Pietro Fiorentini

INDUSTRIAL VALVE SOLUTION

MIX FLOW

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VS/AM 58

Relief Valves

Classification and Application Fields

The **VS/AM 58** is a self actuated safety valve.

This valve is to be used in all applications where rapid opening and the reliable repositioning after closure are essential.

The **VS/AM 58** is designed for easy maintenance of its parts.
The **VS/AM 58** is available in a wide range of adjustment through hight precision set of spring.

- Compact design
- Easy maintenance
- Fast response time
- High precision
- Low operation costs

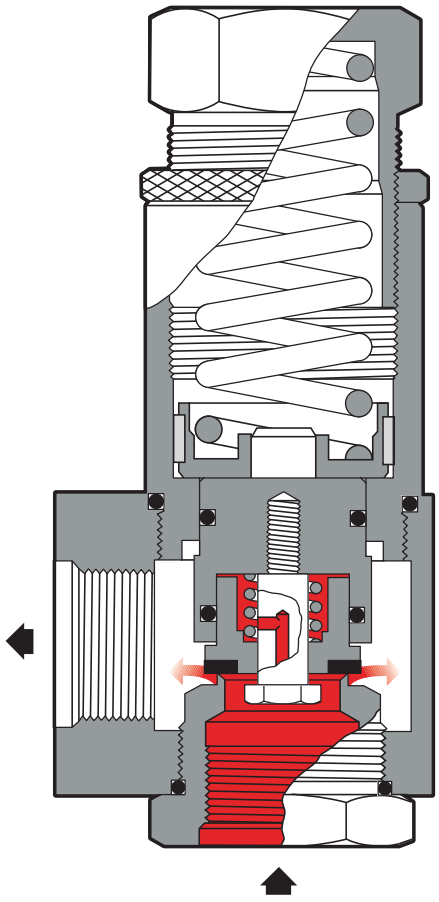

Fig.1 **VS/AM 58** - Basic version

Inlet pressure

FEATURES

Operating Features:*

Maximum inlet pressure:	100 bar
Opening start pressure:	±2%
Minimum environmental temperature:	Up to -20°C
Maximum environmental temperature:	Up to + 60°C
Inlet gas temperature:	Up to -20°C + 60°C

Construction Features:

Threaded connections:	1” RP ISO, 1” NPT
Flanged connections:	Class 150, 300, 600 according to EN1759-1

Materials: **

Body:	EN AW 6012-T651
Plug:	X8CrNiS18-9 EN10088-3 (Aisi303) + Nitril Rubber or Viton
Valve seat:	X8CrNiS18-9 EN10088-3 (Aisi303)

NOTA: * Different operating features available on request.
** The above materials refer to standard operations.
Different materials can be provided for specific needs.

Valve sizing

In general, the **VS/AM 58** valve is chosen based on the calculation of the flowrate determined using formulas and flow coefficients.

$$q = (0{,}9\ Kc) \bullet (394{,}9xc) \bullet P_1\ A \bullet \sqrt{\frac{M}{Z_1 \bullet T_1}} \qquad Q = 23.661\ \frac{q}{M}$$

Where:

q = maximum discharged flowrate [kg/h]
C = expansion coefficient
p_1 = calibration pressure (p_{sf}) più 10% in absolute bar (p_0 [bar abs] = p_{sf} [barg] • 1,1+1,013)
A = crossing minimum surface [mm^2] (see table 1)
Q = maximum flowrate [Stm^3/h]
M = molecular weight of fluid [kg/kmol] (see table 2)
Z_1 = compressibility factor of the fluid drain conditions (= 1 if unknown)
T_1 = temperature of fluid at valve inlet [K]
$k = \frac{Cp}{Cv}$ = isentropic equation coefficient
kc = discarged coefficient

$$C = 3.948 \bullet \sqrt{k \left(\frac{2}{k+1}\right)^{\frac{k+1}{k-1}}}$$

Calculation of the flow coefficient

Nominal diameter	
Millimetres	25
Inches	1”
Minimum diameter [mm]	23
Minimum passage area [mm^2]	415,48

tab. 1

Molecular weight and expansion coefficient

Tipologia di fluido	Molecular Mass (kg/kmol)	Expansion coefficient C
Carbon dioxide	44,01	2,637
Hydrogen	2,02	2,708
Methane	16,04	2,641
Natural gas*	18,04	2,641
Nitrogen	28,02	2,704
Oxygen	32,00	2,704
Propane	44,09	2,507

