Full Lift Full Nozzle Safety Relief Valve

Catalogue

INTRODUCTION

VYTAL CONTROLS PVT. LTD. is founded in the year 2020. We are in the field of design, engineering, manufacturing & supply of Control Valve, Self Actuated Pressure Control Valves, Safety Relief Valves, Pressure Reducing Stations, Desuperheaters & Pressure Reducing Cum Desuperheating Stations suitable to various industries. We have Team of Experts who has sound & healthy experience of more than 20 years in the same field.

We are strongly committed to provide product quality by our most experienced personal and professionally managed Quality System.

Design Capability

To ensure comprehensive customer service, latest version of software with synchronous technology being used for mechanical assembly, part modeling, drawing production and simulation. This will help to achieve maximum customer satisfaction by providing consistent, reliable, latest technological and cost effective products. The system is equipped with multi work stations and improves our efficiency and ultimately the service to our customers.

Quality Assurance

Increasingly quality control procedures are regularly being met throughout the production process. Vytal has established a quality control system. This organisation has, written in a quality control manual, the quality expected and proved at each stage of manufacturing, stocking, machining, assembly, inspection and testing so that the level of quality required is achieved.

Tailor made quality assurance programs are applied for critical service & special applications.

Product Features

- Low Capital Cost.
- High Dependability.
- Ability to maximise operating pressure for optimum system output.
- Careful preparation of the seating surfaces to maintain premium tightness.
- Guaranteed delivery date.
- Full Nozzle with self-aligning temperature equalizing flat face valve disc.
- Large Variety of body and other parts materials are available suitable to standard as well as corrosive applications.

Design Features

- Quality assurance program complies with Section I and VIII of the ASME code.
- Full Lift Full Nozzle Safety Relief Valve is designed confirming to API Std. 520, 521, 526 & 527.
- Suitable to meet various industrial applications for steam, gas & liquid.
- High interchangeability of parts to bring down plant level inventory of spare parts.
- IBR Approved Design.
- Successfully passed Safety Valve Discharge Efficiency Test as per Appendix L of IBR, 1950.

Industries We Serve

- Power Plant
- Oil & Gas
- Chemical
- Petrochemical
- Fertilizer
- Steel
- Sugar
- Paper
- Pharmaceutical
- Dairy
- Other allied process industries

