BRITISH STANDARD

BS 1212-3: 1990

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Float operated valves —

Part 3: Specification for diaphragm type float operated valves (plastics bodied) for cold water services only (excluding floats)

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Building Services Standards Policy Committee (SEB/-) to Technical Committee SEB/2, upon which the following bodies were represented:

Association of Manufacturers of Domestic Electrical Appliances
Association of Manufacturers of Domestic Unvented Supply Systems Equipment (MODUSSE)
Association of Water Officers Ltd.
British Bathroom Council
British Gas plc
British Non-Ferrous Metals Federation
British Plastics Federation
British Plumbing Fittings Manufacturers' Association
British Valve and Actuator Manufacturers' Association
Builders Merchants' Federation
Consumer Policy Committee of BSI
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Department of Trade and Industry (National Weights and Measures Laboratory)
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Metal Sink Manufacturers' Association
National Association of Plumbing, Heating and Mechanical Services Contractors
Royal Institute of British Architects
Society of British Gas Industries
South London Consortium
Water Companies Association
Water Services Association of England and Wales

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Contents

Foreword

This Part of BS 1212 has been prepared under the direction of the Building Services Standards Committee. It is a revision of BS 1212-3:1979, which is withdrawn.

This Part of BS 1212 specifies the operational requirements of diaphragm type float operated valves (plastics bodied) (excluding floats) for use with cold water services only. It is a performance-based specification and the dimensional requirements are solely those essential to ensure fitting and interchangeability of complete valves.

The new features incorporated in this revision of BS 1212-3 include the following:

a) bottom entry requirements;

b) high pressure flow requirements;

c) rationalization to one size of float;

d) float attachment requirements;

e) dynamic pressure test requirements;

f) increased shut-off performance requirements.

The reference to lever ratio given in BS 1212-3:1979 has been deleted.

Terms of measurement are expressed in metric units except for pipe thread sizes which are retained in imperial units to accord with BS 2779.

For plastics floats, the designations specified in BS 2456 have been used.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1 Scope

This Part of BS 1212 specifies the performance requirements, materials, certain dimensions and tolerances of diaphragm type float operated valves (plastics bodied) of nominal size ½ for cold water services only, capable of accepting interchangeable low or high pressure renewable seats for use at pressure up to and including 3 bar[1)] and up to and including 14 bar respectively (see **9.1**) and intended for use with 114 S or 114 NS floats (plastics) conforming to BS 2456.

NOTE 1 The nominal size is that corresponding with the Class G ½ B pipe thread specified in BS 2779.
NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 1212 the following definitions apply.

NOTE For further definitions see BS 4118.

2.1
diaphragm type float operated valve

a float operated valve in which the flow of water is controlled by the flexing of a diaphragm and which incorporates or is fitted with a discharge arrangement to conduct water into the cistern to which the float operated valve is to be fitted

2.2
effective warning water level

the level when water reaches 10 mm above the invert of a side entry connection warning pipe or 10 mm above the overflow level of a bottom connection warning pipe in a British Standard flushing cistern

NOTE Figure 1 gives an illustration of effective warning level in relation to other commonly defined levels in a British Standard flushing cistern.

2.3 datum level for backflow prevention test purposes

2.3.1

for side or bottom entry diaphragm type float operated valves with a horizontal seat centre line, the horizontal centre line at the seat

2.3.2

for side or bottom entry diaphragm type float operated valves having no horizontal seat centre line, the interface of the seat and diaphragm

3 Designation for ordering

Diaphragm type float operated valves shall be designated by the following:

a) the words “diaphragm type float operated valve” followed by the number of this British Standard in the form of BS 1212/3.

b) whether side or bottom entry is required;

c) if bottom entry, the height of the effective warning water level (see Figure 2).

Example. “Diaphragm type float operated valve, BS 1212/3 bottom entry, H = 250 mm”.

4 Marking

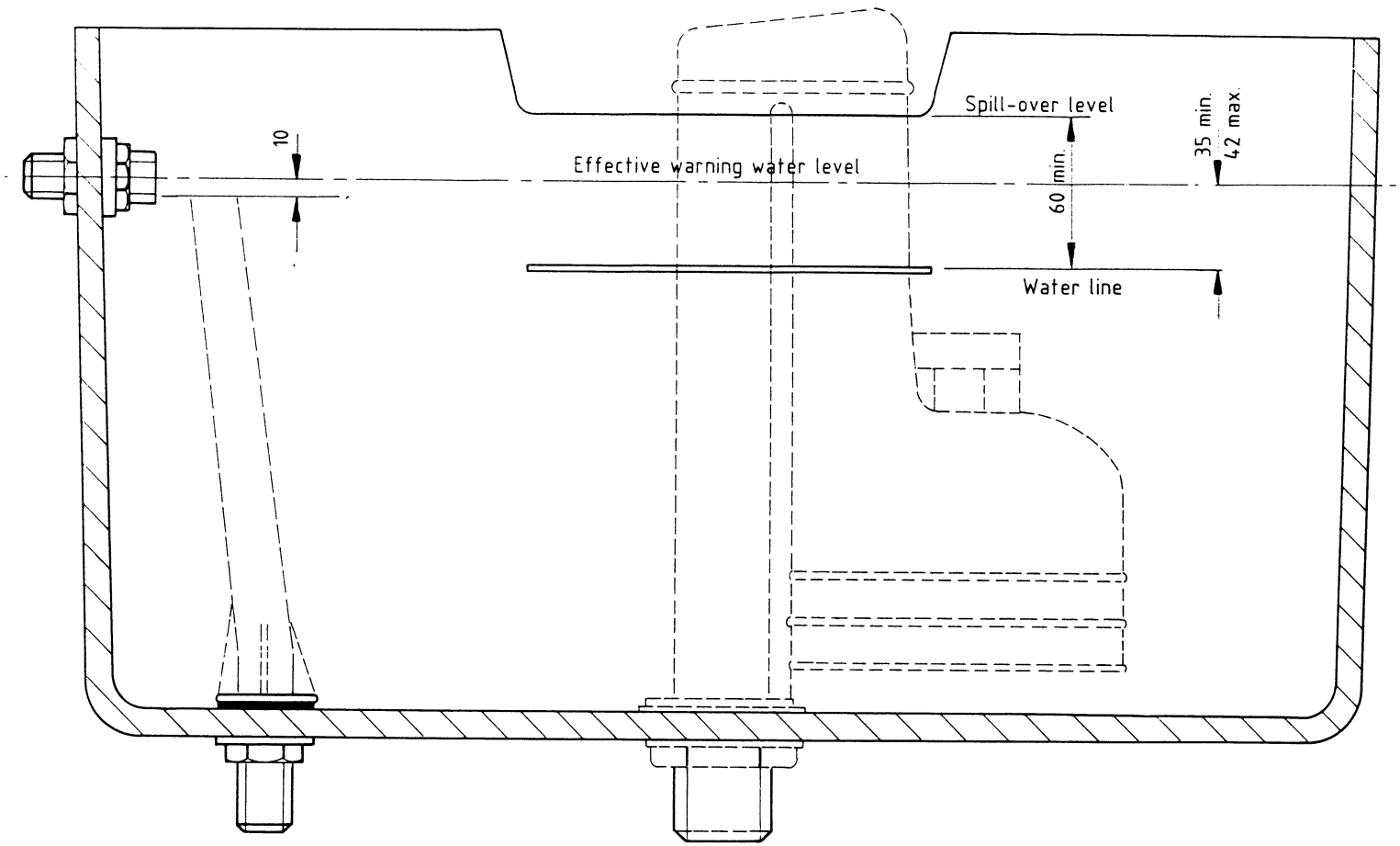
A diaphragm type float operated valve shall be permanently and legibly marked with the following information in such a way as not to deform any working part:

