Ellem'S

SAFETY RELIEF VALVE

SERIES 3000

FLUID CONTROL VALVES & COMPONENTS

(A UNIT OF ELLEM ENGINEERING)

Sr.no.	Table of Content	Pg.no

PRESSURE RELIEF VALVES FCV SERIES 3000

General Information

FCV Works on its 26 years of pioneering effort to sustain leadership in the valve components marketplace. Owing to the vast experience in this field, we enjoy a remarkable reputation in the industry and are considered amongst the market leaders. These products are manufactured using advanced technology and latest machinery. Our product range includes various metal components and steel studs that find their application in various industries.

We adhere to stringent quality control measures in order to enable standardized output. Our remarkable reputation can be reflected in our impressive clientele. Our infrastructure is equipped with all the facilities and amenities that are required for a smooth production process, quality testing or research and development. We believe in effective and timely delivery of our products. Our clientele is dispersed across the globe due to our quality products.

Our Quality Policy

- To be a world class manufacturing production plant able produced highly quality components at affordable cost
- To deliver the other plants in India & abroad on time
- To produce high precision aluminium machined components to major customers in India
- To accelerate development of existing suppliers in order to improve profitability
- To accelerate cost reduction on key account customers.
- To build a strong industrial unit for larger productions at lower cost.

Introduction to Safety Relief Valves

Safety relief valves are critical components in pressure systems, designed to protect equipment, pipelines, and personnel from overpressure conditions. They function by automatically releasing excess pressure when it exceeds a predetermined limit, ensuring system integrity and safety.

These valves are widely used in industries such as oil & gas, chemical processing, power generation, and manufacturing, where pressure control is essential for safe operations.

Applications

FCV Safety Valves offer ultimate protection against unallowable overpressures in all applications for steam, gases and liquids where smaller capacities are required. Typical applications for FCV Safety Valves are:

- Air/Gas compressors and pumps
- Technical gases and CO_2 plants
- Thermal relief
- Cylinder filling stations
- Chemical equipment and piping
- Pressure vessels and piping systems containing gas, air, liquid or steam
- LPG / LNG terminals, carriers etc.
- Cryogenic systems and oxygen applications high pressure extraction plants

Standard	Title	Scope
ASME Section VIII, Division 1	Boiler and Pressure Vessel Code – Pressure Vessels	Design and installation rules for pressure vessels, including PRVs (UG-125 to UG-137).
ASME Section I	Power Boilers	Safety valve requirements for steam boiler systems.
ASME Section XIII	Rules for Overpressure Protection	Rules for pressure relief devices across pressure equipment.
API 526	Flanged Steel Pressure Relief Valves	Standard dimensions, orifice sizes, and ratings.
API 520 Part I	Sizing and Selection	Guidelines for sizing and selecting pressure-relieving devices.
API 520 Part II	Installation	Installation best practices for PRVs.
API 521	Pressure-Relieving and Depressuring Systems	System design to manage overpressure and depressurization.
ISO 4126 Series	Safety Devices for Protection Against Excessive Pressure	International series of standards covering design, testing, and application.

Ordering information

Please specify the following so that we may process your order as quickly as possible.

1. Quantity.
2. Inlet and outlet sizes.
3. Inlet and outlet connections: MNPT, FNPT, Flanged.
4. Materials of construction if other than standard.
5. Set pressure.
6. Operating and relieving temperatures.
7. Allowable overpressure.
8. Fluid and fluid state.
9. Backpressure, superimposed constant and/or variable, and built-up.
10. Required capacity.
11. Accessories: open or packed lever if required, test gag.
12. Code requirements, if any.

. *We verify your selection and sizing. In order to do this, we must have this information

Numbering system

Selecting and specifying FCV pressure relief valve is simple using the numbering system that follows. Each digit of the part number has a distinct significance. The digits describe the basic valve series, orifice, seat design, inlet temperature range, body, bonnet and spring material, inlet type pressure rating.

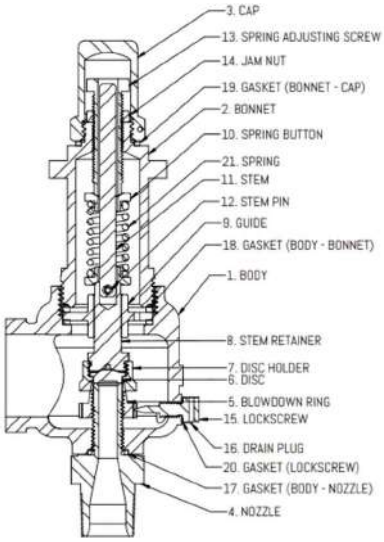
Model codification

Example: VALVE MODEL NUMBER: H3CMM1F2P00

H	3	C	M	M	1	F	2	P	0	0
SPECIAL VERIATIONS	SERIES	ORIFICE/ AREA	SEAT CONSTRUCTION	INLET CONNECTION	INLET SIZE	OUTLET CONNETCTION	OUTLET SIZE	CAP CONSTRUCTION	TEST GAG	SPECIAL MATERIAL
H –High pressure B – Balanced design	3000	C/0.068 D/0.125 E/0.23 F/0.350 G/0.573	M-METAL R-RESILIENT P-PTFE E-CUSTOMISED	M – MNPT F – FNPT P – BSP MALE T – BSP FEMALE B – BUTT WELD W – SOCKET WELD 1 – 150# 2 – 300# 3 – 600# 4 – 900# 5 – 1500# 6 – 2500# 7 – GRAYLOC	1 – 0.5" 2 – 0.75" 3 – 1.0" 4 – 1.5" 5 – 2.0"	M – MNPT F – FNPT P – BSP MALE T – BSP FEMALE B – BUTT WELD W – SOCKET WELD 1 – 150# 2 – 300# 3 – 600# 4 – 900# 5 – 1500# 6 – 2500# 7 – GRAYLOC	1 – 0.5" 2 – 0.75" 3 – 1.0" 4 – 1.5" 5 – 2.0" 6 – 2.5"	P-PLAIN C-PACKED LEVER L-OPEN LEVER	0-WITHOUT GAG 1-GAG	0-NO SPL. MAT. SS-COMPLETE STAINLESS ST. NW-NACE WETTED PARTS NA-NACE ALL ST.ST MW-MONEL WETTED PARTS MA-MONEL ALL HW-HASTOLLY WETTED PARTS HA-HASTELLOY ALL CW-INCONEL WETTED PARTS CA-INCONEL ALL

Note: any other customised requirement in material or constructions please contact our Team – sales@ellemengineering.com.

Material & Design



SL.NO.	PART NAME	MATERIAL
1	BODY	SA 216 GR.WCB
2	BONNET	SA 216 GR.WCB
3	CAP	SA 216 GR.WCB
4	NOZZLE	ASTM A 479 GR.316 SS
5	BLOWDOWN RING	ASTM A 479 GR.316 SS
6	DISC	ASTM A 479 GR.316 SS
7	DISC HOLDER	ASTM A 479 GR.316 SS
8	STEM RETAINER	ASTM A 479 GR.316 SS
9	GUIDE	ASTM A 479 GR.316 SS
10	SPRING BUTTON	ASTM A 479 GR.316 SS
11	STEM	ASTM A 479 GR.316 SS
12	STEM PIN	316 SS/416 SS
13	SPRING ADJUSTING SCREW	ASTM A 479 GR.316 SS
14	JAM NUT	ASTM A 479 GR.316 SS
15	LOCK SCREW	ASTM A 479 GR.316 SS
16	DRAIN PLUG	ASTM A105/416 SS
17	GASKET NOZZLE-BODY	ASTM A 240 GR.316 SS
18	GASKET BODY-BONNET	ASTM A 240 GR.316 SS
19	GASKET BONNET-CAP	ASTM A 240 GR.316 SS
20	GASKET LOCKSCREW	ASTM A 240 GR.316 SS
21	SPRING	316 SS

O-RING SELECTION

PRESSURE & TEMPRATURE LIMITS - O-RING SEAT VALVE

The series 3000 is available with an optional O-ring seat which minimizes fugitive emissions and costly product loss. This optional seat construction provides zero bubbles per minute leakage at 90% Of set pressure per API standard 527. The tables below list the set pressure and temperature range for both the elastomer and Teflon seat option.

