast iron pipe fittings for pressure pipes for water, gas and sewage ( <i>third revision</i> )
1865:1991	Iron castings with spheroidal or nodular graphite ( <i>third revision</i> )
2932:1993	Enamel, synthetic, exterior (a) undercoating (b) finishing — Specification ( <i>second revision</i> )
6603:2001	Stainless steel bars and flats — Specification ( <i>first revision</i> )
9862:1981	Ready mixed paint, brushing, bituminous, black lead free,

acid alkali, water and chlorine resisting

14846:2000

Sluice valve for water works purposes (50 to 1200 mm size) - Specification

**Doc: CED 3 (7741)**

**BUREAU OF INDIAN STANDARDS**

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*Draft* **AMENDMENT NO. 4**

**TO**

**IS 778:1984 SPECIFICATION FOR COPPER ALLOY GATE, GLOBE AND CHECK VALVES FOR WATER WORKS PURPOSES**

(*Page 10, Clause 7.4.1*) - Insert the following note at the end:

'Valves may also be supplied in glandless design. Design of glandless valve shall be as agreed to between buyer and supplier.'

(CED 3)

**Doc: CED 3 (7742)**

**BUREAU OF INDIAN STANDARDS**

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*Draft* **AMENDMENT NO. 3**

**TO**

**IS 2556 (PART 4):2004 SPECIFICATION FOR VITEROUS SANITARY  
APPLICANCES (VITEROUS CHINA): PART 4 SPECIFIC  
REQUIREMENTS OF WASH BASINS  
(*Fourth Revision*)**

(*Page 5, Clause 6.5, Para 1*) - Delete

(CED 3)

**Doc: CED 3 (7743)**

**BUREAU OF INDIAN STANDARDS**

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*Draft* **AMENDMENT NO. 2**

**TO**

**IS 13049:1991 SPECIFICATION FOR DIAPHRAGM TYPE (PLASTIC BODY)  
FLOAT OPERATED VALVES FOR COLD WATER SERVICES**

(*Page 6, Annex E*) - Substitute following for the existing:

## Annex E

### FLOW TEST

#### **E-1 LOW PRESSURE SEAT TEST**

##### **E-1.1 Apparatus**

**E-1.1.1** A test rig [see Fig. 4 a)] capable of maintaining  $1 \pm 0.1$  m head of water at the seat of the valve under test, comprising a cistern, connected through 15 mm copper pipe work to the specimen valve via a controlling gate valve.

##### **E-1.2 Procedure**

Fit the float operated valve (installed with the LP seat) to be tested together with its discharge arrangement. Remove the float. Cause the valve to discharge water from cistern A into container B [see Fig. 4 a)] for a period of  $140 \pm 5$  s whilst maintaining, for the duration of the test the water level in cistern A at a height of  $1 \pm 0.1$  m above the centre of the inlet of the valve.

##### **E-1.3 Result**

Record the amount of water in container B.

#### **E-2 HIGH PRESSURE SEAT TEST**

##### **E-2.1 Apparatus**

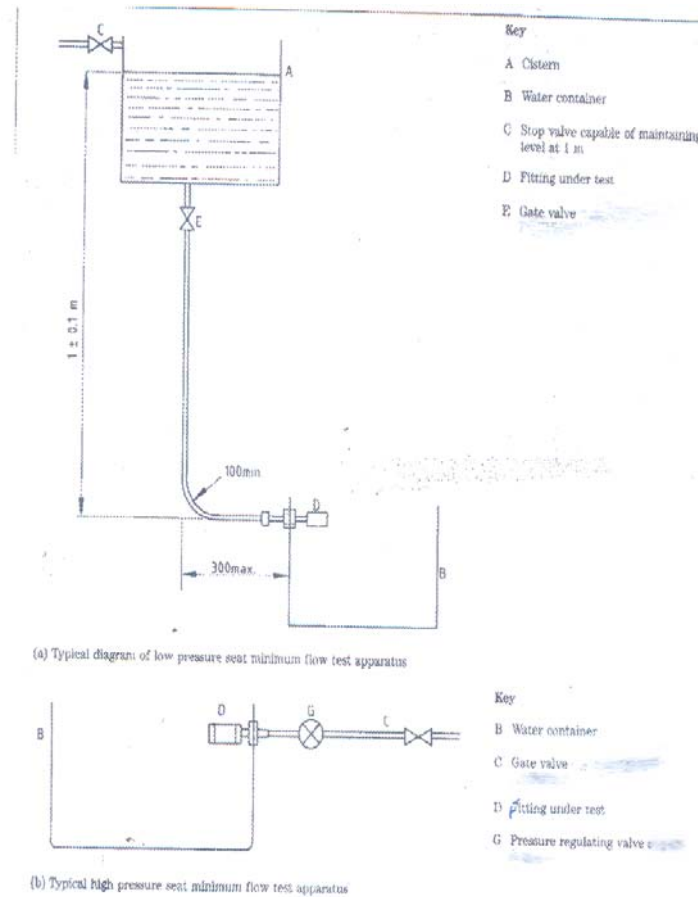
**E-2.1.1** A test rig [see Fig 4 b)] capable of maintaining a constant pressure of  $0.35 \pm 0.01$  MPa the inlet of the valve under test , connected through 15 mm copper pipe work to the specimen valve via a controlling gate valve.

##### **E-2.2 Procedure**

Fit the float operated valve (installed with HP seat) to be tested together with its discharge arrangement. Remove the float. Cause the valve to discharge water into container B for a period of  $140 \pm 5$  s whilst maintaining, for the duration of the test the constant pressure of  $0.35 \pm 0.01$  MPa at the seat.

##### **E-3 Result**

Record the amount of water in container B.



All dimensions are in millimeters unless otherwise specified

**Fig 4 Flow Test Apparatus**

(CED 3)

**Doc: CED 3 (7744)**

**BUREAU OF INDIAN STANDARDS**

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**DRAFT AMENDMENT NO. 2**

**TO**

**2548 (PART 2):1996 SPECIFICATION FOR PLASTIC SEATS  
AND COVERS FOR WATER CLOSETS :  
PART 2 THERMOPLASTIC SEATS AND COVERS**

(Page 3, Table 1) - Substitute following for the existing:

**Table 1 Dimensions of Seats and Covers**  
(Clauses 6.1 , 6.2 and Fig 1)

All dimensions in millimeters

SI No.	Description	Dimension	
		Min	Max
(1)	(2)	(3)	(4)
i)	Distance from centre line of hinge bolts to extreme edge of rim at front , <i>A</i>	410	445
ii)	Length of opening at longest point, <i>B</i>	270	310
iii)	Width of opening at widest point, <i>C</i>	215	245
iv)	Overall width at widest point, <i>D</i>	370	385
v)	Distance between inner and outer rims, <i>E</i>	60	-
vi)	Centre-to-centre distance of seat bolt holes, <i>F</i>	125	175
vii)	Distance from centre line hinges bolts to inner rim of seat at the back, <i>G</i>	80	-
viii)	Thickness of seat at thinnest point	3	-
ix)	Thickness of cover at thinnest point	3	-

NOTE – Some hinging devices are made so as to provide adjustment in the longitudinal direction. This is not precluded by these figures.

(CED 3)