a) the number of this British Standard, in the form BS 1212/3[2)];

b) the manufacturer’s name or trade mark;

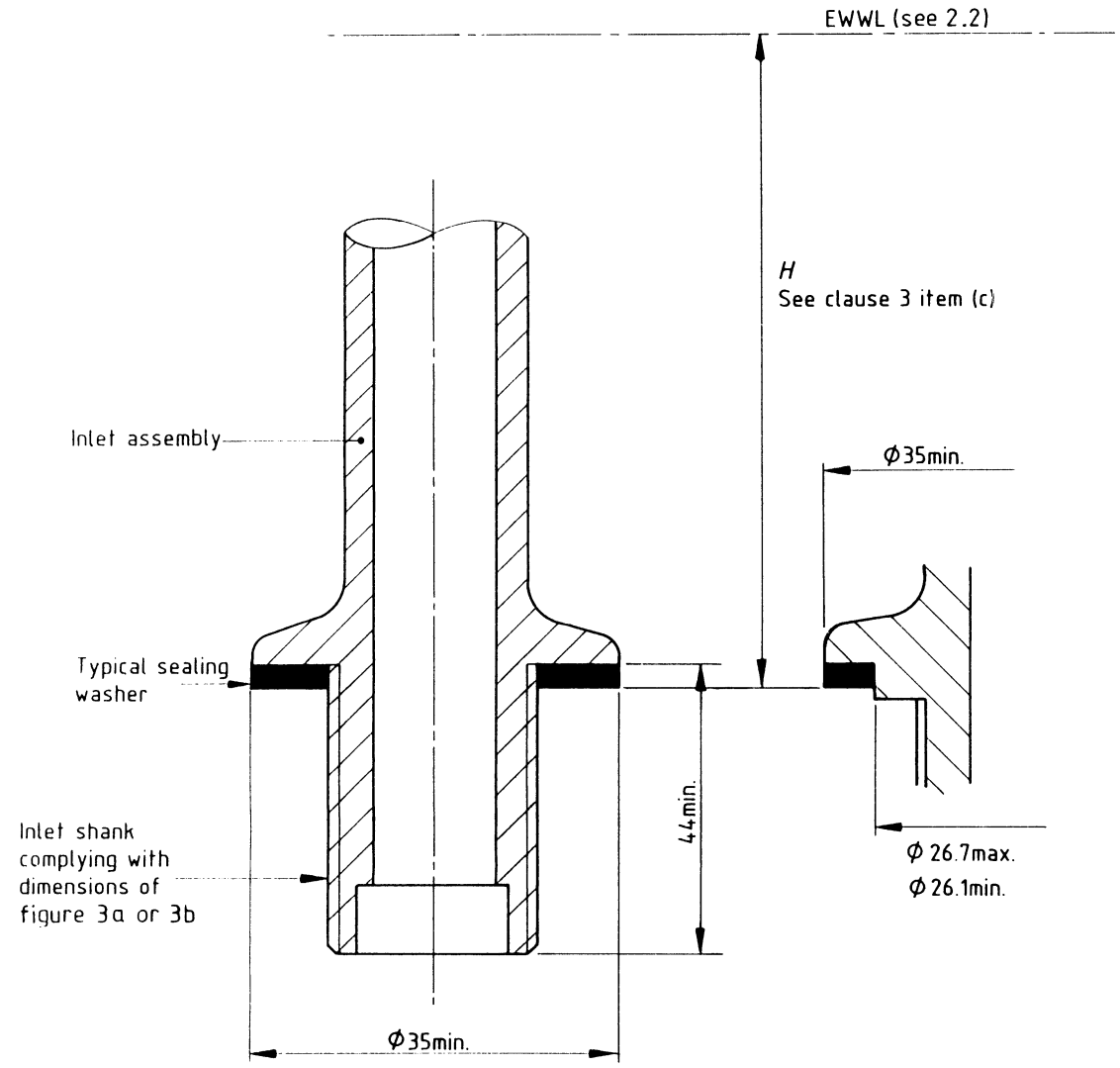
c) the words “cold water only”.

[1)] 1 bar = 10^5 N/m^2 = 10^5 Pa.
[2)] Marking BS 1212/3 on or in relation to a product represents a manufacturer’s declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.



All dimensions are in millimetres.

Figure 1 — Illustration of effective warning water level in relation to other commonly defined levels in a British Standard flushing cistern



(a) Without spigot (b) With spigot

All dimensions are in millimetres.

Figure 2 — Bottom entry valve inlet arrangement

Section 2. Materials

5 Effect of non-metallic materials on water quality

When used under the conditions for which they are designed, non-metallic materials in contact with or likely to come into contact with potable water shall comply with BS 6920-1.

6 Plastics

With the exception of seats and backplate plungers, where no reworked material shall be used, the plastics parts of diaphragm type float operated valves shall be manufactured from materials containing, if required, the addition of not more than 15 % of the manufacturer's own clean reworked material complying with this Part of BS 1212. No other reworked material shall be used.