Orifice	Pressure Range, PSIG		Pressure Range, BAR G	
	Elastomer Seat	Teflon Seat	Elastomer Seat	Teflon Seat
C High Pressure	15 to 1480 ----	800 to 2500 2501 to 5000	1.00 to 102 ___	55.1 to 172 172.1 to 345
D High Pressure	15 to 1480 ----	800 to 1600 1601 to 5000	1.00 to 102 ___	55.1 to 172 172.1 to 345
E	15 to 1480	600 to 2500	1.0 to 102	41.3 to 172
F	15 to 1480	600 to 1600	1.0 to 102	41.3 to 110
G	15 to 1000	200 to 1000	1.0 to 69	14 to 69

MATERIAL AVAILABILITY		
Material	Temperature Range[1]	
	ºF	ºC
Viton®	-20º to +450º	-29º to +232º
Buna N	-20º to +250º	-29º to +121º
EPR	0º to +350º	-18º to +177º
Silicone	-150º to +450º	-101º to +232º
Kalrez®	-20º to +550º	-29º to +289º
Teflon	-300º to +500º	-184º to +260º

U.S CUSTOMARY UNIT

THREADED CONNECTION: MNPT X FNPT

Orifice Area Sq. In.	Valve Size Inlet X Outlet	Type Number	Max. set pressure, PSIG -50°F to 750°F	Max. Back Pressure PSIG at 100°F	MATERIAL BODY / BONNET	MATERIAL SPRING
0.068	1/2 X 1 3/4 X 1 3/4 X 1 1 X 1 1 X 1	3CMM14P00 3CMM24P00 3CMHM24P00 3CMM34P00 3CMHM34P00	1600 2500 5000 2500 6500	400	CARBON STEEL	316 SS
0.125	1/2 X 1 3/4 X 1 3/4 X 1 1 X 1 1 X 1	3DMM14P00 3DMM24P00 3DMHM24P00 3DMM34P00 3DMHM34P00	1600 1600 5000 1600 5000	400	CARBON STEEL	316 SS
0.223	1 X 1 1/2	3EMM35P00	2500	400	CARBON STEEL	316 SS
0.350	1 1/2 X 2	3FMM46P00	1600	400	CARBON STEEL	316 SS
0.573	1 1/2 X 2 1/2	3GMM47P00	1000	400	CARBON STEEL	316 SS

FLANGED CONNECTIONS

Orifice Area Sq. In.	Valve Size Inlet x Outlet	ANSI Flange class		Type Number	Maximum set pressure, PSIG			Max. Back Pressure PSIG at 100°F	Materials	
		Inlet RF	Outlet RF		-50°F to 100°F	400°F	750°F		Body / bonnet	Spring
0.068	1/2 X 1	150#	150#	3CMH1411P00	285	200	95	285	Carbon Steel	316 SS
		300#	150#	3CMH1421P00	740	635	505	285		
		600#	150#	3CMH1431P00	1480	1270	1010	285		
		900#	300#	3CMH1442P00	2220	1900	1510	400		
		1500#	300#	3CMH1452P00	3705	3170	2520	400		
		2500#	300#	3CMH1462P00	5000	5000	4200	400		
	3/4 X 1	150#	150#	3CMH2411P00	285	200	95	285	Carbon Steel	316 SS
		300#	150#	3CMH2421P00	740	635	505	285		
		600#	150#	3CMH2431P00	1480	1270	1010	285		
		900#	300#	3CMH2442P00	2220	1900	1510	400		
		1500#	300#	3CMH2452P00	3705	3170	2520	400		
		2500#	300#	3CMH2462P00	5000	5000	4200	400		
	1 X 1	150#	150#	3CMH3411P00	285	200	95	285	Carbon Steel	316 SS
		300#	150#	3CMH3421P00	740	635	505	285		
		600#	150#	3CMH3431P00	1480	1270	1010	285		
		900#	300#	3CMH3442P00	2220	1900	1510	400		
		1500#	300#	3CMH3452P00	3705	3170	2520	400		
		2500#	300#	3CMH3462P00	6170	5280	4200	400		
0.125	1/2 X 1	150#	150#	3DMH1411P00	285	200	95	285	Carbon Steel	316 SS
		300#	150#	3DMH1421P00	740	635	505	285		
		600#	150#	3DMH1431P00	1480	1270	1010	285		
		900#	300#	3DMH1442P00	2220	1900	1510	400		
	3/4 X 1	150#	150#	3DMH2411P00	285	200	95	285	Carbon Steel	316 SS
		300#	150#	3DMH2421P00	740	635	505	285		
		600#	150#	3DMH2431P00	1480	1270	1010	285		
		900#	300#	3DMH2442P00	2220	1900	1510	400		
		1500#	300#	3DMH2452P00	3705	3170	2520	400		
		2500#	300#	3DMH2462P00	5000	5000	4200	400		
	1 X 1	150#	150#	3DMH3411P00	285	200	95	285	Carbon Steel	316 SS
		300#	150#	3DMH3421P00	740	635	505	285		
		600#	150#	3DMH3431P00	1480	1270	1010	285		
		900#	300#	3DMH3442P00	2220	1900	1510	400		
		1500#	300#	3DMH3452P00	3705	3170	2520	400		
		2500#	300#	3DMH3462P00	6170	5280	4200	400		
0.223	1 X 1 1/2	150#	150#	3EMH3511P00	285	200	95	285	Carbon Steel	316 SS
		300#	150#	3EMH3521P00	740	635	505	285		
		600#	150#	3EMH3531P00	1480	1270	1010	285		
		900#	300#	3EMH3542P00	2220	1900	1510	400		
0.350	1 1/2 X 2	150#	150#	3FMH4611P00	285	200	95	285	Carbon Steel	316 SS
		300#	150#	3FMH4621P00	740	635	505	285		
		600#	150#	3FMH4631P00	1480	1270	1010	285		
0.573	1 1/2 X 2 1/2	150#	150#	3GMH4711P00 3GMH4721P00 3GMH4731P00	285 740 1000	200 635 1000	95 505 1000	285 285 285	Carbon Steel	316 SS
		300#	150#							
		600#	150#							

Balance Design in Safety Relief Valves

Safety relief valves are crucial components in pressure systems, designed to protect equipment and personnel by releasing excess pressure. One key aspect of their design is balance, which ensures consistent and reliable operation under varying conditions. Balance design in safety relief valves refers to mechanisms that counteract pressure forces acting on the valve components, particularly the disk and spring. The goal is to maintain stability in valve performance, even with fluctuating backpressure or inlet pressure variations

Types of Balance Mechanisms in Relief Valves

a) Bellows-Balanced Relief Valves

- Utilizes a flexible bellows to counteract backpressure effects.
- Protects against external pressure fluctuations that could alter set pressure.
- Commonly used in systems with moderate to high backpressure.

