VIRTUAL CATALOGUE

SAFETY VALVE VSI SERIES

- *HIGH FLOW COEFFICIENT*
- *ACTUATION BY EXCESS PRESSURE OR BY EXCESS AND LACK OF PRESSURE*
- *HIGH PRECISION AND RESPONSE RELIABILITY*
- *EASY TO INSTALL*
- *SIMPLE M AINTENANCE; NO NEED TO REMOVE FROM GAS LINE*
- *WIDE REGULATION RANGE*
- *BUILT-IN MANOMETER CLOSURE INDICATOR*
- *CAN BE SUPPLIED WITH ELECTRIC CONTACT, POSITION INDICATOR*
- *CONNETIONS: ANSI 150*
  PN25

VSI

VSM

APQ

VSI VS/M

Use

Due to their characteristics, VSI series safety valves are used with optimum results both in medium flow regulation stations and in industrial facilities where a fast response and reliable actuation are required. The function of these valves is to cut off the gas flow when the pressure at the measuring point doesn't reach or exceeds the pre-established minimum or maximum pressure values.
They can work with natural or manufactured gas, propane, air and other gases that do not contain a high percentage of benzol.

Construction characteristics

VSI series safety valves are composed of a spheroid cast iron body with a by-pass and response element that releases the plug.
Variations in entry pressure do not affect the accuracy of the safety valve's response. They contain a by-pass for resetting the safety valve without effort, even in the case of high pressure at the regulator inlet.
The valve can only be opened manually by pulling on the inverted top located at the lower end. This series of safety valves has been designed with easy, practical maintenance in mind and any element can be substituted without having to be removed from the gas line.
VSI/M series safety valves are ready for the assembly of a manometer valve or a 1/4" manometer, which will show if the VSI closure is perfect.
VSI/E series safety valves have a built-in electric Eex indicator.

Safety valve operations

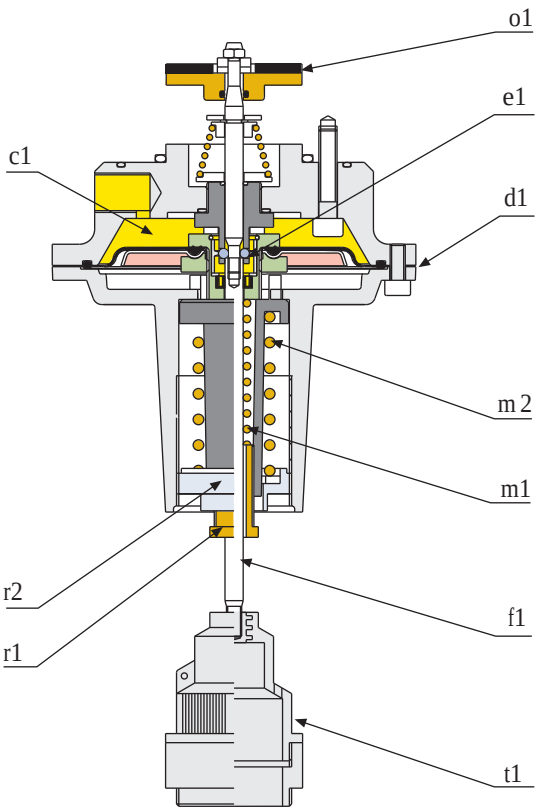
The pressure arrives at the chamber (c1) via the port and exercises a force on the membrane or diaphragm (d1), gradually moving it. This membrane also undergoes a counterforce exercised by the minimum (m1) and maximum (m2) calibration springs.
Under these balanced conditions, the spheres (e1) hold the shaft (f1) with the lock-up plug (o1) mounted at one end.
An increase or decrease in exit pressure exceeding the value tolerated by the moving parts makes the spheres move (e1), releasing the shaft (f1) and blocking the flow of gas by means of the plug (o1).

VERSIONS

Type	Standard	Manom.	Posit. Ind.
VSI 25	1		
VSI 25/M		1	
VSI 25/E		1	1
VSI 40	1		
VSI 40/S		1	
VSI 40/E		1	1
VSI 50	1		
VSI 50/S		1	
VSI 50/E		1	1

Safety adjustment limits

Type	Actuation pressure in mbar	
	By minimum	By maximum
BP	15 ÷ 100	40 ÷ 200
MP	50 ÷ 300	150 ÷ 500
AP	200 ÷ 2500	400 ÷ 5000



Setting up the safety valve

To reset the safety valve, remove the plastic top (t1) and, inverting it, screw it onto the end of the shaft (f1). Then pull slowly; checking that the gas passes through the valve and that the exit pressure rises slowly and reaches the entry pressure. Continue pulling until the end and, after checking that the safety valve is reset, unscrew the shaft top (t1) and, inverting it, screw it onto the top of the lock-up valve so that it will protect the safety valve controls.

