1. SCOPE

This specification sets the minimum acceptable requirements for supply of multi-function pressure reducing, sustaining and flow limiting valves type for size range of DN80 up to DN1000mm.

2. APPLICABLE STANDARDS

EN 1074-1	Valves for water supply – Part 1: Fitness for purpose req. and Appropriate verification tests (General Req.)
EN 1074-5	Valves for water supply – Part 5: Fitness for purpose req. and Appropriate verification tests (Control valves.)
EN 12266-1	Testing of valves Part 1: Pressure tests, test procedures and acceptable criteria - Mandatory requirements – (Industrial valves)
ISO5752	Face to face dimensions of valves
ISO 7005	Metallic flanges
ISO5208	Industrial valves, Pressure testing of metallic valves
EN 1092	Flanges and their joints – Part 2: Cast Iron flanges, Circular flanges for pipes, valves, fittings and accessories, PN designated
EN1563/DIN 1693	Spheroidal graphite cast iron

1. General description

The valve shall be of the double flanged type, ductile cast iron. ***The pressure sustaining pilot*** shall maintain a minimum predetermined upstream pressure, when the actual upstream pressure meets the minimum allowable predetermined upstream pressure the valve will either open or modulate in order to maintain the minimum allowable upstream pressure. Operation shall be by the use of an integral auxiliary actuating mechanism (Pilot system) suitable for the application. The ***pressure reducing*** pilot shall automatically throttle to reduce a high incoming pressure to a lower constant downstream pressure regardless of variations in upstream pressure or flow rate, operation shall be by the use of an integral auxiliary actuating mechanism (Pilot system) suitable for the application. ***The flow control pilot*** maintains a constant flow rate by sensing the pressure differential across a specially sized orifice plate. The flow rate is adjustable by changing the pilot's setting (differential across orifice). When the pressure differential is less than the set point, the valve opens allowing flow to meet predetermined demand. When the pressure drop across the orifice exceeds the set point, the valve closes slightly, limiting flow to the pre-set maximum.

2. Flange Drilling

Flanges shall be designed to comply with ISO 7005 and BSEN 1092-2. Flange drilling shall be PN10 or PN16 according to project requirement.

3. Sizing

Valves shall be adequately sized to control the flow and pressure differential required for the application, with an accuracy of 5% of the set value. Valves shall be sized to ensure that their full capacity will be more than adequate to accept the desired maximum flow at the minimum required differential pressure.

4. Body description diaphragm valve types

Valves shall be a hydraulically operated diaphragm actuated globe valve. The valve is operated by introducing or releasing water from the control chamber above the diaphragm. The inner valve assembly shall be top and bottom guided by means of easily replaceable bearing bushings. The inner valve assembly shall be the only moving part and shall be securely mounted on a stainless steel stem.

Valves shall provide smooth motion with actuation being achieved by the use of an EPDM or NBR diaphragm. They shall be constructed of nylon or wool fabric bonded with synthetic rubber. The diaphragms shall not be used as a seating surface.

The valves shall form a drip tight seal between the stationary stainless steel body seat ring and the resilient disc seal, which is retained in the disc by clamping. The resilient disc shall be constructed of Buna or EPDM for normal service conditions.

All repairs and maintenance shall be possible without removing the valve from the line. To facilitate easy removal and replacement of the inner valve assembly and to reduce unnecessary wear on the guide, the stem shall be vertical when the valve is mounted in a horizontal line.

5. Pilot system

The pilot valve, controlling operation of the main valve, shall have a range of adjustment, be easily accessible, and arranged to allow for easy removal from the main valve while the main valve is under pressure. The pilots shall be of stainless steel construction with a spring to adjust the pressure setting. The diaphragm of the pilot shall be constructed of nylon or wool fabric bonded with synthetic rubber and shall not be used as a seating surface.

A needle valve(s) shall be incorporated in the connection from the pilot system to the main valve to adjust the rate of valve closure. Where required a second needle valve can be added to control the rate of opening of the main valve.

The pilot seat, stem and inner valve shall be of stainless steel construction and the inner valve shall have EPDM resilient compound for seating.

6. Hydrostatic Testing

Hydrostatic test of automatic control valve shall be performed on the completely assembled valve and are being tested in four tests:

- Shell Pressure Test.
- Seat Pressure Test.
- Diaphragm or Piston Sealing Test.
- Pilot System Test.

Standard testing is according to ISO5208. Shell test is 1.5times the working pressure, seal test is 1.1times of the working pressure.

7. Coating

All valves shall be internally and externally Epoxy coated to a minimum DFT of 250microns after careful surface preparation. Internal epoxy coating shall be of non-toxic type.

8. Materials of Construction

Valve body, Bonnet and disc shall be constructed of ductile iron castings that conform to ISO1083 Grade500-7 or equivalent.

Internal Stainless Steel components (stem and seating faces) shall conform to BS304S15, ASTM276-1967 Grade304 or 316.

Diaphragm shall be constructed of nylon or wool fabric bonded with synthetic rubber.

9- Marking

Marking shall be cast on the body with raised letters or engraved on a separate stainless steel name plate and it may indicates the nominal valve size, manufacturer’s name, design pressure rating and the year of manufacture.