b) Piston-Balanced Relief Valves

- Features a piston mechanism that equalizes pressure forces on both sides of the valve disk.
- Used in high-pressure applications requiring precise control.
- More resistant to mechanical wear compared to bellows designs

THREADED CONNECTION: MNPT X FNPT

Orifice Area Sq. In.	Valve Size Inlet X Outlet	Type Number	Maximum Set Pressure, PSIG	Max. Back Pressure PSIG at 100° F	Materials	
			-20° F to 450° F		Body / Bonnet	Spring
0.068	1/2 X 1 3/4 X 1 1 X 1	3CMM14P00B 3CMM24P00B 3CMM34P00B	1480	400	Carbon Steel	316 SS
0.125	1/2 X 1 3/4 X 1 1 X 1	3DMM14P00B 3DMM24P00B 3DMM34P00B	1480	400	Carbon Steel	316 SS

FLANGED CONNECTION

Orifice Area Sq. In.	Valve Size Inlet x Outlet	ANSI Flange class		Type Number	Maximum set pressure, PSIG		Max. Back Pressure PSIG at 100°F	Materials	
		Inlet RF	Outlet RF		-20°F to 100°F	400°F		Body / bonnet	Spring
0.068	1/2 X 1	150# 300# 600# 900#	150# 150# 150# 300#	3CMBH1411P00 3CMBH1421P00 3CMBH1431P00 3CMBH1442P00	285 740 1480 1480	200 635 1270 1270	285 285 285 400	Carbon Steel	316 SS
	3/4 X 1	150# 300# 600# 900#	150# 150# 150# 300#	3CMBH2411P00 3CMBH2421P00 3CMBH2431P00 3CMBH2442P00	285 740 1480 1480	200 635 1270 1270	285 285 285 400	Carbon Steel	316 SS
	1 X 1	150# 300# 600# 900#	150# 150# 150# 300#	3CMBH3411P00 3CMBH3421P00 3CMBH3431P00 3CMBH3442P00	285 740 1480 1480	200 635 1270 1270	285 285 285 400	Carbon Steel	316 SS
0.125	1/2 X 1	150# 300# 600#	150# 150# 150#	3DMBH1411P00 3DMBH1421P00 3DMBH1431P00	285 740 1480	200 635 1270	285 285 285	Carbon Steel	316 SS
	3/4 X 1	150# 300# 600#	150# 150# 150#	3DMBH2411P00 3DMBH2421P00 3DMBH2431P00	285 740 1480	200 635 1270	285 285 285	Carbon Steel	316 SS
	1 X 1	150# 300# 600#	150# 150# 150#	3DMBH3411P00 3DMBH3421P00 3DMBH3431P00	285 740 1480	200 635 1270	285 285 285	Carbon Steel	316 SS

FOR CORROSIVE & LOW TEMPRATURE SERVICE

PART NAME	316 st.st.		Monel			Hastelloy C		
	NS (NACE)	SS & NA	MB	MT	MC	HB	HT	HC
	-50°F to 750°F	-450°F to 750°F	-50°F to 600°F		-325°F to 600°F	-50°F to 500°F		-325°F to 500°F
Body	___	___	Monel	Monel	Monel	Hastelloy C	Hastelloy C	Hastelloy C
Bonnet	___	SA-351 Gr. CF8M St. St.	___	___	Monel	___	___	Hastelloy C
Disc	___	___	Monel	Monel	Monel	Hastelloy C	Hastelloy C	Hastelloy C
Guide	___	___	___	Monel	Monel	___	Hastelloy C	Hastelloy C
Disc Holder	___	___	___	Monel	Monel	___	Hastelloy C	Hastelloy C
Stem	___	___	___	___	Monel	___	___	Hastelloy C
Sprin Adj. Screw	___	___	___	___	Monel	___	___	Hastelloy C
Jam Nut	___	___	___	___	Monel	___	___	Hastelloy C
Cap. Plain Screwed	___	316 St. St.	___	___	Monel	___	___	Hastelloy C
Cap Gasket	___	___	___	___	Monel	___	___	Hastelloy C
Body Gasket	___	___	___	Monel	Monel	___	Hastelloy C	Hastelloy C
Guide Gasket	___	___	___	Monel	Monel	___	Hastelloy C	Hastelloy C
Spring	Inconel® X-750	316 St. St./ Inconel X-750	___	Inconel X-750	Inconel X-750	___	Inconel X-750	Hastelloy C
Spring Buttons	___	___	___	___	Monel	___		Hastelloy C
O-Ring Retainer	___	316 St. St.	Monel	Monel	Monel	Hastelloy C	Hastelloy C	Hastelloy C
Retainer Lock screw	___	316 St. St.	Monel	Monel	Monel	Hastelloy C	Hastelloy C	Hastelloy C
O-Ring Seat Seal	___	___	___	___	___	___	___	___
Guide Seal	___	___	___	___	___	___	___	___
Disc Holder Seal	___	___	___	___	___	___	___	___
Wire Seal	___	___	___	___	___	___	___	___
Nameplate	___	___	___	___	___	___	___	___
B.W fitting (inlet)	___	___	Monel	Monel	Monel	Hastelloy C	Hastelloy C	Hastelloy C
B.W fitting (outlet)	___	316 St. St.	___	___	Monel	___	___	Hastelloy C
Lap joint Stub End (Inlet)	___	___	Monel	Monel	Monel	Hastelloy C	Hastelloy C	Hastelloy C
Lap Joint Stub End (Outlet)	___	316 St. St.	___	___	Monel	___	___	Hastelloy C
Lap Joint Flange (Inlet)	___	316 St. St.	___	___	Monel	___	___	Hastelloy C
Lap Joint Flange (Outlet)	___	316 St. St.	___	___	Monel	___	___	Hastelloy C

Corrosive & Low-Temperature Service in Safety Relief Valves

Safety relief valves (SRVs) used in corrosive and low-temperature environments require specialized materials and designs to ensure reliability, longevity, and safe operation. These conditions are common in industries such as chemical processing, cryogenics, LNG, pharmaceuticals, and offshore oil & gas.

Key Considerations for Corrosive Service

a) Material Selection

- Stainless Steel (316, 316L, 321, 347): Good resistance to mild acids and general corrosion.
- Hastelloy (C-22, C-276): Ideal for highly aggressive chemical environments.
- Monel (400, K-500): Excellent for seawater and acid-resistant applications.
- Inconel (600, 625): High resistance to oxidation and chloride-induced corrosion.
- Teflon (PTFE) & PFA Lining: Used for internal components in highly reactive chemical processes.

b) Coatings & Surface Treatments

- Electropolishing: Enhances corrosion resistance by removing surface impurities.
- Nickel & Chrome Plating: Provides an extra protective barrier.
- Epoxy Coatings: Used for external surfaces to protect against harsh environmental exposure.

c) Sealing & Soft Seat Options

- PTFE (Teflon) Seats & Seals: Suitable for aggressive chemical media.
- Elastomers (Viton, EPDM, Kalrez): Selected based on chemical compatibility.

