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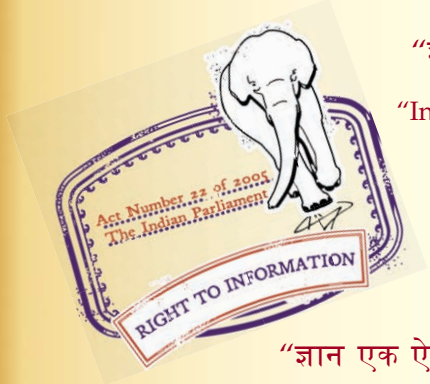

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IS 9739 : 1981
Reaffirmed 2007

Indian Standard

SPECIFICATION FOR PRESSURE REDUCING VALVES FOR DOMESTIC WATER SUPPLY SYSTEMS

(Second Reprint SEPTEMBER 1996)

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SPECIFICATION FOR PRESSURE REDUCING VALVES FOR DOMESTIC WATER SUPPLY SYSTEMS

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(*Continued on page* 11)

AMENDMENT NO. 2 MARCH 1990
TO
IS : 9739 - 1981 SPECIFICATION FOR PRESSURE REDUCING VALVES FOR DOMESTIC WATER SUPPLY SYSTEMS

(*Page* 9, *Fig.* 3) — Substitute the figure given on page 2 for the existing figure.

(*Page* 9, *clause* **6.5.1**, *line* 6) — Substitute '9·227 4 MPa' *for* '0·227 4 MPa'.

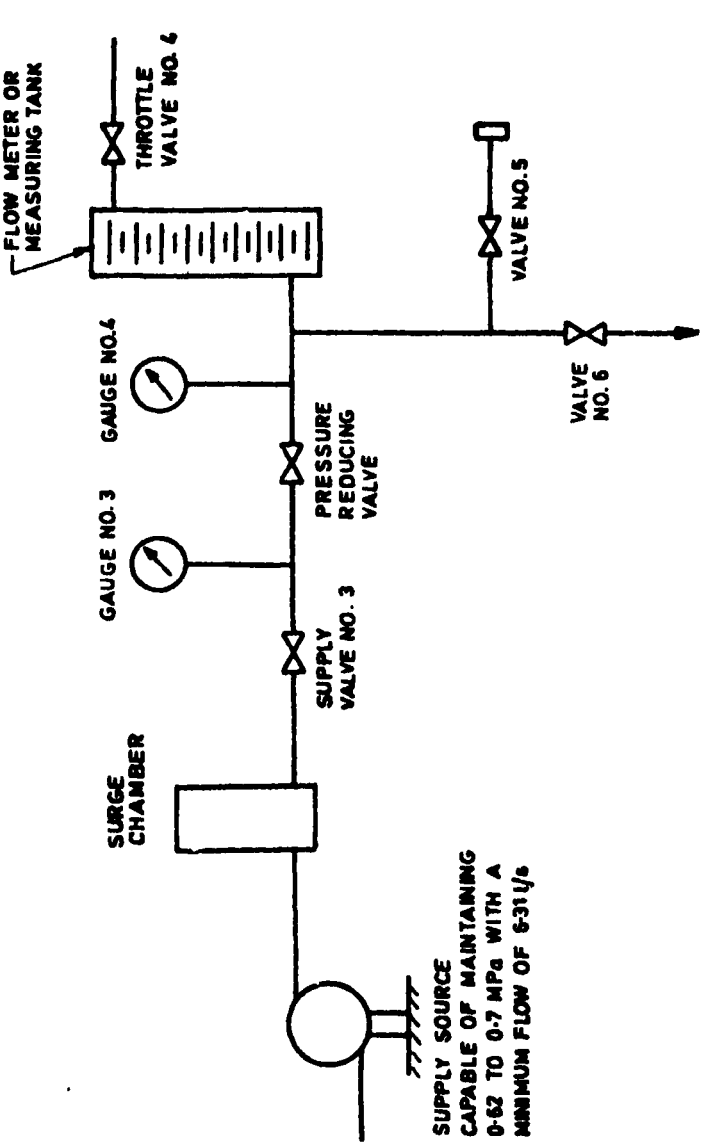

FIG. 3 TYPICAL PRESSURE REDUCING VALVE TESTING SET-UP

(BDC 3)