Series 10000

De-codification System

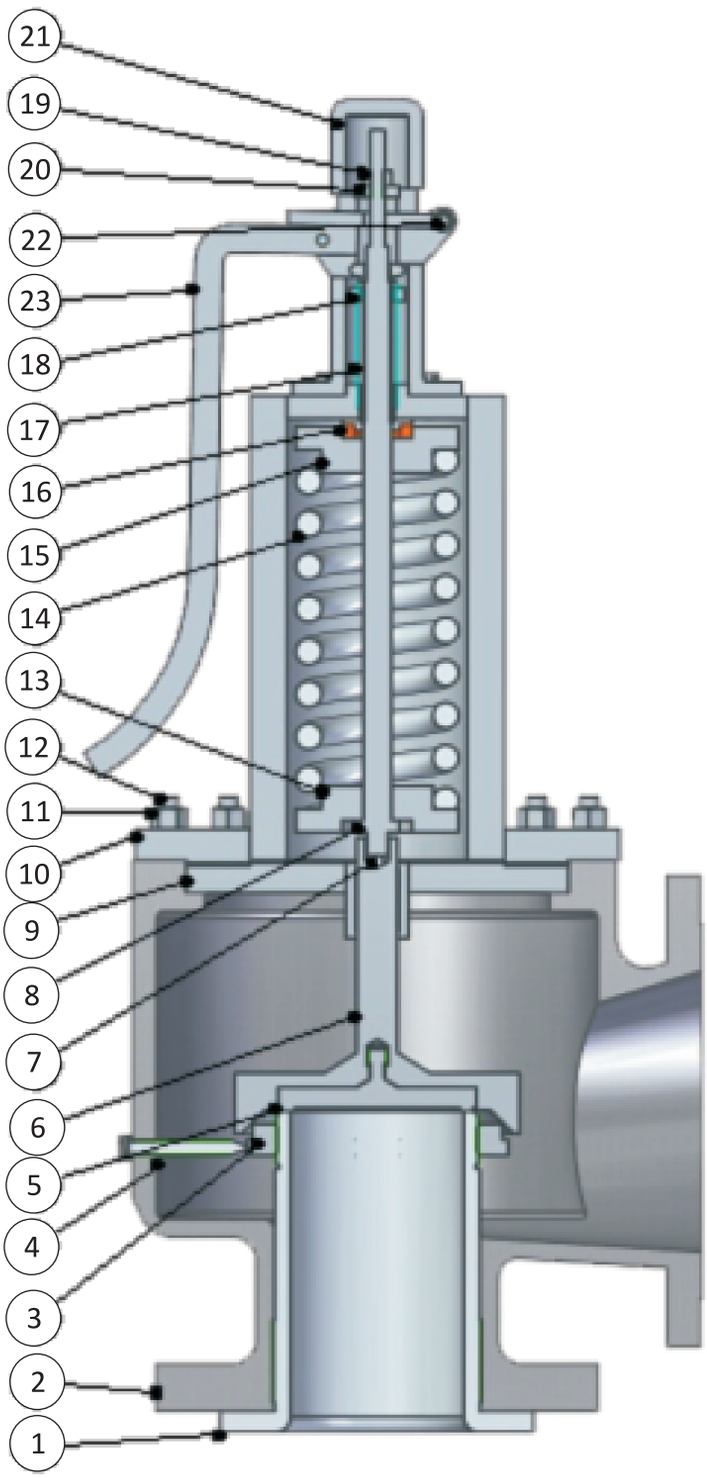
10	0	00		0	Prefix
Series	Inlet Size	Orifice		Outlet Size	
Designates Full Lift Full Nozzle Conventional Safety Relief Valve in cast steel construction	Designates Inlet Size of Safety Relief Valve	Orifice Designation	Area in Sq. Inch	Area in Sq. mm	Designates outlet Size of Safety Relief Valve	Designates approval certificate
	1”	D	0.110	71	2”	IBR
	$1^1/_2$”	E	0.196	126	$2^1/_2$”	Non - IBR
	2”	F	0.307	198	3”	
	3”	G	0.503	325	4”	
	4”	H	0.785	506	6”	
	6”	J	1.287	830	8”	
	8”	K	1.838	1186	10”	
		L	2.853	1841		
		M	3.600	2323		
		N	4.340	2800		
		P	6.380	4116		
		Q	11.050	7129		
		R	16.000	10323		
		T	26.000	16774		
		G*	0.785	506		

Note: * marked orifice is not as per API standard.

General Information

- Our typical de-codification system illustrates basic information about safety valve.
- We offer large variety of sizes with different types of materials of construction to suite all applications.
- Available variety of body materials like WCB, WC6, CF8M etc.
- Different type of end connections are available like screwed end, socket weld, flanged end etc. with pressure class from 150# to 2500#.

Part Detail



Sr. No.	Part Description
1	Nozzle
2	Body
3	Blow Down Ring
4	Blow Down Ring Pin
5	Disc
6	Disc Holder
7	Ball
8	Stem
9	Guide Plate
10	Bonnet
11	Hex Nut (Body)
12	Body Stud
13	Spring Button (Lower)
14	Spring
15	Spring Button (Upper)
16	Bearing
17	Setting Screw
18	Setting Screw Check Nut
19	Prelim Nut
20	Check Nut
21	Cap
22	Lever Pin
23	Lever

General Note:

- For different material of construction, please refer “Bill of Material” page.
- For open & packed lever materials and test gags, please refer “Accessories” page.