* Average value

Tab.2

Operating principle of the relief valve

These **VS/AM 58** safety devices operate on the principle of comparison between the thrust on the piston, deriving from the pressure of the gas to be controlled, and the thrust deriving from the setting spring.

Of course the weight of the mobile unit and the static and dynamic residual thrust on the cocked plug also influence the comparison.

When the thrust deriving from the gas pressure exceeds that of the spring, the plug is raised and a certain amount of gas is discharged; otherwise the plug is released and it closes the valve seat due to the sole effect of the pressure of the gas being controlled, not because of the setting spring.
This means that the cocked plug cannot be damaged by any wrong handling of the setting-adjustment nut.

Natural gas flow (d= 0,61) in Nm3 /h														
Setting in bar	Bubble bursting in bar	10	25	60	100	160	250	400	600	800	1000	2000	4000	5000
Overpressure in relation to setting in %														
2	2	8,5	13,5	19	19	19	25	38						
7	7	3	4,5	5,5	6	6	7	7	7,5	11	12			
14	14	2	4	5	6	6	6,5	6,5	7	7	7	10		
40	40	1	1	1,5	1,5	1,5	2	2	2	2	2	2	2	2

Tab.3

The table give the values of the discharge flow for various overpressures in relation to the setting and for some values of the setting itself. For intermediate values, the flow can be deduced by linear interpolation.

VS/AM 58

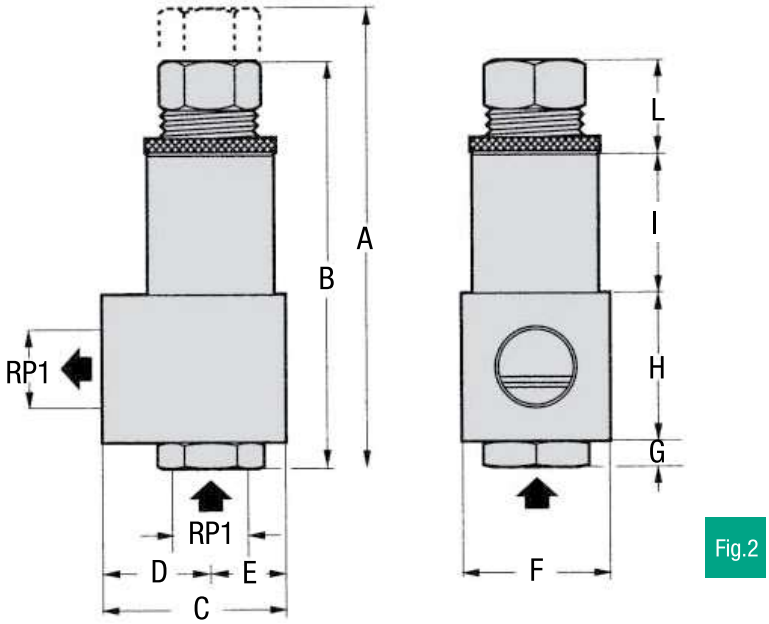

Fig.2

Dimensions [mm]	
Millimeters	25
Inches	1”
A	188
B	155
C	75
D	45
E	30
F	60
G	10
H	60
I	59
L	26

Tab.4

Weight [kg]	
Rp / NPT	1,9
Ansi 150	3,9
Ansi 300 / 600	5,6

Tab.5

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