NOTE When choosing plastics materials, manufacturers should take due account of the characteristics required for satisfactory use, i.e. mechanical, dimensional and chemical stability.

7 Metals

When components are manufactured from metals, the grade of material shall be chosen from the following list:

a) backnuts, lever arm or lever arm assembly:	BS 2874 CZ 121; or
	BS 2874 CZ 132; or
	BS 2872 CZ 122; or
	BS 2872 CZ 129;
b) split cotter pin:	BS 2873 CZ 108.

Section 3. Design, construction and dimensions

8 Inlet connection

8.1 General

Both side and bottom entry connection valves (for fitting into cisterns complying with BS 1125) shall incorporate an inlet assembly with a connection designed for use with either spigot or compression type connectors complying with BS 864-2 and shall have the dimensions given in (a) or (b) of Figure 3, as appropriate.

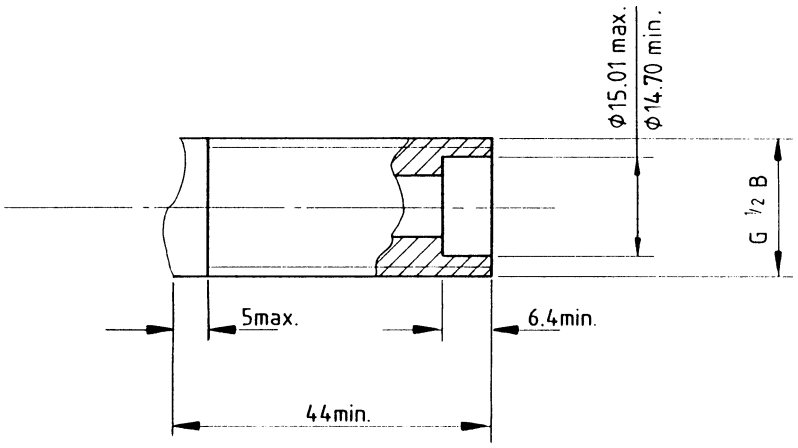
8.2 Bottom inlet connection

A bottom inlet assembly shall incorporate either an integral flange without spigot or an integral flange with spigot and shall have the dimensions given in (a) or (b) of Figure 2, as appropriate.

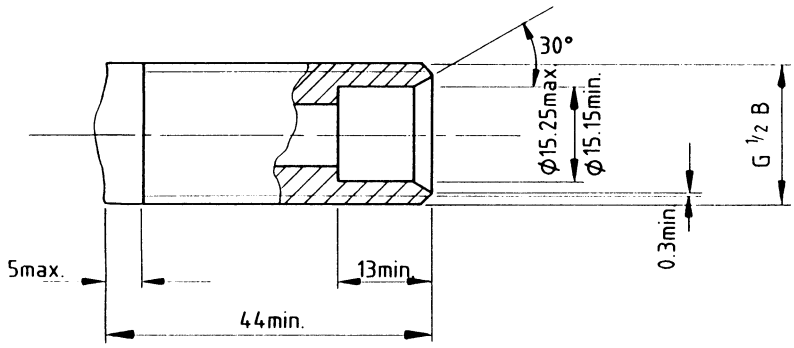
A bottom inlet assembly shall be supplied with a sealing washer to facilitate connection into the cistern.

8.3 Locking stay

A bottom entry valve assembly shall be supplied with an adjustable lockable stay at the upper end to act as a stop against the wall of the cistern.



(a) Side inlet shank for spigot type connector



(b) Side inlet shank for compression type connector

All linear dimensions are in millimetres.

Figure 3 — Side inlet shank connectors

9 Seats

9.1 Number of seats

Every valve shall be supplied with interchangeable high pressure (HP) and low pressure (LP) seats.

NOTE The HP seat is intended for use with water pressures from a minimum of 3 bar to a maximum of 14 bar and the LP seat is intended for use with water pressure of 3 bar and below.

9.2 Colour

Seats shall be coloured white for HP, and red for LP.

9.3 Distance between seat and diaphragm

The minimum distance between the seat outlet orifice and the shutting off face of the diaphragm shall be 1.5 mm when in the fully open position.

10 Backnuts

10.1 General

Backnuts shall be of the following types (see Figure 4).

a) *Type (a)*. With a flange as dimensioned in (a) of Figure 4.

b) *Type (b)*. With a spigot as dimensioned in (b) of Figure 4.

c) *Type (c)*. Without a flange as dimensioned in (c) of Figure 4.

10.2 Backnuts for use with side entry valves

An inlet shank or shank assembly shall be provided with two backnuts, one of which shall be type (b) (see **10.1**).

10.3 Backnuts for use with bottom entry valves

An inlet shank without an integral spigot, see (a) of Figure 2, shall be fitted with a type (b) backnut (see **10.1**).

An inlet shank incorporating an integral spigot, see (b) of Figure 2, shall be fitted with either a type (a), type (b) or type (c) backnut (see **10.1**).

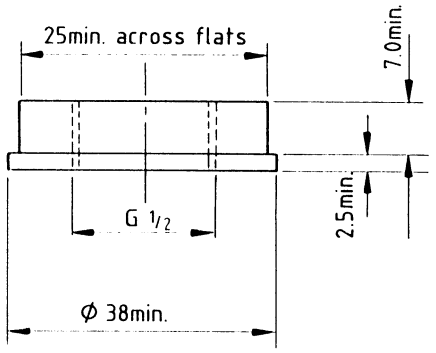
11 Float arm or float arm assembly

11.1 Adjustment

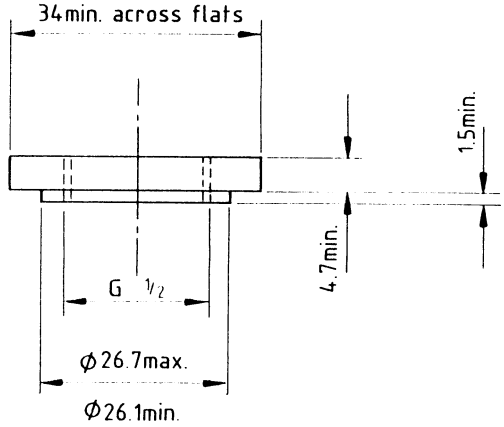
The valve shall be provided with a positive, readily accessible, method of adjustment and locking of the float's position without bending the lever to set the water level in the cistern into which the valve is fitted.