Bill of Materials

Item Sr. No.	Item Description	General Service	Corrosive Service	High Temperature Service	Cryogenic Service
1	Body	A 216 Gr. WCB	A 351 Gr. CF8 / 8M	A 217 Gr. WC6, Alloy Steel	A 352 Gr. LCB
2	Bonnet	A 216 Gr. WCB	A 351 Gr. CF8 / 8M	A 217 Gr. WC6, Alloy Steel	A 352 Gr. LCB
3	Cap	A 216 Gr. WCB	A 351 Gr. CF8 / 8M	A 216 Gr. WCB	A 351 Gr. CF8M
4	Nozzle	SS 316	SS 316	SS 316	SS 316
5	Blowdown Ring	SS 316	SS 316	SS 316	SS 316
6	Blowdown Ring Pin	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
7	Disc	SS 316	SS 316	SS 316	SS 316
8	Disc Holder	SS 316	SS 316	SS 316	SS 316
9	Ball	SS	SS	SS	SS
10	Guide Plate	SS 316	SS 316	SS 316	SS 316
11	Stem	SS 316	SS 316	SS 316	SS 316
12	Hex Nut (Body)	A 194 Gr. 2H	A 194 Gr. 8M	A 194 Gr. 2H	A 194 Gr. 8M
13	Body Stud	A 193 Gr. B7	A 193 Gr. B8M	A 193 Gr. B7	A 193 Gr. B8M
14	Spring Button (Lower)	CS Zinc Plated	SS 316	SS 316	SS 316
15	Spring	Spring Steel / Alloy Steel	Stainless Steel / Alloy Steel	Alloy Steel	Stainless Steel
16	Spring Button (Upper)	CS Zinc Plated	SS 316	SS 316	SS 316
17	Bearing	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
18	Setting Screw	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
19	Setting Screw Check Nut	SS 316	SS 316	SS 316	SS 316
20	Prelim Nut	SS 316	SS 316	SS 316	SS 316
21	Check Nut	SS 316	SS 316	SS 316	SS 316
22	Lever Pin	SS	SS	SS	SS
23	Lever	CS	SS 316	CS	CS
24	Gasket	Non Asbestos	Non Asbestos	Non Asbestos	Non Asbestos
25	Lead Seal	Lead	Lead	Lead	Lead
26	Seal Wire	SS	SS	SS	SS

Overall Dimensions & Weight

Sr. No.	Inlet Size	Outlet Size	Orifice Designation	End Connection	Height A	Centre to Outlet Face B	Centre to Inlet Face C	Weight in Lbs (Approx.)
1	1"	2"	D	150# x 150#	22"	4 1/8"	4 1/2"	36
2	1"	2"	D	300# x 150#	22"	4 1/8"	4 1/2"	36
3	1"	2"	D	600# x 150#	22"	4 1/8"	4 1/2"	36
4	1 1/2"	2"	D	900# x 300#	27"	4 1/8"	5 1/2"	42
5	1 1/2"	2"	D	1500# x 300#	27"	4 1/8"	5 1/2"	42
6	1 1/2"	3"	D	2500# x 300#	27"	5 1/2"	7	68
7	1"	2"	E	150# x 150#	22"	4 1/8"	4 1/2"	36
8	1"	2"	E	300# x 150#	22"	4 1/8"	4 1/2"	36
9	1"	2"	E	600# x 150#	22"	4 1/8"	4 1/2"	36
10	1 1/2"	2"	E	900# x 300#	22"	4 1/8"	5 1/2"	42
11	1 1/2"	2"	E	1500# x 300#	27"	4 1/8"	5 1/2"	42
12	1 1/2"	3"	E	2500# x 300#	27"	5 1/2"	7	68
13	1 1/2"	2"	F	150# x 150#	23"	4 7/8"	4 3/4"	37
14	1 1/2"	2"	F	300# x 150#	23"	4 7/8"	4 3/4"	37
15	1 1/2"	2"	F	600# x 150#	27"	4 7/8"	6	42
16	1 1/2"	3"	F	900# x 300#	27"	4 7/8"	6 1/2"	58
17	1 1/2"	3"	F	1500# x 300#	27"	4 7/8"	6 1/2"	58
18	1 1/2"	3"	F	2500# x 300#	27"	5 1/2"	7	68
19	1 1/2"	3"	G	150# x 150#	22"	4 7/8"	4 3/4"	42
20	1 1/2"	3"	G	300# x 150#	22"	4 7/8"	4 3/4"	42
21	1 1/2"	3"	G	600# x 150#	27"	4 7/8"	6	42
22	1 1/2"	3"	G	900# x 300#	27"	4 7/8"	6 1/2"	58
23	2"	3"	G	1500# x 300#	28"	6 1/8"	6 3/4"	72
24	2"	3"	G	2500# x 300#	28"	6 1/8"	6 3/4"	80
25	1"	2 1/2"	G*	150# x 150#	23"	4 1/8"	4 1/2"	38
26	1"	2 1/2"	G*	300# x 150#	23"	4 1/8"	4 1/2"	38
27	1"	2 1/2"	G*	600# x 150#	23"	4 1/8"	4 1/2"	38
28	1 1/2"	2 1/2"	G*	150# x 150#	24"	4 7/8"	4 3/4"	37
29	1 1/2"	2 1/2"	G*	300# x 150#	24"	4 7/8"	4 3/4"	37
30	1 1/2"	2 1/2"	G*	600# x 150#	24"	4 7/8"	4 3/4"	37
31	1 1/2"	3"	H	150# x 150#	24"	5 1/8"	4 7/8"	46
32	1 1/2"	3"	H	300# x 150#	24"	5 1/8"	4 7/8"	46
33	2"	3"	H	300# x 150#	27"	5 1/8"	4 7/8"	60
34	2"	3"	H	600# x 150#	28"	6 1/16"	6 3/8"	60
35	2"	3"	H	900# x 150#	28"	6 1/16"	6 3/8"	72
36	2"	3"	H	1500# x 300#	28"	6 1/16"	6 3/8"	72
37*	1 1/2"	3"	J	150# x 150#	24"	5 1/8"	4 7/8"	46
38*	1 1/2"	3"	J	300# x 150#	24"	5 1/8"	4 7/8"	46
39*	1 1/2"	3"	J	600# x 150#	24"	5 1/8"	4 7/8"	46
40	2"	3"	J	150# x 150#	27"	5 3/8"	4 7/8"	49

