





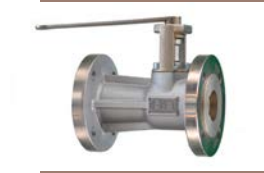
VALVE

---

ESHTEAL ARAK

INDUSTRIAL ENGINEERING CO.

<http://www.eshteal-arak.com>



# VALVE

---

GLOBE STOP VALVE

ES TSV

SFV 500

SSSV DSSV

SFV 600

H SERIES

WLC

ALLG

MLLG

FEED CHECK VALVE

AIR & TESTER VALVE

BLOW DOWN VALVE

BV 20

## Boiler Globe Stop Valve

### Description

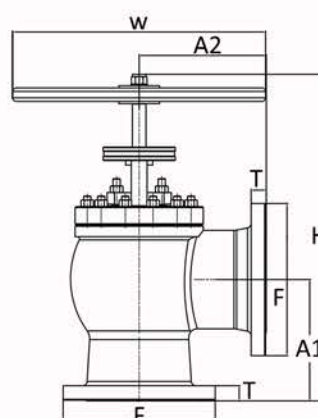
The valves in this range are ideally suitable for boiler stop valve and also general purpose stop/regulating valve duties. The combination of simple design, high quality materials, and high standard of production results in an easily maintained valve, capable of long and efficient service under high load conditions.



### Sizes and pipe connections

Size	Flanges dimensions					A1	A2	W	H (open)
	BS 10 table F & table H								
	F	T	N	O	P				
2 ½"	184	20	8	18	146	148	148	175	358
3"	203	22	8	18	165	155.5	180	175	414
4"	228	25	8	18	190	199	206	199	465
5"	280	25	8	22	235	222	228	230	546
7"	337	28	12	22	292	265	279	557	698
8"	368	30	12	22	324	278.5	276	557	758
10"	432	41	12	25	380	348	366	557	889.5
14"	550	38	12	25	495	425	425	557	1397

Dimensions are approximate and in mm.



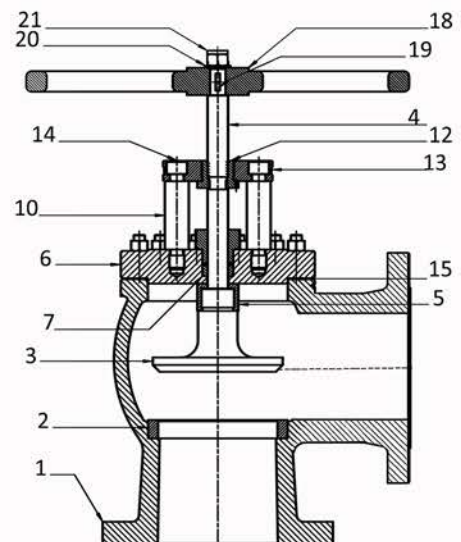
### Limiting Conditions

Body mat.	Temperature(°C)	-10 to 120	150	180	200	220	250	260
Cast iron	Pressure (bar)	16	16	16	13.5	11.3	8	7
Cast steel	Pressure (bar)	40	38.5	34	30	25.5	19.5	17.5

## Boiler Globe Stop Valve

### Material

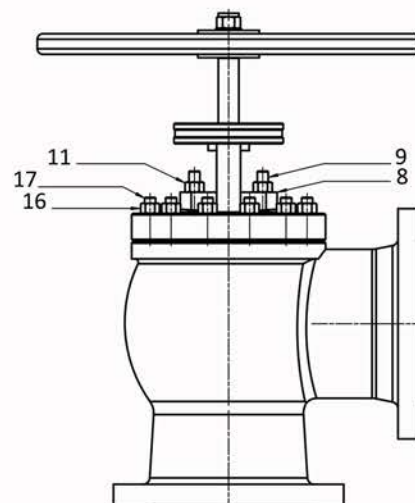
Num.	Part Name	Material	
1	Body	Cast steel A216-WCB	Cast Iron (GG25)
2	Seat ring	Stainless steel	
3	Disk	Bronze	
4	Stem	Stainless steel	
5	Disk nut	Brass	
6	Bonnet	ST52	
7	Packing	PTFE	
8	Gland flange	Bronze	
9	Gland flange stud	Steel	
10	Yoke pedestal	ST37	
11	Gland flange nut	Steel	
12	Yoke bushing	Brass	
13	Yoke	ST52	
14	Yoke screw	Steel	
15	Gasket	Compress fiber with binder	
16	Bonnet nut	Steel	
17	Bonnet stud	Steel	
18	Hand wheel	Cast iron (GG25)	
19	Hand wheel woodruff key	Steel	
20	Hand wheel washer	Steel	
21	Hand wheel nut	Steel	
22	Serial No. plaque	Stainless steel	