11.2 Float connecting dimensions

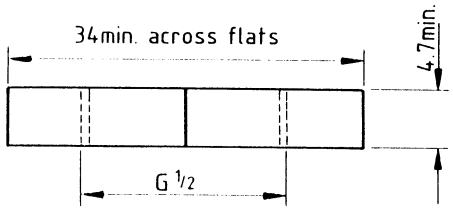
The float end of the float arm or float arm assembly shall be provided with a screwed portion for the attachment of a 114 S or 114 NS float complying with BS 2456 (see Figure 5).



(a) Backnut with flange



(b) Backnut with spigot



(c) Backnut without flange

All dimensions are in millimetres.

Figure 4 — Hexagonal backnuts

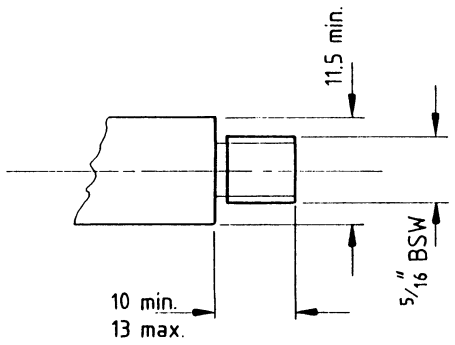
12 Discharge arrangement

12.1 Diaphragm type float operated valves shall comply with clause **15** (see note).

Where the discharge arrangement outlet point is above the datum level for backflow prevention test purposes, the construction shall not facilitate the subsequent fitting of any pipe or device to conduct water to a lower level.

NOTE Where the discharge arrangement outlet is below the datum level for backflow prevention test purposes it is permissible to incorporate one or more constantly open air inlets or backflow prevention devices.

12.2 The discharge arrangement shall not obstruct the fitting of the valve into a British Standard WC flushing cistern.



All dimensions are in millimetres unless otherwise stated.

Figure 5 — Float connecting dimensions

Section 4. Performance

13 Distortion and deflection

13.1 Backnuts and inlet shank

When tested as described in Appendix A there shall be no visible distortion of either the threads on the inlet shank or backnut(s) or of the flats of the backnut(s), that will effect the efficiency of the assembly.

13.2 Valve assembly

When tested as described in Appendix B the initial deflection measured at the end of the float arm or float arm assembly shall be not greater than 25 mm and the additional deflection shall be not greater than 12 mm, resulting in a total deflection of not more than 37 mm.

13.3 Float attachment

When tested as described in Appendix C the screwed portion of the float arm or float arm assembly for attachment of the float shall show no visible damage or distortion that will effect the efficiency of the assembly.

14 Hydraulic pressure

14.1 Static pressure

Whilst held in the closed position, a diaphragm type float operated valve shall be capable of withstanding a pressure of 20 + 0.25, – 0 bar for a period of 60 + 5, – 0 s without leaking.

14.2 Shut-off pressure

When tested as described in Appendix D a diaphragm type float operated valve when assembled in working condition and fitted with the appropriate seat and a 114 S or 114 NS float complying with BS 2456 shall withstand a pressure up to 3 bar for a LP seat and a presure up to 14 bar for a HP seat, as appropriate, without passing water.

14.3 Dynamic pressure on discharge arrangement

When tested as described in Appendix E a diaphragm type float operated valve together with its discharge arrangement shall show no permanent deformation or separation of any component part.

15 Backflow

When tested as described in Appendix F a diaphragm type float operated valve of either side or bottom inlet together with its discharge arrangement shall deliver no water into the catchpot.

NOTE For valves with bottom inlet connection which use the same valve body and discharge arrangement as a side entry valve, compliance may be achieved if results of tests on a side entry valve prove satisfactory.

16 Flow

When tested as described in Appendix G a diaphragm type float operated valve shall deliver a minimum of 9 L of water.

17 Endurance

When tested as described in Appendix H a diaphragm type float operated valve shall complete 200 000 cycles and subsequently satisfy the hydraulic pressure requirements of clause **14**.

Appendix A Distortion test for backnuts and inlet shank

A.1 Apparatus

A.1.1 *A test plate,* as shown in Figure 6, manufactured from material complying with grade 416S21 of BS 970-4, that has both flat surfaces prepared to a finish of 0.8 μm to 1.0 μm (Ra) (see BS 1134) when measured in all directions, and that has been hardened in oil or air at 950 °C to 1 020 °C and tempered at 150 °C to 250 °C.

A.1.2 *An open ended spanner,* which is a snug fit on the flats of the backnut.

A.2 Procedure

A.2.1 *Side entry*

Screw the backnut to be used on to the inlet shank and insert the assembly through the test plate (**A.1.1**) and secure with the second backnut to be used (see **10.2**).

Apply a torque of 15 N·m to the second backnut with the open ended spanner (**A.1.2**).

A.2.2 *Bottom entry*

Insert the inlet shank together with its sealing washer through the test plate (**A.1.1**) and secure with the backnut to be used (see **10.3**).

Apply a torque of 15 N·m to the backnut with the open ended spanner (**A.1.2**).