Overall Dimensions & Weight

Sr. No.	Inlet Size	Outlet Size	Orifice Designation	End Connection	Height A	Centre to Outlet Face B	Centre to Inlet Face C	Weight in Lbs (Approx.)
41	2”	3”	J	300# x 150#	27”	5 3/8”	4 7/8”	36
42	3”	4”	J	300# x 150#	34”	7 1/4”	7 1/8”	128
43	3”	4”	J	600# x 150#	43”	7 1/4”	7 1/8”	148
44	3”	4”	J	900# x 150#	43”	7 1/4”	7 1/8”	148
45	3”	4”	J	1500# x 300#	43”	7 1/4”	4 7/8”	148
46*	2”	4”	K	150# x 150#	27”	5 3/8	4 7/8”	50
47*	2”	4”	K	300# x 150#	27”	5 3/8”	4 7/8”	50
48*	2”	4”	K	600# x 150#	27”	5 3/8”	4 7/8”	50
49	3”	4”	K	150# x 150#	30”	6 1/8”	6 3/8”	125
50	3”	4”	K	300# x 150#	30”	6 1/8”	6 3/8”	125
51	3”	4”	K	600# x 150#	30”	6 1/8”	6 3/8”	136
53	3”	6”	K	900# x 150#	42”	7 13/16”	8 1/2”	195
54	3”	6”	K	1500# x 300#	42”	7 3/4”	8 1/2”	195
55	3”	4”	L	150# x 150#	30”	6 1/8”	6 1/8”	125
56	3”	4”	L	300# x 150#	30”	6 1/8”	6 1/8”	125
57	3”	4”	L	600# x 150#	30”	6 1/8”	6 1/8”	125
58	4”	6”	L	600# x 150#	42”	7 1/16”	7 1/8”	195
59	4”	6”	L	600# x 150#	42”	7 1/16”	8”	195
60	4”	6”	L	900# x 300#	48”	7 1/16”	8 3/4”	210
61	4”	6”	L	1500# x 150#	48”	7 1/16”	8 3/4”	230
62	4”	6”	M	150# x 150#	38”	7”	7 1/4”	160
63	4”	6”	M	300# x 150#	38”	7”	7 1/4”	160
64	4”	6”	M	600# x 150#	49”	7”	8”	210
65	4”	6”	M	900# x 150#	49”	7”	8”	230
66	4”	6”	N	150# x 150#	37”	7 3/4”	8 1/4”	160
67	4”	6”	N	300# x 150#	37”	7 3/4”	8 1/4”	160
68	4”	6”	N	600# x 150#	42”	7 3/4”	8 1/4”	200
69	4”	6”	N	900# x 150#	42”	7 3/4”	8 1/4”	210
70	4”	6”	P	150# x 150#	37”	7 1/8”	9”	160
71	4”	6”	P	300# x 150#	42”	8 7/8”	10”	195
72	4”	6”	P	600# x 150#	49”	8 7/8”	10”	210
73	4”	6”	P	900# x 150#	49”	8 7/8”	10”	230
74	6”	8”	Q	150# x 150#	46”	9 7/16”	9 1/2”	300
75	6”	8”	Q	300# x 150#	54”	9 7/16”	9 1/2”	365
76	6”	8”	Q	600# x 150#	62”	9 7/16”	9 1/2”	365
77	6”	8”	R	150# x 150#	48”	9 7/16”	9 1/2”	295
78	6”	8”	R	300# x 150#	48”	9 7/16”	9 1/2”	295
79	6”	10”	R	300# x 150#	52”	9 7/16”	10 1/2”	425
80	6”	10”	R	600# x 150#	62”	9 7/16”	10 1/2”	425
81	8”	10”	T	150# x 150#	54”	10 7/8”	11”	510
82	8”	10”	T	300# x 150#	58”	10 7/8”	11”	550

Note : All dimensions are for estimation only. Certified drawing will be supplied upon request. * Marked orifice is not as per API standard.

