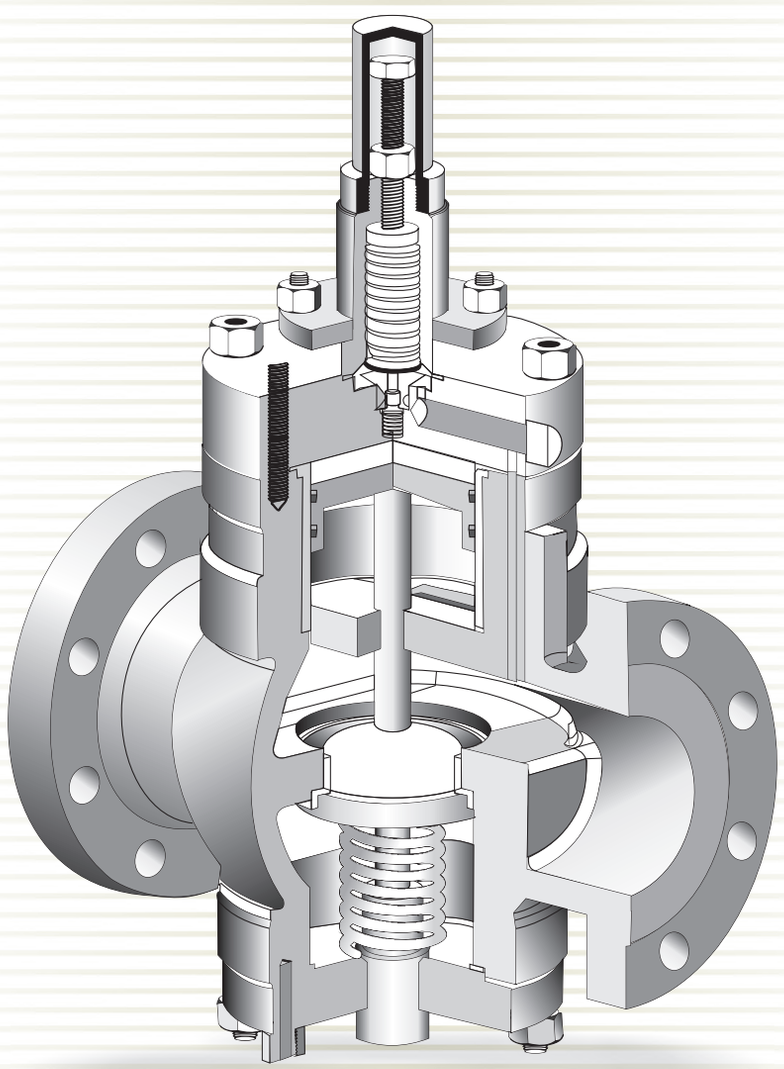
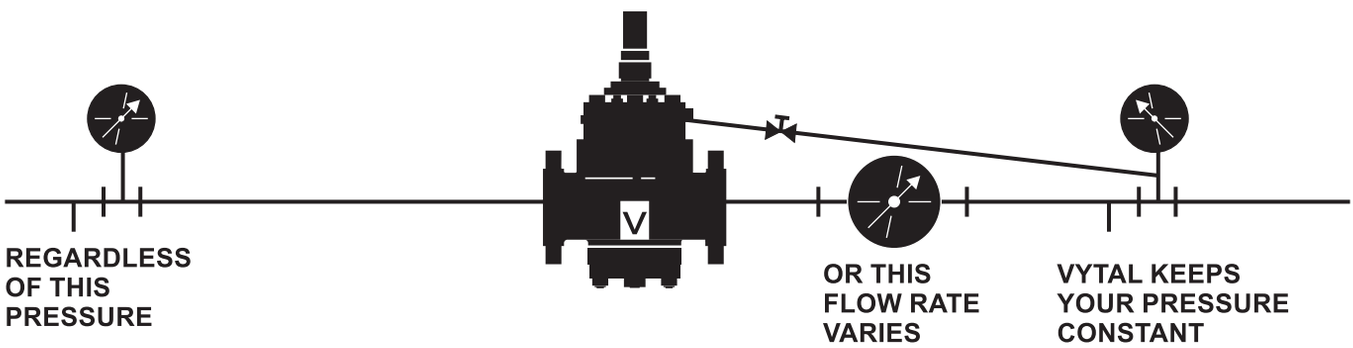
FULL LIFT REDUCING VALVES



PILOT OPERATED FOR ACCURACY OF CONTROL

Full Lift Reducing Valves



For High Performance on Steam, Air, Gases & Liquids

Self-actuating, Pilot-operated for enhanced accuracy.