Setting the safety valve

The safety valve is adjusted at the factory to the value indicated on the label of the valve itself and on the quality certificate. Should you wish to modify the value of the safety maximum or minimum, proceed as described below: If the safety valve has a minimum setting, you should always start with this. Turn the minimum dial (r1) clockwise to increase the minimum value and anti-clockwise to reduce it. If you wish to cancel the minimum, simply remove the minimum spring.
To set the safety maximum, turn the dial (r2) clockwise to increase the actuation value and anti-clockwise to reduce it. To cancel the safety maximum, turn the dial (r2) clockwise to a value where actuation would be illogical.

Choice of a safatey valve

The safety valve must be chosen in accordance with the flow required, taking into account for the calculation the necessary flow, the guaranteed minimum entry pressure and the exit pressure or load loss desired in the valve.

If $Ps > Pe$ use the formula:

$$Q = K \cdot Cg \cdot Pe \cdot \operatorname{sen}\left(\frac{3417}{C1} \cdot \sqrt{\frac{Pe - Ps}{Pe}}\right)^0$$

If $Ps \leqslant Pe$ use the formula:

$$Q = K \cdot Cg \cdot Pe$$

Where:
Q= Flow in Nm^3/h
Pe= Absolute entry pressure in bar
Ps= Absolute exit pressure in bar
Cg= Regulator coefficient (see table)
C1= Cg/Cv (see table)
K= 0.52 for natural gas, 0.31 for propane, 0.27 for butane and 0.39 for air or nitrogen.

FLOW COEFFICIENT

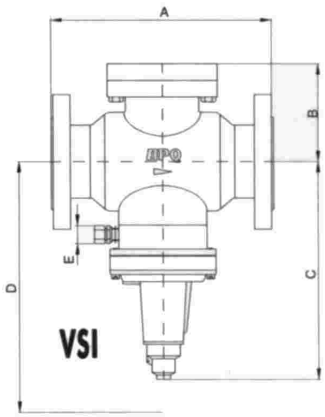
Type	Cg	C1
VSI 25	430	28
VSI 40	710	28
VSI 50	1120	28

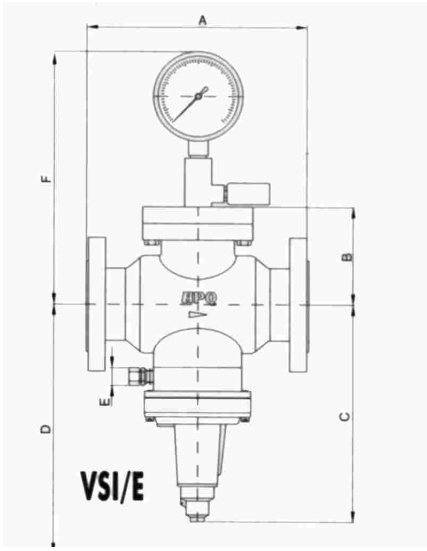
TECHNICAL CHARACTERISTICS

Body design pressure	20 bar
Actuator design pressure	20 bar
Maximum body entry pressure	20 bar
Maximum response element pressure	5 bar
Maximum response pressure	5 bar
Minimum response pressure	15 mbar
Maximum response accuracy AG	± 5 %
Minimum response accuracy AG	±15 %
Operational temperature	-10º ÷ + 50 ºC
Connections	Yokes ANSI 150

MATERIALS

Valve body	Spheroid cast iron
Valve top	Steel
Actuator body	Steel
Actuator top	Injected aluminium
Plug	Vulcanised brass
Valve Seat	Brass
Membrane BP series	Nitrile
Membrane MP-AP series	Woven nitrile
Joints	Nitrile
Shaft	Stainless steel





DIMENSIONS

Regulator Type	Connection Entry/Exit	A	B	C	D	E Ø	F	Weight
VSI 25	DN 25 or 150	184	84	220	230	8	-	7 Kg
VSI 25/E	DN 25 or 150	184	84	220	230	8	201	8 Kg
VSI 40	DN 40 or 150	223	108	240	250	8	-	12 Kg
VSI 40/E	DN 40 or 150	223	108	240	250	8	212	13 Kg
VSI 50	DN 50 or 150	254	124	250	260	8	-	18 Kg
VSI 50/E	DN 50 or 150	254	124	250	260	8	221	19 Kg

The measurements are in mm

INSTALLATION

a) Install in a gas line that is sufficiently strong to withstand the weight of the unit.
b) Assemble the safety valve following the arrow on the body of the valve itself.
c) Check that the port is at least 5 diameters from the outlet yoke.
d) Check that the gas entry speed and especially the exit speed do not exceed that requested or recommended by the gas company. In no case should the speed exceed 40 m/sec.
e) Ensure that the pipe has been cleaned of earth, sand, solder remains, etc.

The data contained in this catalogue may be modified without prior notice to ensure the ongoing improvement of the product.

APQ

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