Series 9000

De-codification System

9	0	0			0	Prefix
Series	Inlet Size	Orifice			Outlet Size	
Designates Conventional Full Lift Full Nozzle Safety Relief in Forged steel construction	Designates Inlet Size of Safety Relief valve	Orifice Designation	Area in Sq. Inch	Area in Sq. mm	Designates outlet Size of Safety Relief valve	Designates approval certificate
	$^{1}/_{2}$"	D	0.110	71	$^{1}/_{2}$"	IBR
	$^{3}/_{4}$"	E	0.196	126	$^{3}/_{4}$"	Non - IBR
	1"	F	0.307	198	1"	
	$1^{1}/_{2}$"	G	0.503	325	$1^{1}/_{2}$"	
	2"	H	0.785	506	2"	
					3"	

General Information

- Full Lift Full Nozzle Safety Relief Valves in Forged Steel Construction.
- Pressure setting up to 140 kg/cm2 (g) and temperature 538 Deg C.
- Trim tuned from bar – stock for process and general applications involving steam, air, gas or liquid on equipment or system where compliance with ASME section I or VIII.
- Available variety of materials constructions like carbon steel body & bonnet with SS trim, SS 304 body & bonnet with SS trim & SS 316 body & bonnet with SS trim.
- Orifice shall be as per Standard API 526.
- Guide bushing and seating surfaces of disc and seat are stellited to resist corrosion, erosion by abrasion, galling and sticking.
- This is a range of small bore high Performance safety relief valves available with screwed inlet and outlet or flanged inlet – screwed outlet connections. These valves are usually supplied with a plain screwed cap. Also a special model with pressure Range up to 400 kg/cm^2 depending on valve size.
- Bonnet Constructed from bar is a closed type (tight towards Atmosphere) vented through a hold at the guide to the outlet of the Body. On request an open bonnet can be delivered when cooling of spring is needed.

Applications

- Steam Boilers and Generators.
- Air/Gas Compressors-reciprocating or rotary, portable or stationary.
- Pressure vessels-containing steam, air or non-hazardous gas including tanks, receivers, sterilizers and autoclaves.
- Pressure reducing valves – protection of the discharge or low pressure side of system.

Features

- Valve housing is heavy duty forged steel.
- Precision machined full nozzle surfaces provide stream line entry conditions for fluid flow.
- Corrosion eliminated with use of stainless steel having excellent creep properties at elevated temperatures.
- Forged construction guarantees strength and freedom from casting defects.
- Blowdown control ring offer easy adjustability for precise opening with minimum preopen or simmer and exact blowdown control.
- Ball bearing pivot between disc and spring corrects misalignment and compensates for spring side thrust. Every valve is 100% tested / inspected for pressure setting, blowdown and leakage.

Service Specifications

Adjusting of the set pressure:

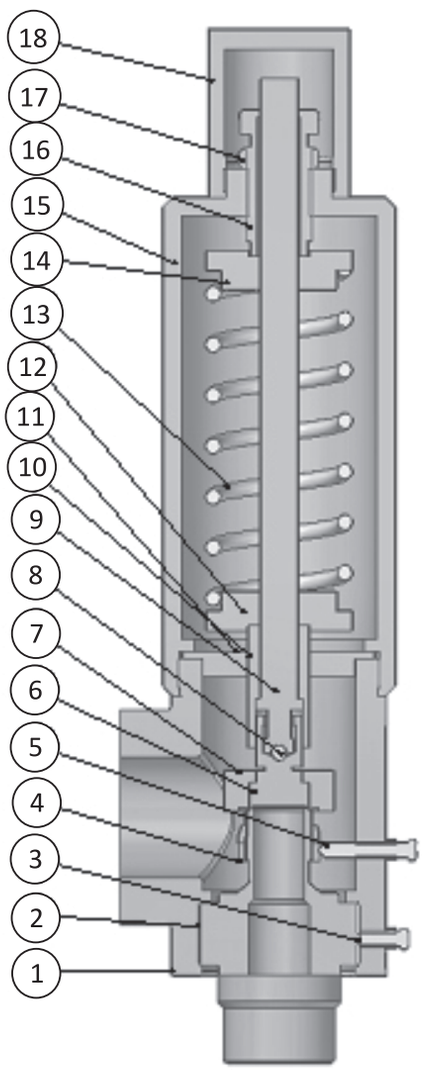
+ 10% per P set $\leq$ 17 Kg/cm2 (g).