Constant outlet pressure is maintained right up to the maximum rated capacity of the valve, and is unaffected by changes in the flow rate or in inlet pressure.

Balance design unaffected by changes in inlet pressure.

Responds instantly to changes in demand.

Very high flow rates can be achieved due to the full lift capability of the main valve.

Single seat design for control at low flow.

Interchangeability of the pilot valve component parts simplifies maintenance and allows for greater flexibility of spares stock.

A pressure rise of approximately 1% to“deadend”.

Reduced pressure accuracy ±1% from full flow to 10% of flow (10 to 1 turndown).

Increased seat/chest ratio for lower velocities and quieter operation.

No external power source, no down time due to loss of air, electricity, etc.

THE COMPACT "MARK ONE" REDUCING VALVE OFFERS YOUR GREATER PERFORMANCE AT A COMPETITIVE PRICE.

Built-In Extra Features

Featuring a compact efficient design the "Mark One" valve provides greater flow capacity and performance than most comparable models, yet is economically priced. Special features range from a streamlined body that minimizes turbulence and pressure drop to erosion-resistant, hardened stainless steel trim.

Positive Dead-End Shutoff

In the "Mark One" design, all main valves are single seated and normally closed. Initial pressure exerted on the main valve plug, assisted by a main spring, forces tight closing. Special valves equipped with cobalt based overlays on trim to maintain premium tightness - guaranteed not to be cut by high velocity flow.

Lower First Cost

Integrally mounted pilot saves installation and maintenance time eliminating conventional "hang-on" pilots. Easily installed, internal ports with fewer field connections reduces the number of joints - consequently reducing potential leak points.

Packless Construction

All main valves and pilots are built without stuffing boxes. This means more than just freedom from packing leaks and scoring, maintenance costs, and downtime because packless construction is a major contributor to the dynamic qualities. Packless construction eliminates leakage of gases to the atmosphere preventing costly loss.

Interchangeable Pilots

One of the great advantage of the "Mark One" design is the interchangeability of all Pilots on all sizes of main Valves. Furthermore, the function of any main valve may be changed simply by substituting one type of Pilot for another. e.g. the main valve may be converted from a pressure reducing valve to a back pressure regulator or a differential pressure regulator.

The practical advantage of interchangeable pilots is that a user of a number of Vytal Reducing Valves will find it very desirable to be able to convert the reducing valve from one service to another. The value and usefulness of "Mark One" is thereby greatly enhanced.

High Speed Response

"Mark One" valves are destined for high-speed operation. The downstream pressure is transmitted to the sensing diaphragm without delay, through a connection integral with the valve. This results in a feedback that is faster than any other possible method. Because of this and minimal inertia and travel of the moving parts, response time can be in the millisecond range.

High Stability

Long guiding surfaces are ground to high finish on all moving parts to assure true alignment and stability. High speed is of little advantage unless coupled with stability and here lies a subtle benefit of our "Mark One" that few have recognised.