CAPACITY TABLE

AIR 10% OVERPRESSURE Capacities in Standard Cubic Feet Per Minute at 60°F					
Set Pressure (PSIG)	Orifice Area. Sq. In.				
	C	D	E	F	G
	0.068	0.125	0.223	0.350	0.537
15	35	65	117	183	301
20	41	75	135	212	347
30	52	95	171	268	439
40	64	117	210	330	540
50	76	140	249	392	642
60	88	162	288	454	743
70	100	184	328	515	844
80	112	206	368	577	946
90	124	228	407	639	1047
100	136	250	447	701	1148
150	196	361	644	1011	1655
200	256	471	841	1320	2161
250	316	582	1038	1630	2668
300	376	692	1235	1939	3175
350	436	803	1432	2248	3681
400	497	913	1630	2558	4188
450	557	1024	1827	2867	4695
500	617	1134	2024	3177	5201
550	677	1245	2221	3486	5708
600	737	1355	2418	3796	6215
650	797	1466	2615	4105	6721
700	857	1576	2813	4415	7228
750	917	1687	3010	4724	7735
800	978	1797	3207	5034	8241
850	1038	1908	3404	5343	8748
900	1098	2018	3601	5653	9255
950	1158	2129	3799	5962	9761
1000	1218	2240	3996	6272	10268
1050	1278	2350	4193	6581	--
1100	1338	2461	4390	6891	--
1150	1398	2571	4587	7200	--
1200	1459	2682	4784	7509	--
1250	1519	2792	4982	7819	--
1300	1579	2903	5179	8128	--
1350	1639	3013	5376	8438	--
1400	1699	3124	5573	8747	--
1450	1759	3234	5770	9057	--
1500	1819	3345	5967	9366	--
1550	1879	3455	6165	9676	--
1600	1940	3566	6362	9985	--
1650	2000	3676	6559	--	--
1700	2060	3787	6756	--	--
1750	2120	3897	6953	--	--
1800	2180	4008	7151	--	--
1850	2240	4118	7348	--	--
1900	2300	4229	7545	--	--
2000	2421	4450	7939	--	--
2100	2541	4671	8334	--	--
2200	2661	4892	8728	--	--
2300	2781	5113	9122	--	--
2400	2902	5334	9577	--	--
2500	3022	5555	9911	--	--
2600	3142	5776	--	--	--
2700	3262	5997	--	--	--
2800	3383	6218	--	--	--
2900	3503	6439	--	--	--
3000	3623	6661	--	--	--
3500	4224	7766	--	--	--
4000	4826	8871	--	--	--
4500	5427	9976	--	--	--
5000	6028	11081	--	--	--
5500	6629	--	--	--	--
6000	7231	--	--	--	--
6500	7832	--	--	--	--

WATER 10% OVERPRESSURE Capacities in U.S Gallons Per Minute at 70°F					
Set Pressure (PSIG)	Orifice Area. Sq. In.				
	C	D	E	F	G
	0.068	0.125	0.223	0.350	0.537
15	7.4	13.6	24.3	38.1	62.4
20	8.3	15.3	27.4	43.1	70.5
30	10.0	18.4	32.9	51.6	84.5
40	11.5	21.2	37.9	59.6	97.6
50	12.9	23.8	42.4	66.6	109
60	14.1	26.0	46.5	73.0	119
70	15.3	28.1	50.2	78.8	129
80	16.3	30.1	53.7	84.3	138
90	17.3	31.9	56.9	89.4	146
100	18.3	33.6	60.0	94.2	154
150	22.4	41.2	73.5	115	189
200	25.9	47.6	84.9	133	218
250	28.9	53.2	94.9	149	244
300	31.7	58.3	104	163	267
350	34.2	63.0	112	176	288
400	36.6	67.3	120	188	308
450	38.8	71.4	127	200	327
500	40.9	75.3	134	210	345
550	42.9	78.9	140	221	362
600	44.8	82.4	147	230	378
650	46.7	85.8	153	240	393
700	48.4	89.0	158	249	408
750	50.1	92.2	164	258	422
800	51.8	95.2	169	266	436
850	53.4	98.1	175	274	450
900	54.9	101	180	282	463
950	56.4	103	185	290	475
1000	57.9	106	189	298	488
1050	59.3	109	194	305	--
1100	60.7	111	199	312	--
1150	62.1	114	203	319	--
1200	63.4	116	208	326	--
1250	64.7	119	212	333	--
1300	66.0	121	216	339	--
1350	67.3	123	220	346	--
1400	68.5	126	224	352	--
1450	69.7	128	228	359	--
1500	70.9	130	232	365	--
1550	72.1	132	236	371	--
1600	73.2	134	240	377	--
1650	74.7	136	244	--	--
1700	75.5	138	247	--	--
1750	76.6	140	251	--	--
1800	77.7	142	254	--	--
1850	78.7	144	258	--	--
1900	79.8	146	261	--	--
2000	81.9	150	268	--	--
2100	83.9	154	275	--	--
2200	85.9	157	281	--	--
2300	87.8	161	288	--	--
2400	89.7	164	294	--	--
2500	91.5	168	300	--	--
2600	93.4	171	--	--	--
2700	95.1	174	--	--	--
2800	96.9	178	--	--	--
2900	98.6	181	--	--	--
3000	100	184	--	--	--
3500	108	199	--	--	--
4000	115	212	--	--	--
4500	122	225	--	--	--
5000	129	238	--	--	--
5500	135	--	--	--	--
6000	141	--	--	--	--
6500	147	--	--	--	--

STEAM 10% OVERPRESSURE Capacities in Pounds Per Hour at Saturation Temperature					
Set Pressure (PSIG)	Orifice Area, Sq. In.				
	C	D	E	F	G
	0.068	0.125	0.223	0.350	0.573
15	100	184	329	516	846
20	115	212	379	595	975
30	146	269	480	754	1234
40	180	331	591	927	1519
50	214	393	702	1101	1803
60	247	455	812	1275	2088
70	281	517	923	1449	2373
80	315	579	1034	1623	2657
90	349	641	1145	1797	2942
100	382	704	1255	1971	3227
150	551	1014	1809	2840	4650
200	720	1325	2363	3710	6073
250	889	1635	2917	4579	7497
300	1058	1946	3471	5448	8920
350	1227	2256	4025	6318	10344
400	1396	2567	4579	7187	11767
450	1565	2877	5133	8057	13190
500	1734	3188	5687	8926	14614
550	1903	3498	6241	9796	16037
600	2072	3809	6795	10665	17461
650	2241	4119	7349	11535	18884
700	2410	4430	7903	12404	20307
750	2578	4740	8457	13273	21731
800	2747	5051	9011	14143	23154
850	2916	5361	9565	15012	24578
900	3085	5672	10119	15882	26001
950	3254	5982	10673	16751	27424
1000	3423	6293	11227	17621	28848
1050	3592	6603	11781	18490	--
1100	3761	6914	12335	19359	--

Capacity in Safety Relief Valves

The capacity of a safety relief valve (SRV) refers to the maximum flow rate it can handle while maintaining system safety. Proper capacity selection ensures that excess pressure is effectively relieved, preventing equipment failure or hazardous conditions.

1. Importance of Capacity in SRVs

- Prevents Overpressure – Ensures the system does not exceed safe operating limits.
- Ensures Compliance – Meets ASME, API, and other regulatory requirements.
- Optimizes Performance – Avoids under-sizing (insufficient relief) or over-sizing (unstable operation).
- Protects Equipment – Maintains safe pressure levels in boilers, pipelines, and vessels.

2. Factors Affecting SRV Capacity

a) Set Pressure & Overpressure

- Set Pressure: The pressure at which the valve opens.
- Overpressure: The pressure above the set pressure that allows full valve opening (typically 10% for conventional valves, 3% for pilot-operated valves).

b) Backpressure

- Affects flow characteristics and valve performance.
- Balanced bellows or pilot-operated valves minimize backpressure effects.

c) Flow Media Characteristics

- Gases & Vapors: Capacity is calculated using equations considering compressibility.
- Liquids: Uses different formulas due to incompressibility.
- Steam: Requires ASME steam flow calculations.