+ 5% per P set >17 Kg/cm2 (g).

Minimum Set Pressure: 0.5 Kg/cm2 (g).

Overpressure: 10% of the set pressure (gas or steam) but not less than 0.2 kg/cm2 (g).

Part Detail



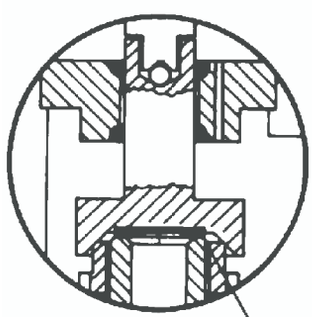
Sr. No.	Part Description
1	Body
2	Nozzle
3	Nozzle Pin
4	Blowdown Ring
5	Blowdown Ring Pin
6	Disc
7	Disc Holder
8	Ball
9	Stem
10	Bush
11	Guide Plate
12	Spring button (Lower)
13	Spring
14	Spring button (Upper)
15	Bonnet
16	Setting Screw
17	Lock Nut
18	Cap

Bill of Materials

Item Sr. No.	Item Description	General Service	Corrosive & Low Temperature Service
1	Body	A 216 Gr. WCB	A 351 Gr. CF8 / 8M
2	Bonnet	A 216 Gr. WCB	A 351 Gr. CF8 / 8M
3	Cap	A 216 Gr. WCB	A 351 Gr. CF8 / 8M
4	Nozzle	SS 316	SS 316
5	Nozzle Pin	Stainless Steel	Stainless Steel
6	Blowdown Ring	SS 316	SS 316
7	Blowdown Ring Pin	Stainless Steel	Stainless Steel
8	Disc	SS 316	SS 316
9	Disc Holder	SS 316	SS 316
10	Ball	SS	SS
11	Guide Plate	SS 316	SS 316
12	Stem	SS 316	SS 316
13	Spring Button (Lower)	Stainless Steel	Stainless Steel
14	Spring	Stainless Steel	Stainless Steel
15	Spring Button (Upper)	Stainless Steel	Stainless Steel
16	Setting Screw	Stainless Steel	Stainless Steel
17	Lock Nut	Stainless Steel	Stainless Steel
18	Bush	Stainless Steel	Stainless Steel
19	Lead Seal	Lead	Lead
20	Seal Wire	SS	SS

Standard trim material is stainless steel stellited. Overlay trim consists of those valve parts that come in contact with the flowing media. On safety relief valve stellite hard facing includes the seat ring, disc, guide post and guide bushing. Deposits are welded on the critical wearing surfaces of valve components, prior to final machining to increase their resistance to corrosion, erosion by abrasion, galling and sticking. Stellite facing on the disc to seat joint will maintain a tight seal.

Teflon disc insert to metal seat supplied in the case of moderate pressure to improve the valve tightness. It is limited to its range of temperature applications. Absolute limits are – 57 Deg C to + 180 Deg C and pressure upto 10.5 Kg/cm2 (g). For lower or higher temperatures all metal disc are to be used. The factory reserves to approve the applications.



SOFT SEATED DISC

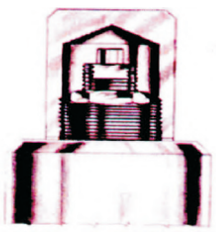
Overall Dimensions

Sr. No.	Inlet Size	Outlet Size	Orifice Designation	End Connection	Dimension in mm (Approx.)		
					Height A	Centre to Outlet Face B	Centre to Inlet Face C
1	1/2"	1"	D	BSP	260	75	45
2	3/4"	1"	E	BSP	300	85	50
3	1"	1 1/2"	F	BSP	340	105	60
4	1 1/2"	2"	G	BSP	340	105	64
5	2"	3"	H	BSP	475	165	90

Note:

- All dimensions are in mm & are to be used for estimation only. Certified drawing will be supplied upon request.
- Standard valves have N.P.T. threads but other threads can be supplied, if required. i.e. BSP (Parallel), DIN etc. Also can manufacture with socket weld, flanged end & butt weld.