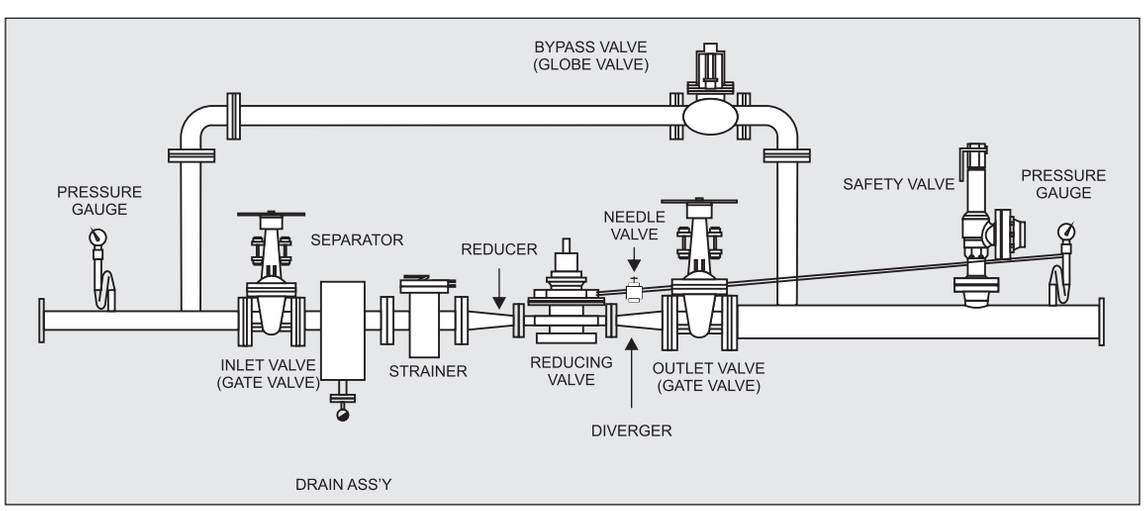
Interchangeable Adjusting Springs

Five adjusting springs cover reduced pressure of 0.35 Bar up to 22.5 Bar. The springs are designed to give best performance and are colour coded for error free selection. Set pressure ranges are changed by simply replacing the adjusting spring without removing the pilot assembly and without any special tools.

Adjusting spring ranges in Bar :

15mm to 100 mm Valve	Colour Code
0.35 - 3.0	Yellow
2.0 - 7.0	Blue
6.5 - 14.0	Red
12.5 - 20.0	Green
17.5 - 22.5	Black

For delivery pressures from 0.07 to 0.35 Bar a low pressure pilot top (LP) is required.



Valve Sizing

The table on page 6 lists the approximate flow co-efficients (Cv) for Vytal Reducing Valves. It is recommended that valve sizing is confirmed by Vytal. For this, the following minimum information is necessary.

- Fluid : Steam, Air, Gas
- Inlet Pressure
- Outlet Pressure
- Inlet Temperature
- Capacity : Maximum and Minimum

Reduced Capacity Trim

- In cases where it is more convenient, on account of the pipe connections, to have valve larger than is necessary to deal with the quantity of steam, we can fit smaller seats so that regulation will be satisfactory.

- To avoid replacing the valve body with another of a different size when a future increase in the flow is expected in relation to that at the start of operation.

- When the pressure drop across the valve is considerable, it is better to use a larger body for the advantage of rigidity.

Pressure and Temperature Ratings Body Materials

Cast Iron Body ASTM A 126 Grade B

A general purpose material for use on most non hazardous, applications suitable for use with steam air and gases.

Temperature Limits : -10 to +300°C

Maximum Pressure Cold Rating :
16 Bar (Air Gases and Liquids)

Maximum Pressure for Steam :
(to IBR) : 13 Bar @ 220°C

Carbon Steel Body ASTM A 216 Grade WCB

A commonly used material suitable for a wide range of fluids when corrosion and extremely low or high temperatures do not present a problem

Temperature Limits : -10 to +400°C.

Maximum Pressure Cold Rating :
46 Bar (Steam,Air, Gases and Liquids)

Maximum Pressure/Temp. Rating :
(to ASME/ANSI B16.34-1988)

Austenitic Stainless Steel ASTM A 351 Grade CF-8/8M

A very widely used Stainless Steel recognised for its excellent corrosion resistant properties in the presence of chlorides

Temperature Limits : -40 to +400°C.

Maximum Pressure Cold Rating :
42 Bar (Air Gases and Liquids)

Maximum Pressure/Temp. Rating :
(to ASME/ANSI B16.34-1988)

Vytal Operation

A relay or pilot-operated reducing valve for steam services is shown in Fig. 1. It comprises :
(i) The valve body which contains the main valve, the seat and the piston assembly.
(ii) The control head which houses the pilot valve assembly with its associated diaphragm and main adjusting spring.

In this type of reducing valve the main valve is opened by the action of inlet steam on top of the piston which is supplied via the inlet relay port and pilot valve. The pilot valve itself is controlled by the combined action of reduced pressure under the diaphragm and the adjusting spring above it.

The pilot valve opening (and hence the pressure on top of the piston) is controlled by the combined effect of reduced pressure acting on the underside of the diaphragm via the low pressure port, the pilot valve spring, and the load exerted on the top of the diaphragm by the adjusting spring. By this means, the slightest variation in reduced pressure affects the opening of the pilot valve and hence the pressure on top of the piston.

The main valve opening is this automatically adjusted by the reduced pressure which is accurately maintained despite variations of inlet pressure and/or capacity.

