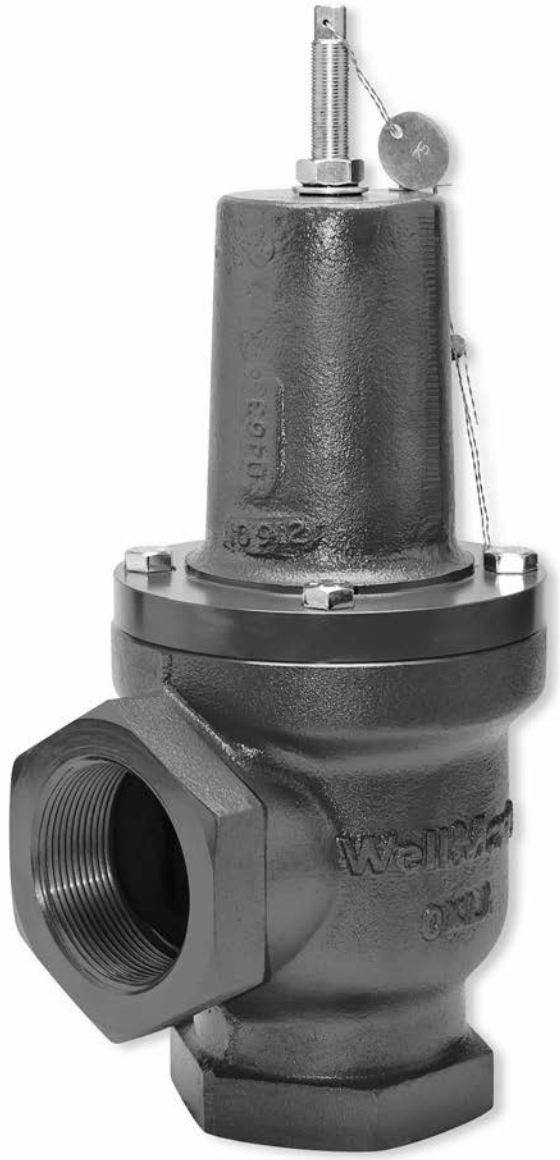
W9503 3" Threaded Safety Relief Valve

Application

These valves are for general purpose gas and air services, and are recommended for over-pressure protection on separators, compressors, pressure vessels, heater-treaters, gathering and transmission lines, meter runs, and other systems where the rated capacities of the valve are commensurate with the requirements of the system. All of these valves are manufactured in accordance with the ASME Boiler and Pressure Vessel Code and have been capacity tested and certified by the National Board to meet the requirements of Section VIII of the ASME Code, as signified accordingly by the symbols "UV" and "NB" on their nameplates.

NOTE: These valves are designed for relief to atmospheric pressure only on the downstream side, and are not intended for use in a closed system. Any backpressure applied to the downstream side of the valve will result in improper pressure relief.



Features

- Curtain - Disc Design: High Capacity - Low Blow Down
- ASME Coded: "UV" Section VIII Air/Gas
- Guided Lift System: Optimum Performance
- Trim: Soft Resilient Seat
- High Volume Applications
- Low Pressure Applications
- Stainless Steel Internals
- NACE Option Available

Specifications

90% Slope=36.12, 2.000 Orifice (3.142 Sq. In.)

Determining the Model Number

MODEL W9503-RS-125

- Size: W9503 • 3"
- Seat: RS • Soft Seat
- Option: N • NACE
- Spring Range: Use Max. psi Setting of Spring Range from Table.

Model Type, Pressure Settings & Range

Size	Model No.	SCFM*	Max PSI Setting	Pressure Range	Spring
W9503 3"	TYPE - 25	1542	25	15-25	05011-7233
	TYPE - 60	2806	60	26-60	05011-7241
	TYPE - 125	5497	125	61-125	05011-7258

*SCFM = For set pressures up to 75 psi
Pressure setting plus 3 psi plus atmospheric pressure (14.7 psi) times 90% slope
*SCFM = For set pressures over 75 psi
Pressure setting times 1.1 plus atmospheric pressure (14.7 psi) times 90% slope
Minimum ASME settings: 15 psi.