A.3 Result

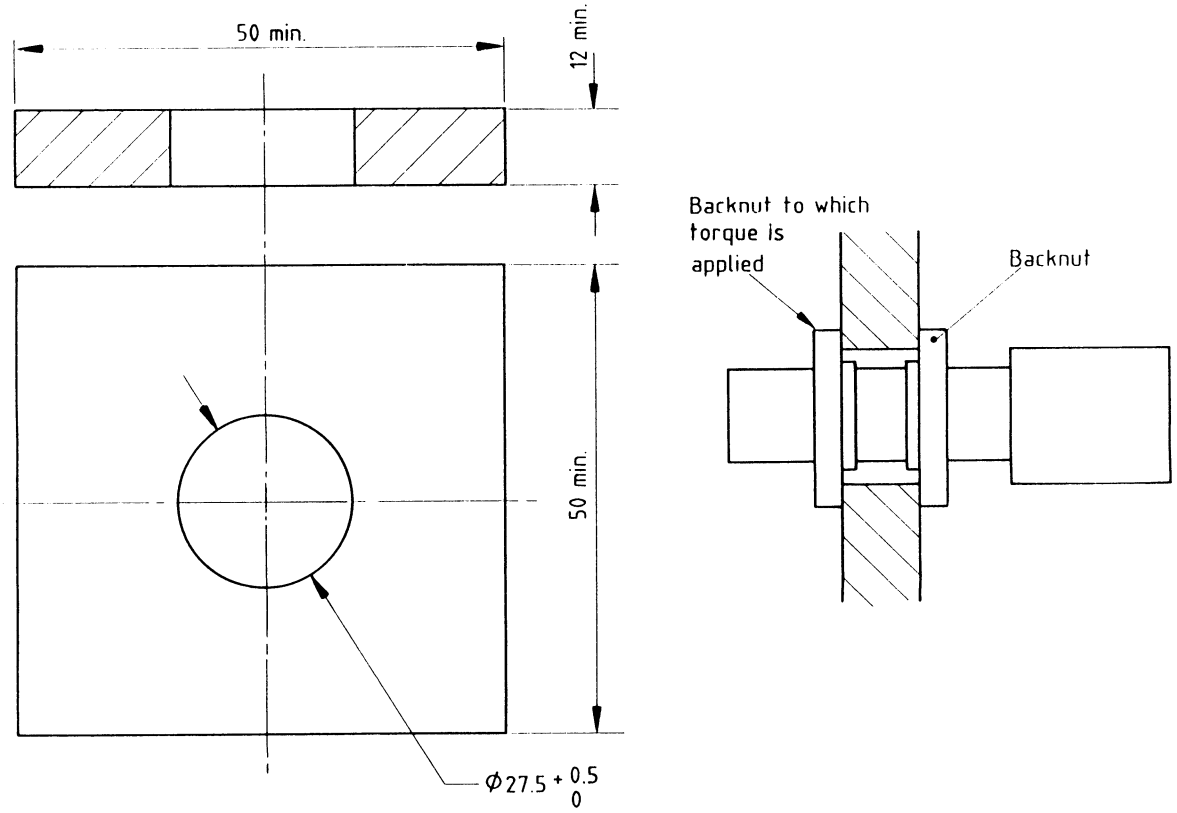
Record any visible distortion of the threads of either the inlet shank or the backnut(s) and of the flats of the backnut(s).

Appendix B Diaphragm type float operated valve assembly test

B.1 Procedure

B.1.1 *General*

Modify the valve to be tested by removing the diaphragm and substituting a rigid steel disc of the same diameter.



All dimensions are in millimetres.

Figure 6 — Inlet shank and backnuts test plate

B.1.2 ***For side entry valves***

Fit the assembled valve into a rigid test plate 12 mm minimum in thickness representing the vertical side of a cistern and position the inlet shank within the test plate so that the union nut end is 19 ± 1 mm behind the face of the test plate as shown in (a) of Figure 7.

B.1.3 ***For bottom entry valves***

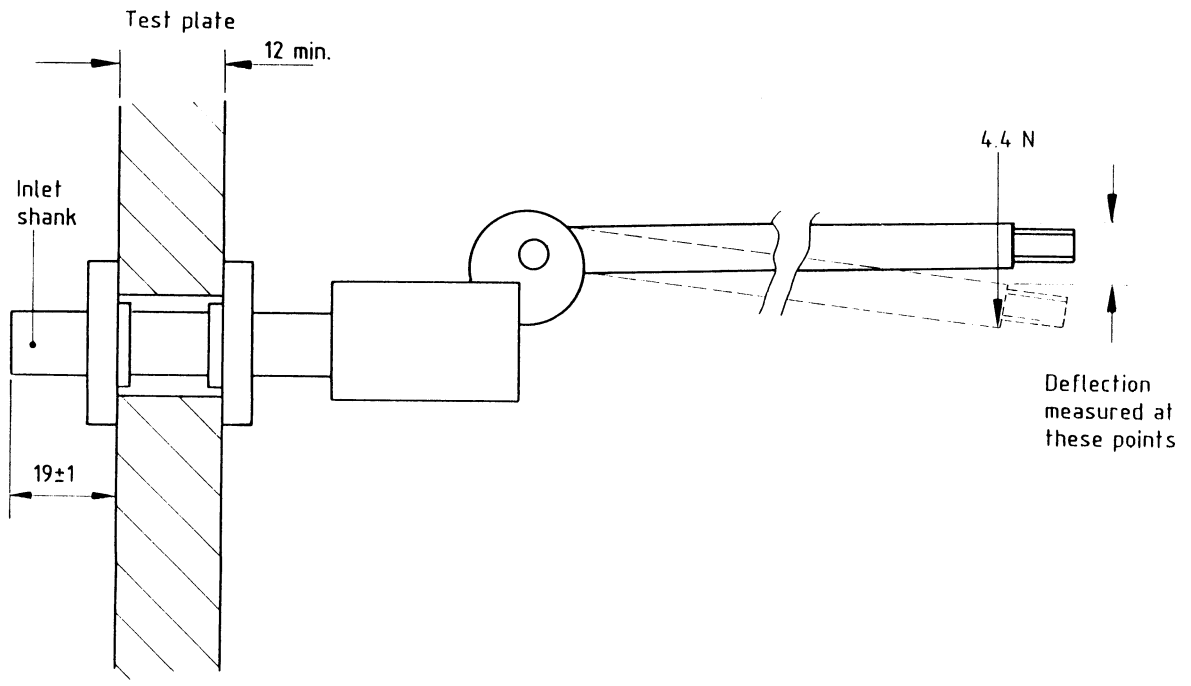
Fit the assembled valve into a rigid right angled test plate 12 mm minimum in thickness representing the base and vertical side of a cistern. Adjust and lock the stay to act as a stop against the face of the test plate representing the side of the cistern as shown in (b) of Figure 7.

B.1.4 ***Load***

Gradually apply a load of 4.4 + 0.1, – 0 N in the closing direction at the float connection as shown in Figure 7 and immediately record the deflection. Leave for 28 days in the loaded position.