### How to order

connection size

working pressure & temperature: (bar,C)



## Globe Stop Valve 3/8"

### Description

This valve has a simple design and suitable construction for reliable performance over long periods is working.

### Applications

In the boilers this valve used as the main valve on the way of pressure switch.

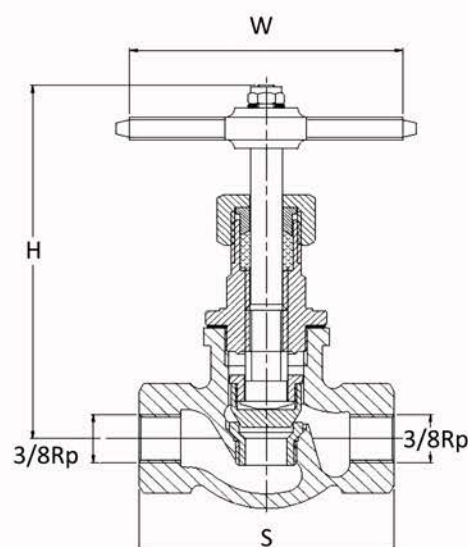


### Sizes and pipe connections

Dimensions are approximate and in mm.

Connections: Screwed

Connection	W	H	S
3/8" Rp	∅ 90	135	84



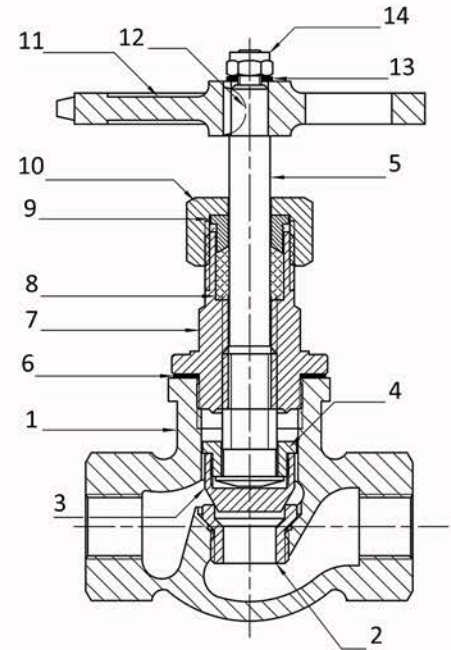
### Limiting Conditions

Pressure(bar)	24
Temperature(°C)	Steam at saturated tem.

## Globe Stop Valve 3/8"

### Material

Num	Part name	Material
1	Body	Bronze
2	Seat Ring	Stainless Steel
3	Disk	Stainless Steel
4	Disk Nut	Brass
5	Stem	Brass
6	Washer	Copper
7	Stem Bushing	Brass
8	Packing	PTFE
9	Packing flange	Brass
10	Stem Bushing Nut	Brass
11	Hand Wheel	Cast iron (GG25)
12	Woodruff key	Steel
13	Washer	Steel
14	Nut	Steel



### Installation

- install on the way of boiler pressure switch.
- the valve is always open.

### How to order

#### Connections

working pressure & temperature (bar g),(C)

## Pressure Relief Valve

### Description

ES TSV is a relief valve with have full nozzle design in standard .The max. allowable back pressure in liquid applications is 70% of set pressure; in vapor and gas applications is 50% and for liquid thermal relief applications is 90% of set pressure. max. back pressure rating is 400 psig (27.58 bar g). ES TSV is designed according to ASME sec 8.