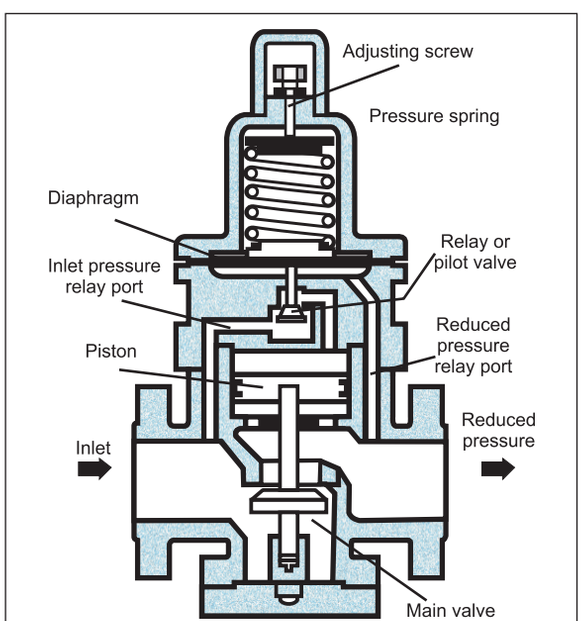
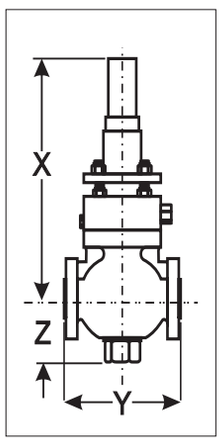
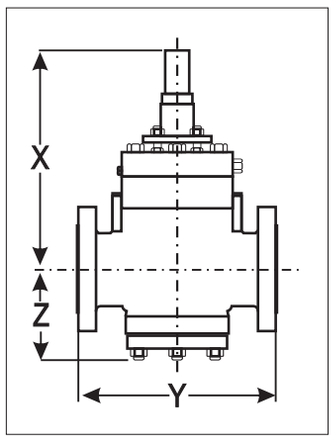


Fig.1: Relay operated reducing valve

Dimensions and Weights



Valve Size MM	X	Y	Z	Weights Kgs. Approx
*15	350	155	85	13
*20	350	155	85	13
*25	350	155	85	13
25	365	188	90	19
40	400	245	120	36
50	425	263	140	41
80	445	320	165	73
100	480	367	160	89