B.2 Result

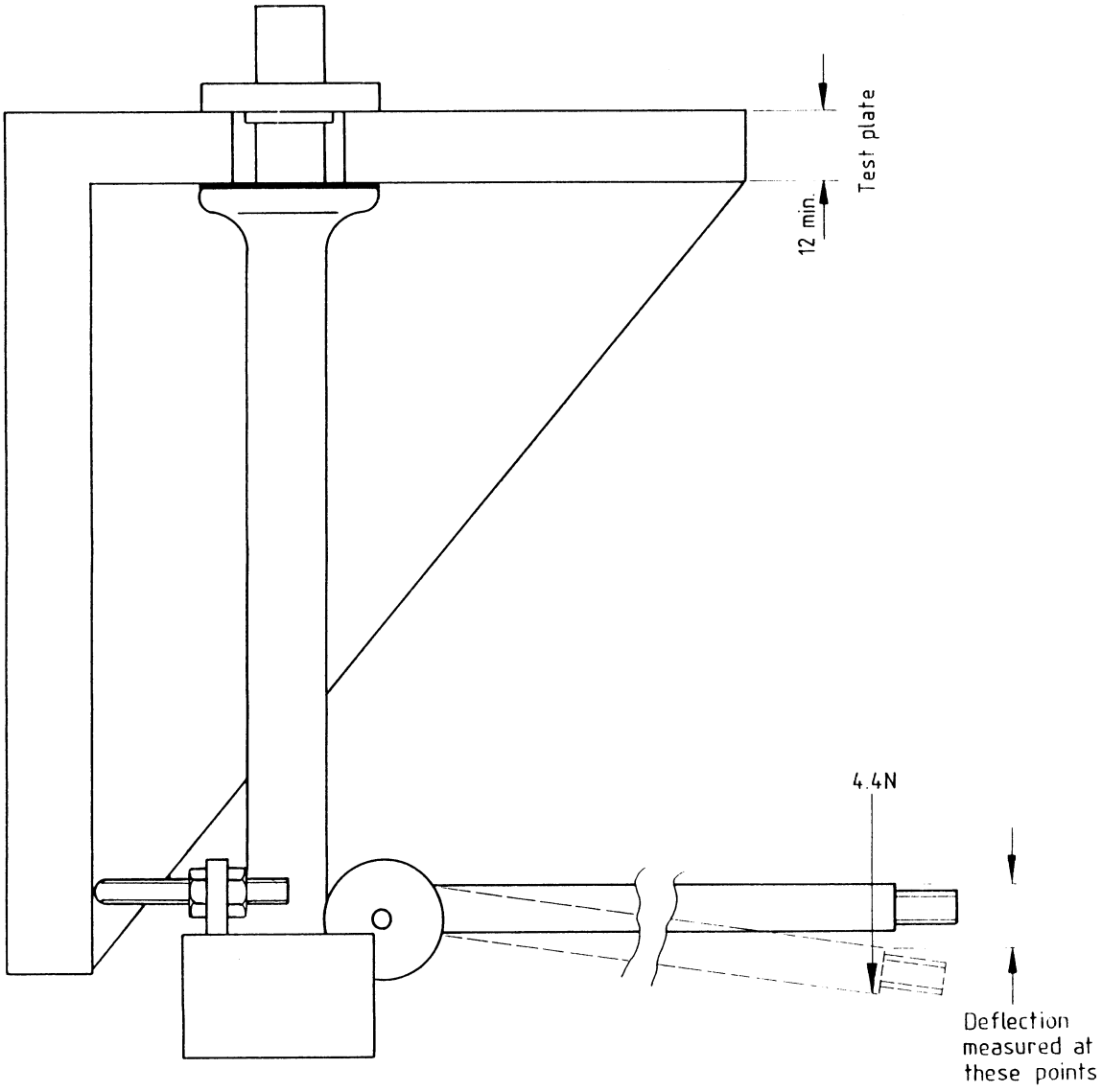
Having recorded the initial deflection immediately the load is applied, record the deflection again after 28 days.



(a) Side inlet.

All dimensions are in millimetres.

Figure 7 — Valve assembly deflection test



(b) Bottom inlet.

The dimension is in millimetres.

Table 7 — Valve assembly deflection test *(concluded)*

Appendix C Float attachment thread distortion test

C.1 Apparatus

C.1.1 *A clamp,* capable of holding the float arm or float arm assembly.

C.1.2 *A hexagonal shaped metallic test piece,* with a 5/16 in BSW female thread in one end as detailed in Figure 8.

C.1.3 *A torque wrench* with socket suitable for the metallic test piece, capable of imparting a torque of 1.7 + 0.1, – 0 N m.

C.1.4 *A* 10 ± 0.1 kg *weight.*

C.2 Procedure

C.2.1 Clamp the float arm or float arm assembly so that the screwed portion to be tested is positioned vertically downwards. Screw on the metallic test piece and apply a torque of 1.7 + 0.1, – 0 N m. Hang the 10 ± 0.1 kg weight co-axially from the test piece for a minimum period of 5 min.

C.2.2 Remove the weight and test piece.

C.3 Result

Record any visible signs of damage or distortion to the threads.

Appendix D Shut-off pressure test

D.1 Apparatus

D.1.1 *A cistern,* in which the float operated valve can be installed and which allows the attached float to be half immersed in water.

D.1.2 *A water supply,* capable of providing the required pressure.

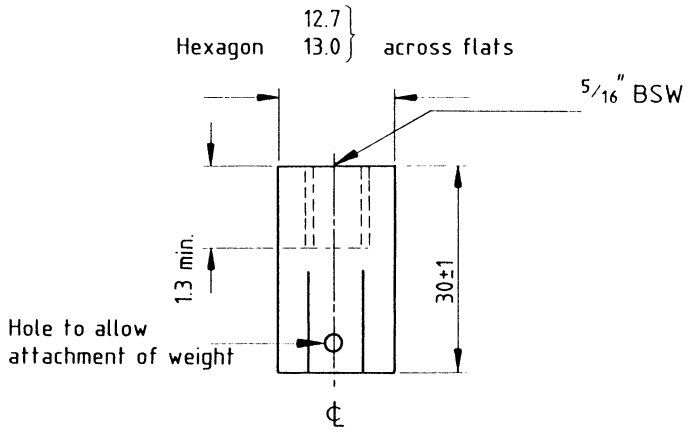
D.1.3 *A pressure gauge,* to indicate the test pressure.

D.2 Procedure

Install the float operated valve assembled with the appropriate seat in the cistern, but with the discharge arrangement removed. Fill the cistern with water until the float is immersed to approximately but not more than half its volume. Gradually apply a pressure up to 3 bar for a low pressure seat and 14 bar for a high pressure seat, for a period of 60 + 5, – 0 s.

D.3 Result

Record any evidence of the valve passing water.



All dimensions are in millimetres unless otherwise stated.

Figure 8 — Float attachment thread distortion test piece

Appendix E Method of test for effect of dynamic pressure on discharge arrangement

E.1 Apparatus

E.1.1 *A cold water supply,* capable of providing a dynamic pressure of 10 bar.