Printed at New India Printing Press, Khurja, India

Indian Standard

SPECIFICATION FOR PRESSURE REDUCING VALVES FOR DOMESTIC WATER SUPPLY SYSTEMS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 January 1981, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Normally a fluid, like water, builds up pressure when it is stored at an elevation or is taken from lines which are connected to motivation pumps. In many applications fluids at such high pressure cannot be utilized directly as they may damage other equipment connected to the line. For these reasons pressure reducing valves are installed on the fluid line to reduce and also to evaluate the fluid pressure in the most economical and simple way. This standard has been prepared with a view to providing guidance to the manufacturers and the users as to the requirements of pressure reducing valves of different sizes.

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

---

1. SCOPE

1.1 This standard lays down the requirements regarding material, construction and workmanship, performance and marking of pressure reducing valves of different sizes for domestic water supply system suitable for maximum inlet pressure of 1·722 5 MPa.

1.2 The valves covered by this standard are self-contained, direct acting, single seat, diaphgram type. Valves with integral or separate strainers connected to the valve inlet are included.

---

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

2. NOMINAL SIZES

2.1 The pressure reducing valves shall be of the following nominal sizes:

15 mm (1/2), 20 mm (3/4), 25 mm (1), 32 mm (1¼), 40 mm (1½) and 50 mm (2).

NOTE — The figures within the brackets refer to the sizes and designations of the threaded end as per IS : 554-1975*.

2.2 Nominal size of the valve shall be designated by the nominal bore of the pipe to which the valve is fitted.

3. MATERIALS

3.1 The different components of pressure reducing valves shall be made of the materials as given in Table 1.

3.2 Bodies of separate strainers may be of cast iron conforming to Grade FG 200 of IS : 210-1978†.

4. CONSTRUCTION AND WORKMANSHIP

4.1 All castings shall be sound, free from laps, blow holes and other surface defects.

4.2 Body and components shall be so designed as to provide ample resistance to distortion under maximum working pressure.

4.3 The valves shall have screwed female ends threaded to IS : 554-1975* for connection to the pipe line (*see* **2.1**). The ends shall be made hexagonal or of any other suitable design to facilitate wrenching. A typical sketch of pressure reducing valve is shown in Fig. 1.

4.4 The pressure adjusting shall be effected by a diaphragm loaded with a spring.

4.5 The seat may be integral with the body or it may have replaceable ring.

4.6 The design of the valve shall be such that in case of failure of any part of the valve, it shall be capable of maintaining a continuous flow of water to the system.

4.7 All valves shall be so constructed and installed as to permit repair or removal of parts without breaking a pipeline or removing the valve from the pipeline.

---

*Dimensions for pipe threads where pressure tight joints are required on the threads (*second revision*).

†Specification for grey iron castings (*third revision*).

TABLE 1 MATERIALS FOR COMPONENTS OF PRESSURE REDUCING VALVES

(*Clause* 3.1)

Sl No.	Component	Material	Indian Standard
i)	Body, Disc holder, Bottom cover, Drain plug, Diaphragm retaining disc, Spring discs and Check nut	Leaded-tin bronze	Grade 2 of IS : 318-1962*
ii)	Diaphragm cover and spring chamber	Cast iron	Grade FG 200 of IS : 210-1978†
iii)	Body seat ring (when replaceable), adjusting screw and valve stem	Chromium steel	Grade 12 Cr 13 of IS : 1570 (Part V)-1972‡
iv)	Tommy bar	Mild steel	IS : 226-1975§
v)	Diaphragm and valve disc	Synthetic rubber	—
vi)	Gaskets	Compressed asbestos fibre	Grade C of IS : 2712-1979‖
vii)	Fasteners	Steel	IS : 1363-1967¶
viii)	Springs	Carbon steel	IS : 4454 (Part I)-1975**
ix)	Strainer screen	Stainless steel	Designation 04Cr18 Ni 10, 07Cr18 Ni9, 10Cr17 Ni7, or 10Cr17 Mn6 Ni4 N20 of IS : 6911-1972††