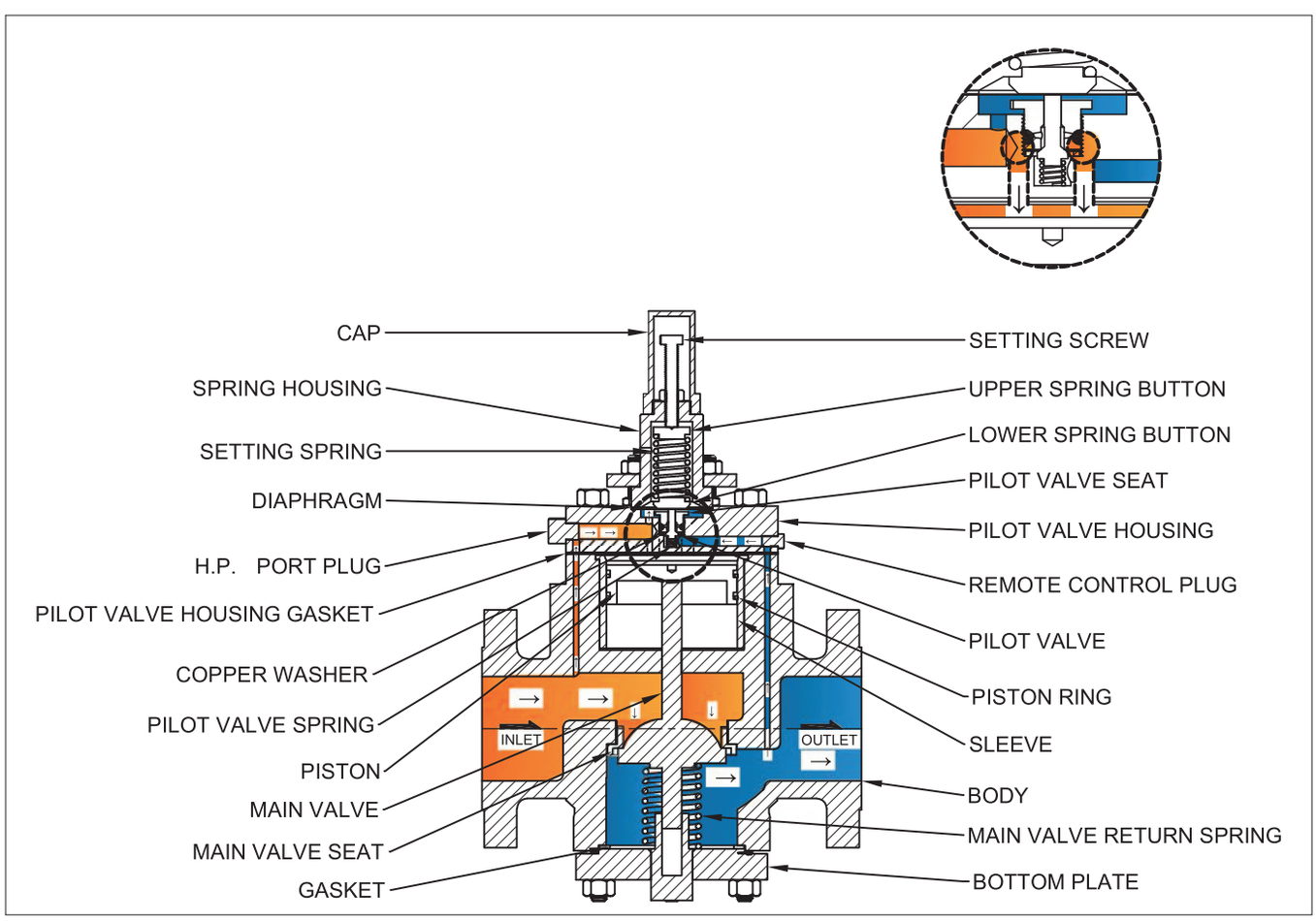


15mm to 25mm sizes have screwed connections

25mm to 100mm sized have flanged connections

NOTE :

- All dimensions are in mm and are to be used for estimation only. Certified drawings will be supplied upon request.
- "*"Denotes screwed connections. Standard screwed valve have B.S.P. (Parallel) threads but other threads can be supplied if required i.e. N.P.T., DIN, etc.
- Cast iron valve flanges to ANSI 150 Raised Face, Carbon/Stainless Steel Valve flanges to ANSI 300 Raised Face as standard. Other requirements available on request.



MATERIALS OF CONSTRUCTION

Part Name	Material	
Body	A 126 Gr B/ A 216 Gr WCB	A 351 Gr CF8 / 8M
Main Valve	A 276 Tp 410 (Hardened)	A 276 Tp 304/316
Main Valve Seat	A276 Tp 420 (Hardened)	A 276 Tp 304/316
Main Valve Return Spring	302 SS	302 SS
Piston	A 276 Tp 304	A 276 Tp 304/316
Sleeve	A 276 Tp 304	A 276 Tp 304/316
Piston Rings	Hard Chrome Iron	Hard Chrome Iron
Pilot Valve	A 276 Tp 304 (Stellited)	A 276 Tp 304/316 (Stellited)
Pilot Valve Seat	A 276 Tp 304 (Stellited)	A 276 Tp 304/316 (Stellited)
Pilot Valve Spring	302 SS	302 SS
Diaphragm	AISI 304 SS	AISI 304 SS
Adjusting Spring	Spring Steel Cadmium Plated	Spring Steel Cadmium Plated

Part Name	Material	
Pilot Valve Housing	A 108 Gr 1018	A 276 Tp 304/316
Spring Housing	A 126 Gr B/A 216 Gr WCB	A 351 Gr CF8/8M
Cap	A 126 Gr B/A 216 Gr WCB	A 351 Gr CF8/8M
Top Plate	A 126 Gr B/A 216 Gr WCB	A 351 Gr CF8/8M
Bottom Plate	A 126 Gr B/A 216 Gr WCB	A 351 Gr CF8/8M
Spring Button	A 108 Gr 1018	A 108 Gr 1018
Spring Adjusting Screw	A 276 Tp 304	A 276 Tp 304/316
HP Port Plug	A 108 Gr 1018	A 276 Tp 304/316
Remote Control Plug	A 108 Gr 1018	A 276 Tp 304/316
Jam Nut	A 276 Tp 304	A 276 Tp 304/316
Studs,	A 193 Gr B7	A 193 Gr B7
Nuts	A 194 Gr 2H	A 194 Gr 2H

Valve Size (mm)	15	20	25	40	50	80	100
Cv Standard	2.5	6	10	20	35	75	105
Special	1	3	5	10	15	35	50

Notes :

- Gaskets - Are graphite absestos material, for Air & Gases Rubber / PTFE as special on request.
- Main & Pilot Valves metal-to-metal seating for steam or with long-wearing resilient trim for bubble tight shut off on gases, minimises costly waste of industrial gases due to valve seat leakage.
- Special 304/316 st. steel or stellite faced st. steel on request.

VYTALVAL

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