D) Capacity Calculation Methods

SRV capacity is measured in:

- SCFM (Standard Cubic Feet per Minute) for gases
- GPM (Gallons per Minute) for liquids
- lb/hr (Pounds per Hour) for steam

3. Common formulas include:

- For Gases/Vapors (Ideal Gas Equation)

  $W=51.45\times P\times A\times KW = 51.45 \times P \times A \times KW=51.45\times P\times A\times K$

  where:

  W = Flow rate (lb/hr)
  P = Absolute pressure (psia)
  A = Effective discharge area (sq. in)
  K = Flow coefficient

- For Liquids (Bernoulli's Equation-Based Formula)

  $Q=38.25\times A\times P/GQ = 38.25 \times A \times \sqrt{P/G}Q=38.25\times A\times P/G$

  where:

  Q = Flow rate (GPM)
  P = Pressure drop (psi)
  G = Specific gravity

- For Steam (ASME Steam Formula)

  $W=51.5\times P\times AW = 51.5 \times P \times AW=51.5\times P\times A$

4. Capacity Testing & Certification

- ASME Section VIII (Pressure vessels) & Section I (Boilers) define capacity test procedures.
- API 520, API 526, API 527 provide guidelines for valve sizing and capacity testing.
- Certified Flow Ratings from manufacturers ensure performance under real conditions.

Threaded Connection in Safety Relief Valves

Threaded connections are one of the common methods for installing safety relief valves (SRVs) in smaller piping systems. These connections provide a secure and compact attachment, primarily used in low-to-medium pressure applications where frequent disassembly is not required.

1. Importance of Threaded Connections in SRVs

- Compact & Simple Installation – Requires minimal space and tools.
- Cost-Effective – Less expensive than flanged or welded connections.
- Suitable for Low to Medium Pressures – Common in small piping systems and localized pressure relief.
- Easier to Maintain & Replace – Can be removed without disassembling large pipe sections.

2. Types of Threaded Connections in SRVs

a) NPT (National Pipe Thread - Tapered) [ANSI/ASME B1.20.1]

Most commonly used in North America.Provides a tight, leak-resistant seal using thread deformation.Requires thread sealants (Teflon tape or pipe dope) to prevent leaks.

b) BSP (British Standard Pipe) [ISO 228 & ISO 7]

Standard in Europe, Asia, and Australia. Comes in BSPT (Tapered) and BSPP (Parallel) variants.BSPT seals similarly to NPT, while BSPP requires an O-ring or gasket for sealing.

c) SAE Straight Thread (O-Ring Boss - ORB) [SAE J1926]

Uses a straight thread with an O-ring for sealing.More reliable than tapered threads in high-pressure applications.

3. Pressure Ratings of Threaded SRVs

Threaded safety relief valves are generally rated for:Low to medium pressures (Up to 1,500 psi in most cases).Sizes typically range from ¼" to 2" NPT/BSP.For higher pressures, flanged or welded connections are preferred.

4. Applications of Threaded Safety Relief Valves

- Air Compressors & Pneumatic SystemS
- Small Boilers & Water Heaters
- Chemical & Laboratory Equipment
- Cryogenic Systems (With Special Seals)
- HVAC & Refrigeration Units

5. Best Practices for Threaded Connections

- Use Thread Sealant (Teflon Tape or Pipe Dope) – Ensures a leak-proof connection.
- Avoid Over-Tightening – Can damage threads and cause leaks.
- Use a Proper Wrench – To prevent misalignment or stripping.
- Check for Compatibility – Ensure thread type matches the piping system (NP

MATRIC UNITS - THREAD CONNECTIONS: MNPT X FNPT

Orifice Area Sq. mm.	Valve Size Inlet X Outlet	Type Number	Max. set pressure, BAR G -45.6°C to 399°C	Max. Back Pressure BAR G at 37.8°C	MATERIAL BODY / BONNET	MATERIAL SPRING
43.87	1/2 X 1 3/4 X 1 3/4 X 1 1 X 1 1 X 1	3CMM14P00 3CMM24P00 3CMHM24P00 3CMM34P00 3CMHM34P00	110 172 345 172 448	28	CARBON STEEL	316 SS
80.65	1/2 X 1 3/4 X 1 3/4 X 1 1 X 1 1 X 1	3DMM14P00 3DMM24P00 3DMHM24P00 3DMM34P00 3DMHM34P00	110 110 345 110 345	28	CARBON STEEL	316 SS
143.87	1 X 1 1/2	3EMM35P00	172	28	CARBON STEEL	316 SS
225.81	1 1/2 X 2	3FMM46P00	110	28	CARBON STEEL	316 SS
369.68	1 1/2 X 2 1/2	3GMM47P00	69	28	CARBON STEEL	316 SS

FLANGED CONNECTIONS

Orifice Area Sq. mm.	Valve Size Inlet x Outlet	ANSI Flange class		Type Number	Maximum set pressure, Bar G			Max. Back Pressure Bar G at 37.8°F	Materials	
		Inlet RF	Outlet RF		-45.6°C to 37.8°C	204 °C	399° C		Body / Bonnet	Spring
43.87	1/2 X 1	150#	150#	3CMH1411P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3CMH1421P00	51	44	35	20		
		600#	150#	3CMH1431P00	102	88	69	20		
		900#	300#	3CMH1442P00	153	131	104	28		
		1500#	300#	3CMH1452P00	255	218	174	28		
		2500#	300#	3CMH1462P00	345	345	290	28		
	3/4 X 1	150#	150#	3CMH2411P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3CMH2421P00	51	44	35	20		
		600#	150#	3CMH2431P00	102	88	69	20		
		900#	300#	3CMH2442P00	153	131	104	28		
		1500#	300#	3CMH2452P00	255	218	174	28		
		2500#	300#	3CMH2462P00	345	345	290	28		
	1 X 1	150#	150#	3CMH3411P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3CMH3421P00	51	44	35	20		
		600#	150#	3CMH3431P00	102	88	69	20		
		900#	300#	3CMH3442P00	153	131	104	28		
		1500#	300#	3CMH3452P00	255	218	174	28		
		2500#	300#	3CMH3462P00	425	364	290	28		
80.65	1/2 X 1	150#	150#	3DMH1411P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3DMH1421P00	51	44	35	20		
		600#	150#	3DMH1431P00	102	88	69	20		
		900#	300#	3DMH1442P00	153	131	104	28		
	3/4 X 1	150#	150#	3DMH2411P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3DMH2421P00	51	44	35	20		
		600#	150#	3DMH2431P00	102	88	69	20		
		900#	300#	3DMH2442P00	153	131	104	28		
		1500#	300#	3DMH2452P00	255	218	174	28		
		2500#	300#	3DMH2462P00	345	345	290	28		
	1 X 1	150#	150#	3DMH3411P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3DMH3421P00	51	44	35	20		
		600#	150#	3DMH3431P00	102	88	69	20		
		900#	300#	3DMH3442P00	153	131	104	28		
		1500#	300#	3DMH3452P00	255	218	174	28		
		2500#	300#	3DMH3462P00	425	364	290	28		
143.87	1 X 1 1/2	150#	150#	3EMH3511P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3EMH3521P00	51	44	35	20		
		600#	150#	3EMH3531P00	102	88	69	20		
		900#	300#	3EMH3542P00	153	131	104	28		
225.81	1 1/2 X 2	150#	150#	3FMH4611P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3FMH4621P00	51	44	35	20		
		600#	150#	3FMH4631P00	102	88	69	20		
369.68	1 1/2 X 2 1/2	150#	150#	3GMH4711P00	20	14	6	20	Carbon Steel	316 SS
		300#	150#	3GMH4721P00	51	44	35	20		
		600#	150#	3GMH4731P00	69	69	69	20		

BALANCED DESIGN- THREAD CONNECTIONS: MNPT X FNPT

Orifice Area Sq. mm.	Valve Size Inlet X Outlet	Type Number	Maximum Set Pressure, BARG	Max. Back Pressure BAR G at 37.8° C	Materials	
			-28.9° C to 232° C		Body / Bonnet	Spring
43.87	1/2 X 1 3/4 X 1 1 X 1	3CMBM14P00 3CMBM24P00 3CMBM34P00	102	28	Carbon Steel	316 SS
80.65	1/2 X 1 3/4 X 1 1 X 1	3DMBM14P00 3DMBM24P00 3DMBM34P00	102	28	Carbon Steel	316 SS

Flanged Connection in Safety Relief Valves

Flanged connections are a common method for mounting safety relief valves (SRVs) in pressure systems. They provide a secure, leak-proof, and easily detachable joint between the valve and the pipeline or pressure vessel.