*Specification for leaded tin bronze ingots and castings (*revised*).
†Specification for grey iron castings (*third revision*).
‡Schedules for wrought steels: Part V Stainless and heat-resisting steels (*first revision*).
§Specification for structural steel (standard quality) (*fifth revision*).
‖Specification for compressed asbestos fibre jointings (*second revision*).
¶Specification for black hexagon bolts, nuts and lock nuts (diameter 6 to 39 mm) and black hexagon screws (diameter 6 to 24 mm) (*first revision*).
**Specification for steel wires for cold formed springs: Part I Patented and cold drawn steel wires — unalloyed (*first revision*).
††Specification for stainless steel plate, sheet and strip.

4.8 Valves shall be so constructed that in normal service they will not chatter, pulsate, hum or be otherwise noisy.

4.9 The screen of the strainer shall have a minimum unobstructed open flow area (total area of holes) equal to or greater than twice the nominal pipe flow area. The maximum hole dimension of the screen shall not exceed 1/12 of the valve orifice escape diameter.

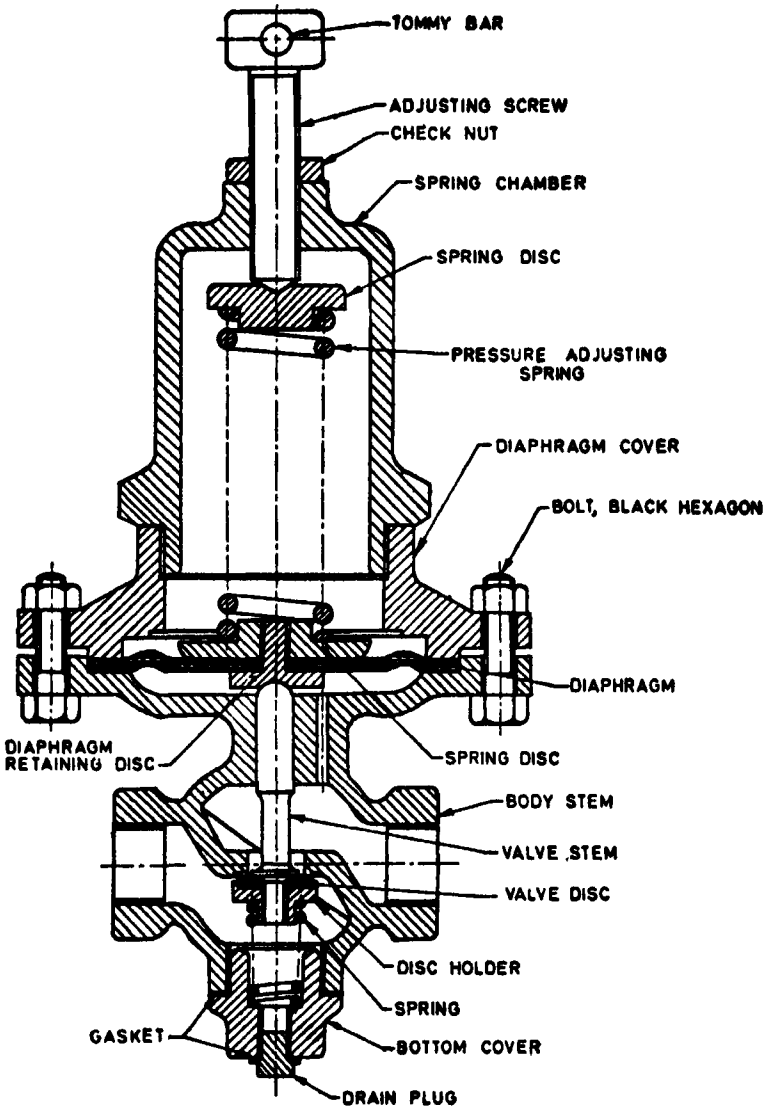

FIG. 1 TYPICAL SKETCH OF A PRESSURE REDUCING VALVE

5. PERFORMANCE REQUIREMENTS

5.1 Hydrostatic Test — When subjected to hydrostatic pressure of 1·722 5 MPa at its inlet and an equal back pressure on the reduced pressure side, there shall be no leakage or distortion of parts that will affect the performance of the valve.