E.1.2 *Pressure gauge,* installed immediately upstream of the valve on test.

E.2 Procedure

Fit the float operated valve (installed with the HP seat) to be tested together with its discharge arrangement. Connect to the apparatus. With the valve held in the fully open position, gradually increase the supply pressure to 10 bar. Maintain this pressure for 60 + 5, – 0 s.

E.3 Result

Record any permanent deformation or separation of components.

Appendix F Backflow prevention test

F.1 Apparatus (see Figure 9)

F.1.1 *A means, for producing and maintaining an absolute pressure within a vacuum vessel* of 0.2 bar, e.g. pump or injector, (marked (a) on Figure 9).

F.1.2 *A* 50 mm *full way gate valve* in accordance with BS 5154 (marked (b) on Figure 9).

F.1.3 *A vacuum vessel* (marked (c) on Figure 9), comprising a galvanized mild steel cylinder, type reference Y58 complying with BS 417-2 with modified connection on the side to take G2 pipe complying with BS 21, with other connections for vacuum line, pressure gauge and drain valve (if fitted).

F.1.4 *A calibrated pressure gauge* (marked (d) on Figure 9), to measure absolute pressures from 0 bar to 1.0 bar.

F.1.5 *A* 50 mm *full way quick action valve* (marked (e) on Figure 9).

F.1.6 *A water trap* with catchpot and drain valve (marked (f) on Figure 9).

F.1.7 *Pipework* (marked (g) on Figure 9), of 50 mm nominal bore and not exceeding 2 m in the total length connecting the vacuum vessel, full way quick action valve, water trap and connecting pipe to the float operated valve under test.

F.1.8 *A* 15 mm *copper pipe* (marked (h) on Figure 9), complying with Table X of BS 2871-1:1971, no longer than 200 mm in length, connecting the float operated valve under test to the 50 mm nominal bore pipework (see **F.1.7**).

F.1.9 *A cistern* complying with BS 1125 (side or bottom entry) with the warning pipe stoppered (marked (j) on Figure 9).

F.1.10 *A water supply.*

F.1.11 *A length of* 0.75 mm *nominal diameter nylon thread.*

F.2 Procedure

F.2.1 Foul the waterway of the float operated valve under test, over the whole passage from inlet shank to discharge arrangement outlet, by inserting the nylon thread (**F.1.11**).

F.2.2 Install the float operated valve complete with its float in the cistern (**F.1.9**).

F.2.3 Connect the float operated valve to the pipework and associated equipment as shown in Figure 9 ensuring that no residual water is present within the system.

F.2.4 Set the float so as to produce the maximum water level when the float operated valve shuts off. Run water into the cistern until the water level is at the datum level for backflow prevention test purposes (see **2.3**).

F.2.5 Close the full way quick action valve (**F.1.5**) and the water trap drainage valve (**F.1.6**) and open the fullway gate valve (**F.1.2**).

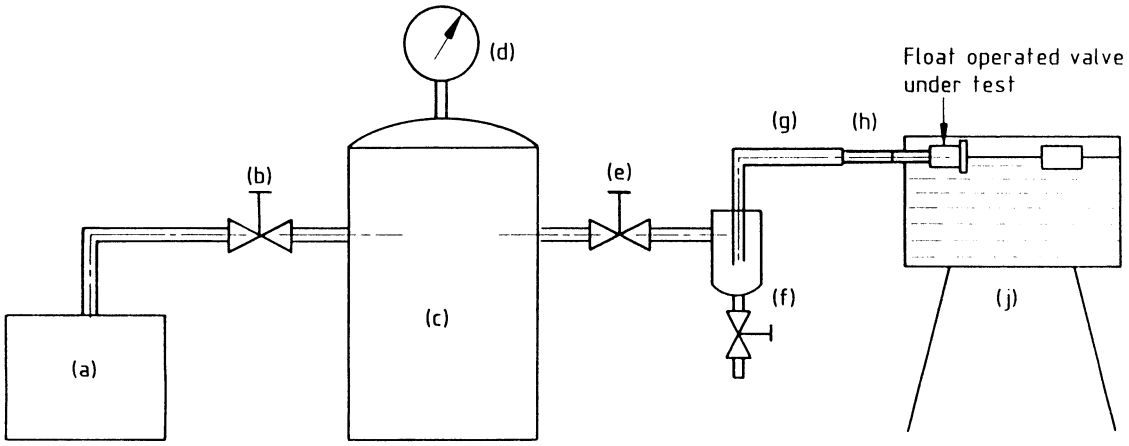
F.2.6 Activate the means of producing a vacuum until the gauge reading (**F.1.4**) on the vacuum vessel (**F.1.3**) is not more than 0.2 bar absolute. Close the fullway gate valve.

F.2.7 Quickly open the fullway quick action valve and allow it to remain open for 60 s. Close the fullway quick action valve.

F.2.8 Open the water trap drain valve to ascertain if any water was present in the catchpot (see clause **15**).

F.2.9 Lower the water level in the cistern to 20 mm below the datum level for backflow test purposes and repeat the procedures described in **F.2.5** to **F.2.8** inclusive.

F.2.10 Repeat **F.2.9** at 20 mm intervals of level until the water level is at least 20 mm below the lowest point of the discharge arrangement or the cistern is empty.



Key

(a) Vacuum pump (see **F.1.1**)

(b) 50 mm full way gate valve (see **F.1.2**)

(c) Vacuum vessel (see **F.1.3**)

(d) Pressure gauge (see **F.1.4**)

(e) 50 mm full way quick action valve (see **F.1.5**)

(f) Water trap with catchpot and drain valve (see **F.1.6**)

(g) 50 mm pipework (see **F.1.7**)

(h) 15 mm copper pipe (see **F.1.8**)

(j) A cistern (see **F.1.9**)

Figure 9 — Typical arrangement of apparatus for backflow prevention test

Appendix G Flow test

G.1 Low pressure seat test

G.1.1 *Apparatus*

G.1.1.1 *A test rig* (see (a) of Figure 10) capable of maintaining 1 ± 0.1 m head of water at the seat of the valve under test, comprising a cistern connected, through 15 mm copper pipework (in accordance with **F.1.8**) to the specimen valve via a controlling gate valve.

G.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 Figure 10) for a period of 140 ± 5 s whilst maintaining, for the duration of the test the water level in cistern A at a height of 1 ± 0.1 m above the centre of the inlet of the valve.