1. Importance of Flanged Connections in SRVs

Ease of Installation & Removal – Facilitates maintenance and replacement.

Leak-Proof Sealing – Ensures tight sealing under high pressure and temperature conditions.

Standardized Design – Complies with international standards like ASME, ANSI, and API.

Structural Strength – Withstands high-pressure applications in industries such as oil & gas, chemical, and power plants.

2. Types of Flange Standards for SRVs

Different industries follow specific flange standards to ensure compatibility and safety.

a) ASME / ANSI Flanges (Most common in the US)

ASME B16.5: Flange sizes from ½" to 24"

ASME B16.47: Large-diameter flanges (26" and above)

b) API Flanges (Used in oil & gas applications)

API 6A: High-pressure wellhead and drilling applications.

c) DIN & EN Flanges (European Standards)

Common in chemical and industrial applications in Europe.

3. Types of Flanged Connections in SRVs

a) Raised Face (RF) Flange

Most widely used in industrial SRVs.

A small raised portion around the bolt holes improves sealing.

Suitable for medium to high-pressure applications.

b) Flat Face (FF) Flange

The sealing surface is completely flat.

Used in low-pressure and cast-iron systems where excessive stress must be avoided.

c) Ring-Type Joint (RTJ) Flange

Features a metal ring gasket for high-pressure, high-temperature applications.

Common in oil, gas, and petrochemical industries.

d) Tongue & Groove (T&G) Flange

Features matching raised (tongue) and recessed (groove) surfaces.

Improves gasket alignment and sealing performance.

4. Pressure Ratings for Flanged SRVs

Flanges are classified by pressure ratings, which determine their ability to withstand different operating conditions.

Common ASME Flange Pressure Classes:

Flange Class	Pressure Rating (psi)
150	Up to 285 psi
300	Up to 740 psi
600	Up to 1,480 psi
900	Up to 2,220 psi
1500	Up to 3,705 psi
2500	Up to 6,170 psi

5. Gasket Selection for Flanged SRVs

Gaskets ensure a tight seal between flanged connections. The choice of gasket depends on pressure, temperature, and media compatibility.

Common Gasket Types:

Spiral Wound Gaskets – Ideal for high-pressure, high-temperature applications.

Metal Ring Joint Gaskets (RTJ) – Used in extreme pressure environments.

PTFE / Teflon Gaskets – Best for corrosive media.

Graphite Gaskets – Suitable for high-temperature steam and chemical applications.

6. Bolt & Torque Considerations

Proper bolting and torque application ensure a secure flanged connection.

Use high-strength bolts (e.g., ASTM A193 B7 for high-pressure applications).

Follow torque specifications to prevent leaks and gasket damage.

FLANGED CONNECTIONS

Orifice Area Sq. mm.	Valve Size Inlet x Outlet	ANSI Flange class		Type Number	Maximum set pressure, BARG		Max. Back Pressure BARG at 37.8°C	Materials	
		Inlet RF	Outlet RF		-28.9°C to 37.8°C	204°F		Body / bonnet	Spring
43.87	1/2 X 1	150# 300# 600# 900#	150# 150# 150# 300#	3CMBH1411P00 3CMBH1421P00 3CMBH1431P00 3CMBH1442P00	20 51 102 102	14 44 88 88	20 20 20 28	Carbon Steel	316 SS
	3/4 X 1	150# 300# 600# 900#	150# 150# 150# 300#	3CMBH2411P00 3CMBH2421P00 3CMBH2431P00 3CMBH2442P00	20 51 102 102	14 44 88 88	20 20 20 28	Carbon Steel	316 SS
	1 X 1	150# 300# 600# 900#	150# 150# 150# 300#	3CMBH3411P00 3CMBH3421P00 3CMBH3431P00 3CMBH3442P00	20 51 102 102	14 44 88 88	20 20 20 28	Carbon Steel	316 SS
80.65	1/2 X 1	150# 300# 600#	150# 150# 150#	3DMBH1411P00 3DMBH1421P00 3DMBH1431P00	20 51 102	14 44 88	20 20 20	Carbon Steel	316 SS
	3/4 X 1	150# 300# 600#	150# 150# 150#	3DMBH2411P00 3DMBH2421P00 3DMBH2431P00	20 51 102	14 44 88	20 20 20	Carbon Steel	316 SS
	1 X 1	150# 300# 600#	150# 150# 150#	3DMBH3411P00 3DMBH3421P00 3DMBH3431P00	20 51 102	14 44 88	20 20 20	Carbon Steel	316 SS