5.2 Reduced Pressure Deviation — The reduced pressure delivered by the reducing valve shall not deviate by more than 0·007 MPa for every 0·07 MPa change in the inlet pressure.

5.3 Minimum Reduced Pressure — When water flows through a pressure reducing valve at the rate given in Table 2, with the inlet pressure being maintained at 1·722 5 MPa the valve shall be capable of adjustment to a reduced pressure as low as 0 1722 5 MPa.

TABLE 2 CAPACITIES OF PRESSURE REDUCING VALVES

Nominal Size (mm)	15	20	25	32	40	50
* Flow (l/s)	0·63	1·05	1·58	2·65	3·46	4·89

5.4 Reduced Pressure Adjustment Range — The reducing valve shall be provided with a reduced pressure adjustment range of not less than 0·172 25 MPa.

5.5 Capacity — The reducing valve shall have a minimum capacity as shown in Table 2 when maintaining a reduced pressure of 0·117 1 MPa less than its no-flow set pressure and the inlet pressure maintained at 0·344 5 MPa higher than the reduced point pressure.

6. TEST PROCEDURES

6.1 Hydrostatic Test

6.1.1 Turn the adjusting screw to remove all adjusting spring compression and install as in Fig. 2 with both globe valves No. 1 and 2 open, open the supply valve filling the system and purge it of air. Close valves No. 1 and 2, and raise the supply pressure to 1·722 5 MPa indicated by the Gauge No. 1. Observe and record pressure indicated by Gauge No. 2 which indicates the reduced pressure delivered by the reducing valve. Hold inlet pressure at 1·722 5 MPa for not less than five minutes. A continued rise in pressure indicated by Gauge No. 2 would indicate internal leakage or distortion of internal parts.

6.1.2 Open valve No. 1 allowing pressure on the reduced pressure side of the reducing valve to equalise at 1·722 5 MPa and hold for not less than five minutes. Observe for leaks or distortion of parts.

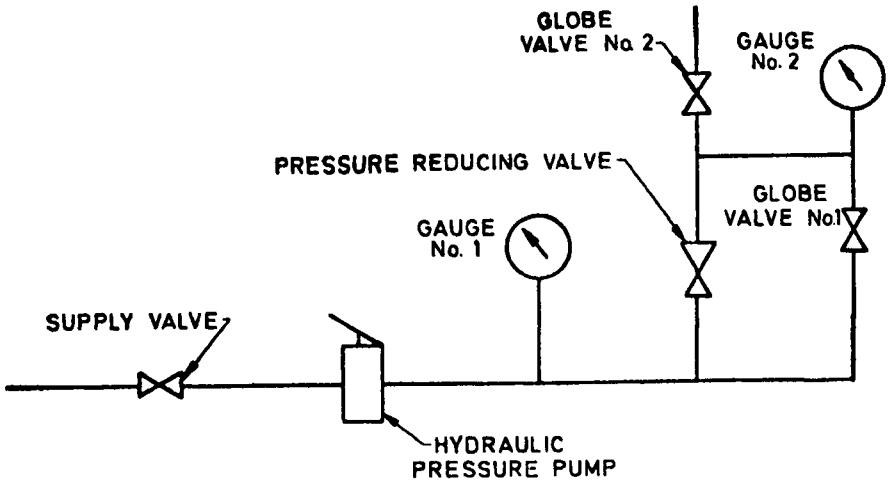

FIG. 2 TYPICAL ARRANGEMENT FOR HYDROSTATIC TEST

6.2 Test for Reduced Pressure Deviation

6.2.1 With the reducing valve installed as in Fig. 3, maintain 0·7 MPa inlet pressure. With valve No. 3 opened, the throttling valve No. 4 closed, and orifice valve No. 5 open bleeding through a 1·6 mm orifice, adjust the reducing valve to deliver a reduced pressure of 0·35 MPa indicated by Gauge No. 4. Increase the inlet pressure to 1·05 MPa and record the reduced pressure. Then lower the inlet pressure to 0·35 MPa and record the reduced pressure. The total reduced pressure deviation shall not exceed 0·07 MPa.