Accessories



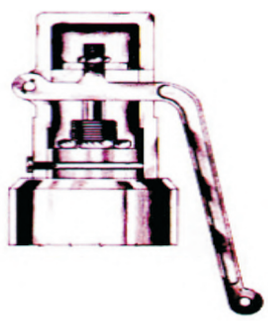
Cap Plain Screwed Type C - non liftable

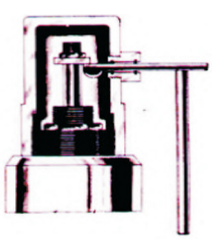
Gastight if used with closed bonnet.

For inflammable and / or toxic gases and liquids or for valves where for operational reasons lifting is not possible.

Plain Lifting Lever Type L - non gastight

For non-inflammable and / or non - toxic gases and vapours.
Typical application – Steam.
On valve blow - off or on lifting of disc, small quantities of fluid may leak to atmosphere.
This lifting gear may be combined with open bonnet for additional cooling of the spring at higher temperatures.



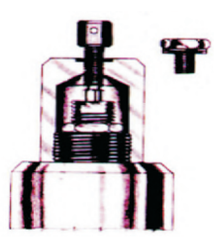


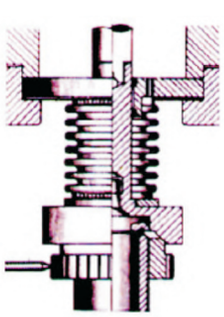
Packed Lifting Lever Type P - gastight

For inflammable and / or toxic gases and liquids.
Test lifting of the disc requires that safety valve is subject to at least 85% of the set pressure.

Test Gag Type T

The gag may be screwed in the top of the cap to locate on the valve stem and its purpose is to keep the valve closed at pressures above the set pressure during hydro testing of the plant. It is important that this gag is screwed only finger tight.

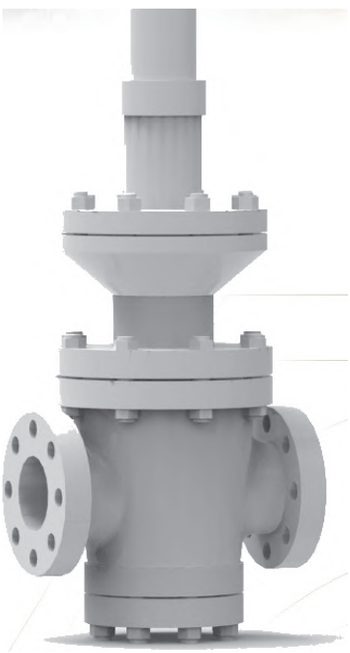




Valves with Balance Bellows

The stainless steel bellows provides balancing of back pressure, e.g. discharging in closed pipe system - in case of long discharge piping as well as to protect sliding parts and spring against failure and overheating.

Other Product

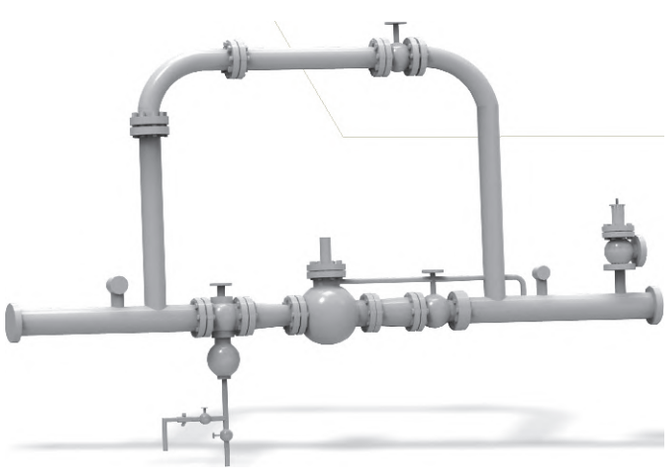


Self Acting Pressure Control Valve

- Pilot & Piston Operated self-actuated PRV controls the downstream pressure even though fluctuations in upstream pressure / flow rate.
- Suitable to use for Steam, Gas, Air & Liquid applications.
- Balanced design for enhanced accuracy.
- Instant response to changes in demand.
- interchangeable pilot valve assembly helps during maintenance and also to bring down inventory.
- Turn Down Ratio-10:1.
- IBR Approved.