MATRIC UNITS-CAPACITY TABLE

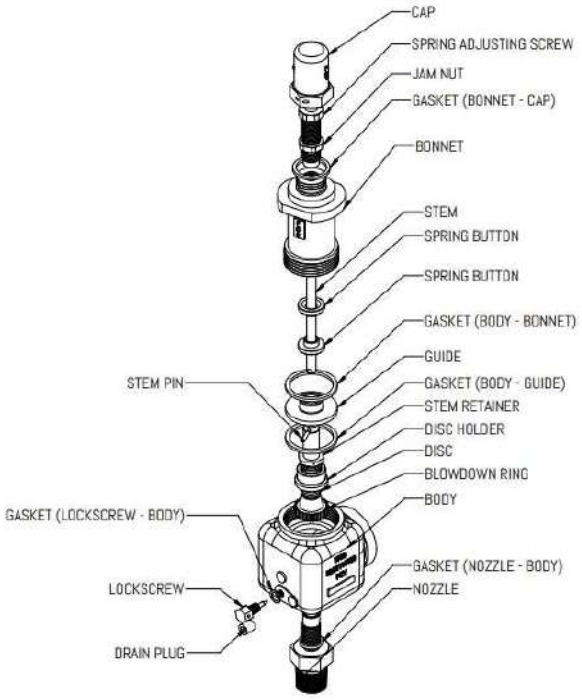
AIR 10% OVERPRESSURE Capacities in Standard Cubic Meters Per Minute at 15.6°C					
Set Pressure (BARG)	Orifice Area. Sq. mm.				
	C	D	E	F	G
	43.87	80.65	143.87	225.81	369.68
1	1.0	1.8	3.3	5.1	8.4
2	1.4	2.7	4.7	7.4	12.2
3	1.9	3.6	6.3	10.0	16.3
4	2.4	4.5	8.0	12.5	20.5
5	2.9	5.4	9.6	15.1	24.6
6	3.4	6.3	11.2	17.6	28.8
7	3.9	7.2	12.8	20.1	33.0
8	4.4	8.1	14.5	22.7	37.1
9	4.9	9.0	16.1	25.2	41.3
10	5.4	9.9	17.7	27.8	45.5
12	6.4	11.7	20.9	32.8	53.8
14	7.4	13.5	24.2	37.9	62.1
16	8.4	15.4	27.4	43.0	70.4
18	9.3	17.2	30.6	48.1	78.8
20	10.3	19.0	33.9	53.2	87.1
25	12.8	23.5	42.0	65.9	107.9
30	15.3	28.1	50.1	78.6	128.7
35	17.7	32.6	58.2	91.3	149.5
40	20.2	37.2	66.3	104.0	1700.3
45	22.7	41.7	74.4	116.7	191.1
50	25.1	46.2	82.5	129.5	211.9
55	27.6	50.8	90.6	142.2	232.7
60	30.1	55.3	98.7	154.9	253.6
65	32.5	59.9	106.8	167.6	274.4
70	35.0	64.4	114.9	180.3	295.2
75	37.5	68.9	123.0	193.0	--
80	40.0	73.5	131.1	205.7	--
85	42.4	78.0	139.2	218.4	--
90	44.9	82.5	147.3	231.1	--
95	47.4	87.1	155.4	243.9	--
100	49.8	91.6	163.5	256.6	--
105	52.3	96.2	171.6	269.3	--
110	54.8	100.7	179.7	282.0	--
115	57.2	105.2	187.8	--	--
120	59.7	109.8	195.9	--	--
125	62.2	114.3	204.0	--	--
130	64.7	118.9	212.1	--	--
135	67.1	123.4	220.2	--	--
140	69.6	127.9	228.3	--	--
145	72.1	132.5	236.4	--	--
150	74.5	137.0	244.5	--	--
155	77.0	141.6	252.6	--	--
160	79.5	146.1	260.7	--	--
165	81.9	150.6	268.8	--	--
170	84.4	155.2	276.9	--	--
175	86.9	159.7	--	--	--
180	89.3	164.3	--	--	--
185	91.8	168.8	--	--	--
190	94.3	173.3	--	--	--
195	96.8	177.9	--	--	--
200	99.2	182.4	--	--	--
220	109.1	200.6	--	--	--
240	119.0	218.7	--	--	--
260	128.9	236.9	--	--	--
280	138.7	255.1	--	--	--
300	148.6	273.2	--	--	--
320	158.5	291.4	--	--	--
340	168.4	309.5	--	--	--
360	178.2	--	--	--	--
380	188.1	--	--	--	--
400	6028	--	--	--	--
420	6629	--	--	--	--
440	7231	--	--	--	--
448	7832	--	--	--	--

WATER 10% OVERPRESSURE Capacities in U.S Liters Per Minute at 21°C[3]					
Set Pressure (BARG)	Orifice Area. Sq. mm.				
	C	D	E	F	G
	43.87	80.65	143.87	225.81	369.68
1	27.6	50.8	90.7	142	233
2	37.4	68.7	122	192	315
3	45.7	84.0	150	135	385
4	52.8	97.0	173	271	445
5	59.4	108	193	303	497
6	64.6	118	212	332	545
7	69.8	128	229	359	588
8	74.6	137	244	384	629
9	79.2	145	259	407	667
10	83.5	153	273	429	703
12	91.4	168	300	470	770
14	98.8	181	324	508	832
16	105	194	346	543	890
18	112	205	367	576	944
20	118	217	387	607	995
25	132	242	433	679	1112
30	144	265	474	744	1218
35	156	287	512	804	1316
40	167	307	547	859	1407
45	177	325	580	911	1492
50	186	343	612	961	1573
55	195	360	642	1008	1650
60	204	376	670	1052	1723
65	212	391	698	1095	1794
70	220	406	724	1137	1861
75	228	420	750	1177	--
80	236	434	774	1215	--
85	243	447	798	1253	--
90	250	460	821	1289	--
95	257	473	844	1324	--
100	264	485	866	1359	--
105	270	497	887	1392	--
110	276	509	908	1425	--
115	283	520	928	--	--
120	289	531	948	--	--
125	295	542	968	--	--
130	301	553	987	--	--
135	306	564	1006	--	--
140	312	574	1024	--	--
145	318	584	1042	--	--
150	323	594	1060	--	--
155	328	604	1078	--	--
160	334	614	1095	--	--
165	339	623	1112	--	--
170	344	632	1129	--	--
175	349	642	--	--	--
180	354	651	--	--	--
185	359	660	--	--	--
190	364	669	--	--	--
195	368	677	--	--	--
200	373	686	--	--	--
220	391	720	--	--	--
240	409	752	--	--	--
260	425	782	--	--	--
280	441	812	--	--	--
300	457	840	--	--	--
320	472	868	--	--	--
340	486	895	--	--	--
360	501	--	--	--	--
380	514	--	--	--	--
400	528	--	--	--	--
420	541	--	--	--	--
440	553	--	--	--	--
448	558	--	--	--	--

MATRIC UNITS-CAPACITY TABLE

STEAM 10% OVERPRESSURE Capacities in Kilograms Per Hour at Saturation Temperature					
Set Pressure (BARG)	Orifice Area. Sq. mm.				
	C	D	E	F	G
	43.87	80.65	143.87	225.81	369.68
1	44	82	147	231	378
2	65	119	213	335	548
3	87	160	286	448	734
4	109	201	358	563	921
5	132	242	431	677	1109
6	154	283	504	792	1296
7	176	323	577	906	1483
8	198	364	650	1020	1671
9	220	405	723	1135	1858
10	243	446	796	1249	2045
12	287	528	942	1478	2420
14	332	610	1087	1707	2794
16	376	691	1233	1936	3169
18	420	773	1379	2165	3544
20	465	855	1525	2393	3918
25	576	1059	1889	2965	4854
30	687	1263	2253	3537	5791
35	798	1467	2618	4109	6727
40	909	1672	2982	4681	7664
45	1021	1876	3347	5253	8600
50	1132	2080	3711	5825	9537
55	1243	2284	4076	6397	10473
60	1354	2489	4440	6969	11409
65	1465	2693	4805	7541	12346
70	1576	2898	5169	8113	13282
75	1687	3102	5533	8685	14219

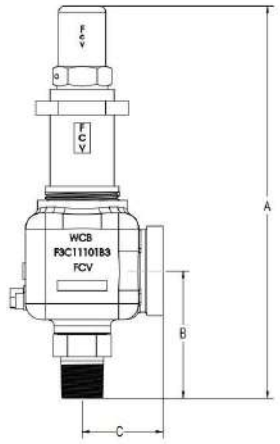
PRESSURE RELIEF VALVE PARTS ASSEMLY VIEW

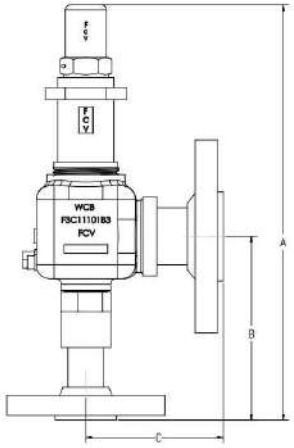


Flanged Pressure Relief Valve

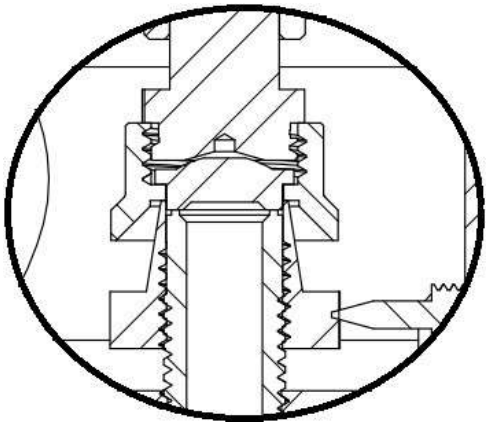
Threaded Pressure Relief Valve

Dimensions Threaded & Flange type





Orifice Area Sq. In.	Valve Size Inlet X Outlet	A	B	C
C/0.068	1/2 X 1	197	64	40
	3/4 X 1	197	64	40
	3/4 X 1	197	64	40
	1 X 1	197	64	40
	1 X 1	197	64	40
D/0.125	1/2 X 1	196	64	40
	3/4 X 1	196	64	40
	3/4 X 1	196	64	40
	1 X 1	196	64	40
	1 X 1	196	64	40
E/0.223	1 X 1 1/2	218	69	52
F/0.350	1 1/2 X 2	258	83	60
G/0.573	1 1/2 X 2 1/2	260	83	60