G.1.3 *Result*

Record the amount of water in container B.

G.2 High pressure seat test

G.2.1 *Apparatus*

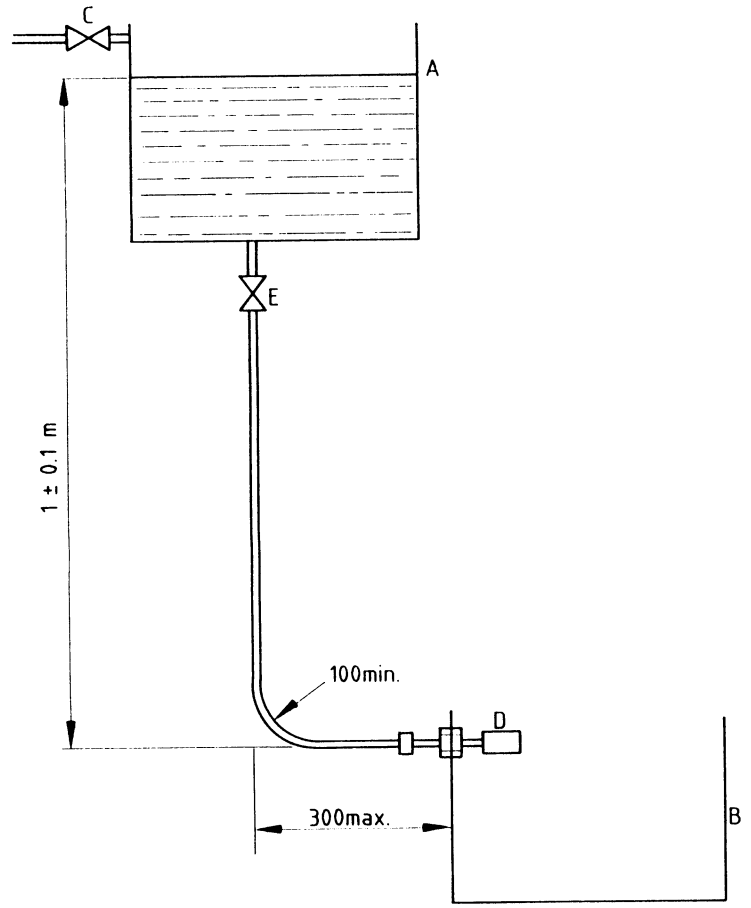
G.2.1.1 *A test rig* (see (b) of Figure 10) capable of maintaining a constant pressure of 3 ± 0.1 bar at the inlet of the valve under test, connected through 15 mm copper pipework in accordance with **F.1.8** to the specimen valve via a controlling gate valve.

G.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 ± 5 s whilst maintaining, for the duration of the test, the constant pressure of 3 ± 0.1 bar at the seat.

G.3 Result

Record the amount of water in container B.



Key

A Cistern

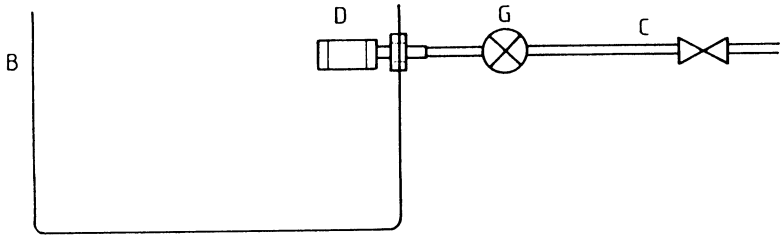
B Water container

C Stop valve capable of maintaining level at 1 m

D Fitting under test

E Gate valve complying with BS 5154

(a) Typical diagram of low pressure seat minimum flow test apparatus



Key

B Water container

C Gate valve complying with BS 5154

D Fitting under test

G Pressure regulating valve set at 3 bar

(b) Typical high pressure seat minimum flow test apparatus

All dimensions are in millimetres unless otherwise stated.

Figure 10 — Flow test apparatus

Appendix H Endurance test

H.1 Apparatus

H.1.1 *Test equipment,* capable of operating the float arm or float arm assembly to open fully and to close fully the valve on an automatic cycle.

H.1.2 *A water supply to the valve,* to be maintained at 1 ± 0.1 m head, and the water temperature not to exceed 30 °C.

H.1.3 *A closure force,* equivalent to 4.4 ± 0.1 N, applied at the end of the float arm or float arm assembly.

H.2 Procedure

H.2.1 Install the valve onto the test rig.

H.2.2 Fully open the valve in not less than 1 s.

H.2.3 Allow the valve to remain in the open position for a maximum of 2 s.

H.2.4 Fully close the valve in not less than 1 s.

H.2.5 Allow the valve to remain closed for a maximum of 2 s.

H.2.6 Carry out 200 000 cycles (the procedures described in **H.2.2** to **H.2.5** constitute one cycle of not less than 6 s duration).

H.3 Result

Record any evidence of component failure.

Publications referred to

BS 21, *Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions).*

BS 417, *Specification for galvanized low carbon steel cisterns, cistern lids, tanks and cylinder.*

BS 417-2, *Metric units.*

BS 864, *Capillary and compression tube fittings of copper and copper alloy.*

BS 864-2, *Specification for capillary and compression fittings for copper tubes.*

BS 970, *Specification for wrought steels for mechanical and allied engineering purposes.*

BS 970-1, *General inspection and testing procedures and specific requirements for carbon, carbon manganese, alloy and stainless steel.*

BS 970-4, *Valve steels.*

BS 1125, *Specification for WC flushing cisterns (including dual flush cisterns and flush pipes).*

BS 1134, *Assessment of surface texture.*

BS 2456, *Specification for floats (plastics) for ballvalves for hot and cold water.*

BS 2779, *Specification for pipe threads for tubes and fittings where pressure-tight joints are not made on the threads (metric dimensions).*

BS 2871, *Specification for copper and copper alloys. Tubes.*

BS 2871-1, *Copper tubes for water, gas and sanitation.*

BS 2872, *Specification for copper and copper alloy forging stock and forgings.*

BS 2873, *Specification for copper and copper alloys. Wire.*

BS 2874, *Specification for copper and copper alloy rod and sections (other than forging stock).*

BS 4118, *Glossary of sanitation terms.*

BS 5154, *Specification for copper alloy globe, globe stop and check, check and gate valves.*

BS 6920, *Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water.*

BS 6920-1, *Specification.*

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