6.3 Test for Minimum Reduced Pressure

6.3.1 With the reducing valve installed as in Fig. 3, control the inlet pressure to 1·722 5 MPa and with the downstream valves No. 4 and 5 closed, open the throttling valve No. 6 slowly until the rate of flow conforms to that given in Table 2 for the size of valve on test, continuously adjusting the reducing valve to maintain a 0·1722 5 MPa reduced pressure and readjusting the throttling valve as necessary to maintain the required flow rate.

6.3.2 If the inlet pressure cannot be maintained at 1·722 5 MPa during the specified rate of flow, the reduced pressure may be adjusted to 0·007 MPa less than 0·172 25 MPa for every 0·07 MPa inlet pressure fall below 1·722 5 MPa.

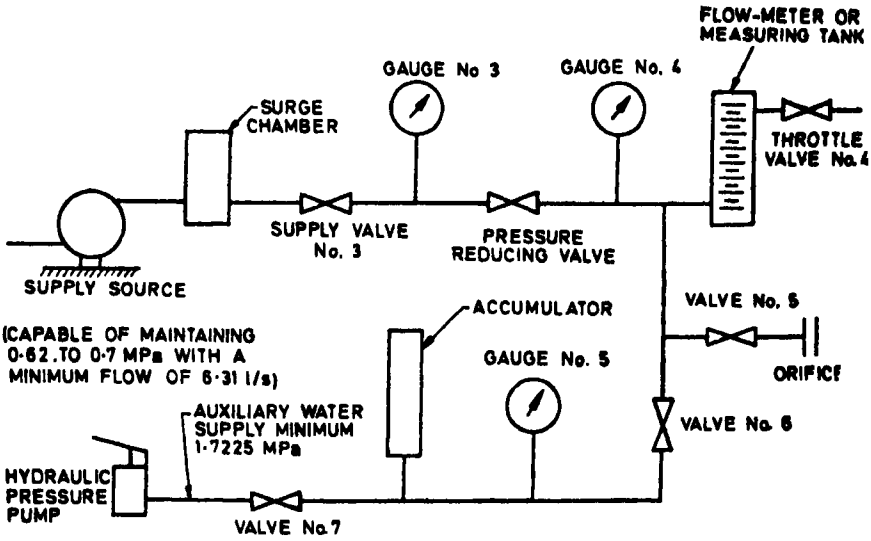

FIG. 3 TYPICAL PRESSURE REDUCING VALVE TESTING SET-UP

6.4 Test for Reduced Pressure Adjustment Range

6.4.1 With the reducing valve installed as in Fig. 3, maintain an inlet pressure of 0·7 MPa; close all downstream valves except valve No. 5 to the 1·6 mm orifice. The reduced pressure adjustment range shall meet the requirements given in **5.4**.

6.5 Capacity Test

6.5.1 Install the reducing valve in the system as shown in Fig. 3. Close all downstream valves except valve No. 5 in the line to the 1·6 mm orifice. Open valve No. 3 and regulate the initial pressure to a suitable pressure indicated by Gauge No. 3 which shall be maintained throughout the test. Adjust the reducing valve to maintain a set pressure of 0.227 4 MPa less than the initial pressure. Close valve No. 5 and slowly open the throttling valve No. 4 until the reduced pressure Gauge No. 4 is 0·117 1 MPa less than the set pressure and record the rate of flow through the reducing valve.

7. INSTRUCTIONS

7.1 Every pressure reducing valve shall be accompanied with instructions for installation, adjustment and maintenance.

8. MARKING

8.1 Every pressure reducing valve shall be permanently marked with the manufacturer's name or trade mark and nominal size.

8.1.1 Each pressure reducing valve may also be marked with the ISI Certification Mark.

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

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