Orifice Area Sq. In.	Valve Size Inlet x Outlet	ANSI Flange class		A	B	C
		Inlet RF	Outlet RF			
C/0.068	1/2 X 1	150#	150#	244	117	108
		300#	150#	244	117	108
		600#	150#	244	117	108
		900#	300#	244	117	108
		1500#	300#	244	117	108
		2500#	300#	244	117	108
	3/4 X 1	150#	150#	244	117	108
		300#	150#	244	117	108
		600#	150#	244	117	108
		900#	300#	244	117	108
		1500#	300#	244	117	108
		2500#	300#	244	117	108
	1 X 1	150#	150#	244	117	108
		300#	150#	244	117	108
		600#	150#	244	117	108
		900#	300#	244	117	108
		1500#	300#	244	117	108
		2500#	300#	244	117	108
D/0.125	1/2 X 1	150#	150#	260	117	108
		300#	150#	260	117	108
		600#	150#	260	117	108
		900#	300#	260	117	108
	3/4 X 1	150#	150#	260	117	108
		300#	150#	260	117	108
		600#	150#	260	117	108
		900#	300#	260	117	108
		1500#	300#	260	117	108
		2500#	300#	260	117	108
	1 X 1	150#	150#	260	117	108
		300#	150#	260	117	108
		600#	150#	260	117	108
		900#	300#	260	117	108
		1500#	300#	260	117	108
		2500#	300#	260	117	108
E/0.223	1 X 1 1/2	150#	150#	279	117	117
		300#	150#	279	117	117
		600#	150#	279	117	117
		900#	300#	279	117	117
F/0.350	1 1/2 X 2	150#	150#	314	143	121
		300#	150#	314	143	121
		600#	150#	314	143	121
G/0.573	1 1/2 X 2 1/2	150#	150#	356	149	137
		300#	150#	356	149	137
		600#	150#	356	149	137

Unit Conversion for Pressure, Temperature, and Flow Capacity

Proper unit conversion is essential in selecting and analysing safety relief valves (SRVs), as different industries and standards use varying measurement units. Below are common conversions for pressure, temperature, and flow capacity.

1. Pressure Unit Conversion

Pressure is commonly measured in **psi, bar, kPa, mmHg, atm**, etc.

Unit	To psi (Multiply by)	To bar (Multiply by)	To kPa (Multiply by)	To atm (Multiply by)
1 psi	1.0	0.06895	6.895	0.06804
1 bar	14.5038	1.0	100	0.98692
1 kPa	0.14504	0.01	1.0	0.009869
1 atm	14.696	1.01325	101.325	1.0
1 mmHg	0.01934	0.001333	0.1333	0.001315

Example: Convert **50 psi** to **bar**

50×0.06895=3.4475 bar50\times0.06895=3.4475\text{bar}50×0.06895=3.4475 bar

2. Temperature Unit Conversion

Temperature is measured in **Celsius (°C), Fahrenheit (°F), and Kelvin (K).**

Unit	To °C	To °F	To K
°C to °F	(°C × 9/5) + 32	—	°C + 273.15
°F to °C	(°F − 32) × 5/9	—	(°F − 32) × 5/9 + 273.15
K to °C	K − 273.15	(K − 273.15) × 9/5 + 32	—

Example: Convert **100°C** to **Fahrenheit**

(100×95)+32=212°F(100 \times \frac{9}{5}) + 32 = 212°F(100×59)+32=212°F

Example: Convert **500 K** to **Celsius**

500−273.15=226.85°C500 - 273.15 = 226.85°C500−273.15=226.85°C

3. Flow Capacity Unit Conversion

Flow capacity in safety relief valves depends on whether the medium is **gas, liquid, or steam**.

a) Gas & Air Flow (Standard Cubic Feet per Minute - SCFM, Nm³/h, L/min)

Unit	To SCFM (Multiply by)	To Nm³/h (Multiply by)	To L/min (Multiply by)
1 SCFM	1.0	1.69	28.32
1 Nm³/h	0.59	1.0	16.67
1 L/min	0.03531	0.06	1.0

- **Example:** Convert **100 SCFM** to **Nm³/h**
- 100×1.69=169 Nm³/h100 \times 1.69 = 169 \text{ Nm³/h}100×1.69=169 Nm³/h

b) Liquid Flow (Gallons per Minute - GPM, Liters per Minute - LPM, Cubic Meters per Hour - m³/h)

Unit	To GPM (Multiply by)	To LPM (Multiply by)	To m³/h (Multiply by)
1 GPM	1.0	3.785	0.2271
1 LPM	0.2642	1.0	0.06
1 m³/h	4.4029	16.67	1.0

- **Example: Convert 50 GPM to LPM**
- 50×3.785=189.25 LPM50\times3.785=189.25 \text{ LPM}50×3.785=189.25 LPM

c) Steam Flow (lbs/hr, kg/hr, Tons per Hour - TPH)

Unit	To lb/hr (Multiply by)	To kg/hr (Multiply by)	To TPH (Multiply by)
1 lb/hr	1.0	0.4536	0.0004536
1 kg/hr	2.2046	1.0	0.001
1 TPH	2204.6	1000	1.0

Example: Convert **500 lb/hr** to **kg/hr**

500×0.4536=226.8 kg/hr500\times0.4536=226.8\text{kg/hr}500×0.4536=226.8kg/hr
500 x0.4536=226.8 kg/hr

Shop facilities

Functional test bench

Following testing can be performed

- Set pressure test.
- Seat tightness test as per. API 527.
- Secondary pressure zone test.
- Test medium - Air, Nitrogen, & Water.

Performance testing skid - Air & Water

Following testing can be performed

- Reseating / Blow down pressure.
- Lift measurement.
- Flow measurement.
- Pressure range up to 56 bar.
- Test medium - Air & Water.

Hydrostatic test bench

Following Testing can be performed

- Hydrostatic test as per. ASME B16.34.
- Shell test for following parts
- Body, Bonnet, Cap & Nozzle.
- Shell test can be performed 1.5 times of working pressure.
- Capable to test up to 2500# flange rating.
- Test medium - De-minaralized water

Lapping & Polishing Machine

- Lapping and polishing of nozzle and disc seating surface.
- Abrasive used diamond slurry 3 micron.

Pressure relief valves

Series 3000

Pipe line valves

Diaphragm valves

Series 6000

Resilient seated gate valve

Certifications

BAS ISO certificate

TUV nord certificate

IEC certificate

Manufactured by

Fluid control valves and components
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