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Sizing of Safety Relief Valves

Given certain information as follows, Safety Relief Valves may be sized by use of various formulas prescribed by Appendix 11, Section VIII, Division I of the ASME Boiler and Pressure Vessel Code for capacities of orifices.

Table I — Value Data

Valve Size	Valve Type	Bore	KA	90% KA	Slope*	90% Slope
3"	W9503RS	2.000	2.188	1.969	40.12	36.12

* ASME certified slopes determined by actual tests conducted at the National Board Testing Laboratory, Columbus, Ohio.
NOTE: When sizing for code application, use 90% KA or 90% Slope.

Table II — Molecular Weight and Values of C for Gases

Gas	M	C
AIR	28.97	356
ACETYLENE	26.04	345
AMMONIA	17.03	351
BUTANE	58.12	324
CARBON DIOXIDE	44.01	345
CHLORINE	70.91	352
ETHANE	30.07	339
ETHYLENE	28.05	337
FREON 22	86.48	355
HYDROGEN	2.02	356
HYDROGEN SULFIDE	34.08	348
METHANE	16.04	346
METHYL CHLORIDE	50.48	337
NATURAL GAS (0.6)	17.40	344
NITROGEN	28.02	356
OXYGEN	32.00	356
PROPANE	44.09	331
SULFUR DIOXIDE	64.06	342

Parts List

Item	Description	Qty.	Part No.
1	VALVE BODY, DUCTILE IRON SA-395	1	05011-7191
2	SPRING HOUSING BONNET, DUCTILE IRON SA-395	1	05011-7274
3	SEAT, ASTM A-484 TY. 304	1	05012-7960
4	O-RING, VITON®	1	05000-1262
5	BLOW DOWN RING ASSY., ASTM A-484 TY. 304	1	06500-5132
6	O-RING, VITON®	1	05000-1288
7	HEX SCREW, SA-307 GR. A	4	05000-2013
8	SPRING GUIDE, ASTM A-108	1	05011-7266
9	ADJUSTMENT SCREW, SA-307 GR. B	1	05011-7282
10	JAM NUT, 304 S.S.	1	05000-2088
11*	SPRING 15-25 PSIG, 17-7 S.S.	1	05011-7233
	SPRING 26-60 PSIG, 17-7 S.S.	1	05011-7241
	SPRING 61-125 PSIG, 17-7 S.S.	1	05011-7258
12	NAME PLATE, ALUMINUM	1	10751
13	THREAD SEAL, STEEL/BUNA	1	10578

*Inconel® Optional

Dimensional Data

Model	A	B	C	D	E	F
W9503	4" MAX.	17 1/2"	4 5/8"	4 5/8"	3" FNPT	3" FNPT

Table III — Formulas

Q (SCFM) = Pressure Setting times 1.1 plus atmospheric pressure (14.7 psia) times 90% slope.

$$Q\ (SCFM) = \frac{KACP}{w \times 60}\sqrt{\frac{M}{T}}$$

$$W\ (lb/hr) = KACP\sqrt{\frac{M}{T}}$$

$$KA = \frac{Wa}{CP}\sqrt{\frac{T}{M}}$$

Where:

Q = Required flow (scfm) thru valve at 14.7 psia and 60°F
SCFM = Standard cubic feet per minute.
KA = Product of effective coefficient of discharge and the effective discharge area.
C = Coefficient determined by ratio of the specific heats of gas or vapor at standard conditions.
P = Set pressure x 1.1 plus atmospheric pressure (14 .7 psia)
w = Density of gas (lb./cu. ft.) at 60°F, and 14.7 psia (air being .0764 lb. cu. ft.)
M = Molecular weight
T = Absolute temperature at inlet (°F + 460)
W = Flow of any gas or vapor, lb./hr.
Wa = Rated capacity, converted to lb./hr. of air at 60°F, inlet temperature.