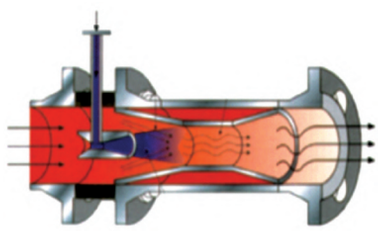
Pressure Reducing Station

- To obtain consistent & accurate required steam pressure at consumption point, our expert design & application team ensures to have proper sizing & selection of various components like Reformer, Pressure Reducing Valve, Outlet Isolation Valve, Bypass Valve, Safety Valve & other associated piping / fittings& components.
- Single Point Responsibility & performance guarantee.
- IBR Approved.

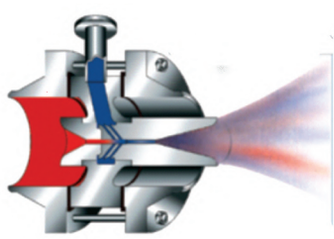


Other Product

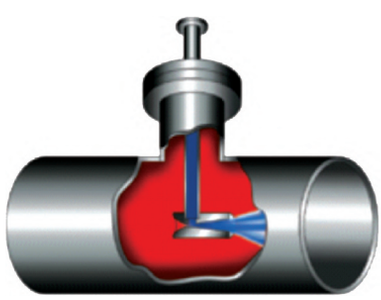
Double Venturi Desuperheater



Attemperator Desuperheater



In-line Venturi Desuperheater

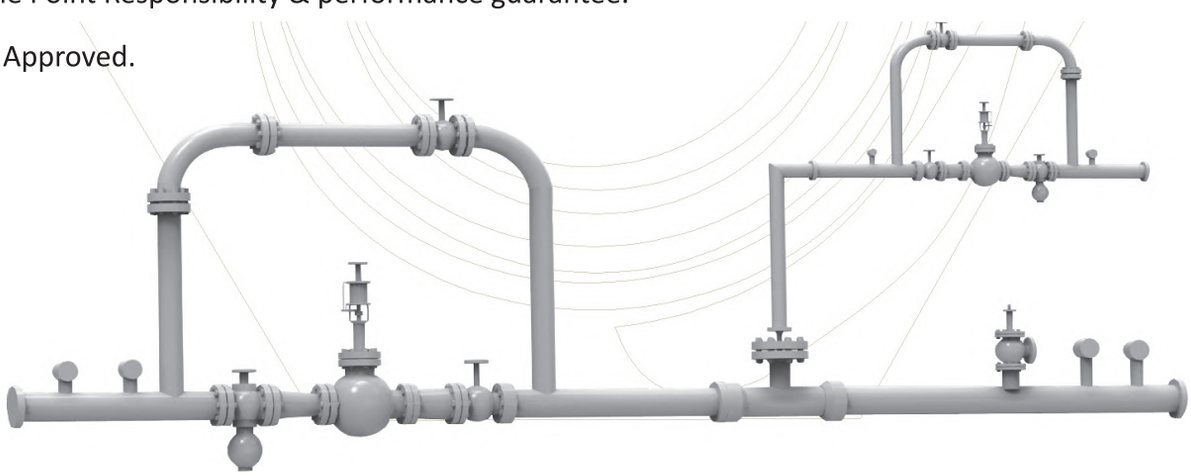


Desuperheater

- Different models of Desuperheater design like at temperature, In Line Venturi, Double Venturi are available to ensure a fine conical spray of water that evaporates within shortest distance in the steam flow to achieve steady conditions of steam temperature reached at all loads.
- To achieve high rate of evaporation expert & customized design ensures to break spray water droplets into very fine particles at all loads for almost instantaneous absorption so that true temperature can be measured within a shortest distance.
- The unique design is available where in spray water pressure is the same as steam pressure.
- Different model design having Turndown ratio starts from 2: 1 to 12 : 1.
- Consult factory for higher Turndown ratio.
- IBR Approved.

Pressure Reducing Cum Desuperheating Station

- By extending skill of selecting optimum solution of Pressure Reducing Station, our design team select suitable model of Desuperheater to cater different load requirement.
- Single Point Responsibility & performance guarantee.
- IBR Approved.



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