### Applications

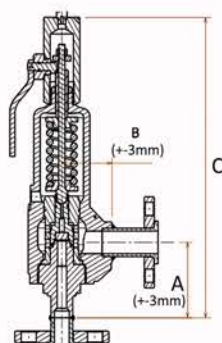
ES TSV is suitable for:

Boilers and pressure vessels acc. to ASME sec 8.

### Sizes and Limiting Conditions

Specification- Flanged Connection

Series ES with orifice 0.07 in<sup>2</sup> (47.7 mm<sup>2</sup>)



Valve style	Connection size (in)		Std. ANSI Lap Joint stub End Flanges		Max set pressure at 37.8°C		Max outlet pressure		Approx. Dimension (mm)			Approx. weight (kg)
	inlet	outlet	inlet	outlet	psig	barg	psig	barg	A	B	C	
ES 131	¾"	1"	150	150	285	19.65	285	19.65	117	121	371	8
ES 132	¾"	1"	300	150	740	51.02	285	19.65	117	121	371	9
ES 133	¾"	1"	600	150	1480	102.04	285	19.65	117	121	371	9
ES 134	¾"	1"	1500	300	1500	103.44	400	27.58	143	127	397	11

Specification- Flanged Connection

Series ES with orifice 0.11 in<sup>2</sup> (70.96 mm<sup>2</sup>)

Valve style	Connection size (in)		Std. ANSI Lap Joint stub End Flanges		Max set pressure at 37.8°C		Max outlet pressure		Approx. Dimension (mm)			Approx. weight (kg)
	inlet	outlet	inlet	outlet	psig	barg	psig	barg	A	B	C	
ES 231	¾"	1"	150	150	285	19.65	285	19.65	117	121	371	8
ES 232	¾"	1"	300	150	740	51.02	285	19.65	117	121	371	9
ES 233	¾"	1"	600	150	1480	102.04	285	19.65	117	121	371	9
ES 234	¾"	1"	1500	300	1500	103.44	400	27.58	143	127	397	11

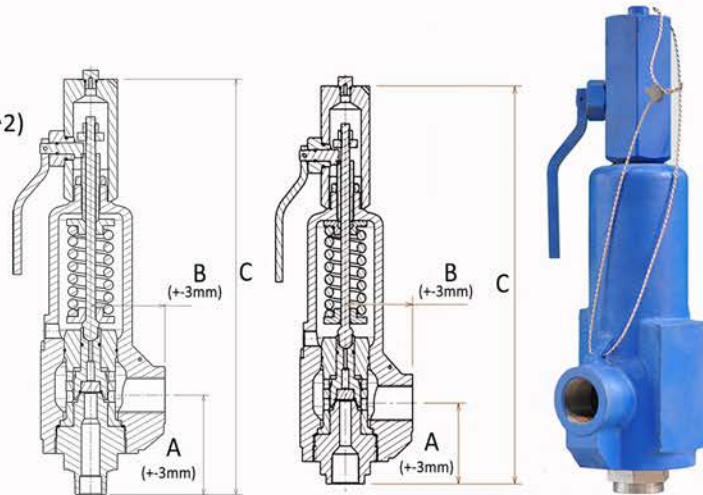
Dimensions are approximate and in mm.



## Pressure Relief Valve

Threaded connection : NPT

serie ES with orifice 0.074 in<sup>2</sup> (47.7 mm<sup>2</sup>)



Valve style	Connection size (in)		Min set pressure		Max set pressure		Max outlet pressure		Temperature range(°c)	Approx. Dimension (mm)			Approx. weight (kg)
	inlet	outlet	psig	barg	psig	barg	psig	barg		A	B	C	
ES 13M	inlet	outlet	psig	barg	psig	barg	psig	barg	-28/+204	86	64	340	6
	¾"	1"	50	3.45	1500	103.44	400	27.58					
ES 13F	inlet	outlet	psig	barg	psig	barg	psig	barg	-28/+204	70	64	324	6
	¾"	1"	50	3.45	1500	103.44	400	27.58					

Threaded connection : NPT

serie ES with orifice 0.11 in<sup>2</sup> (70.96 mm<sup>2</sup>)

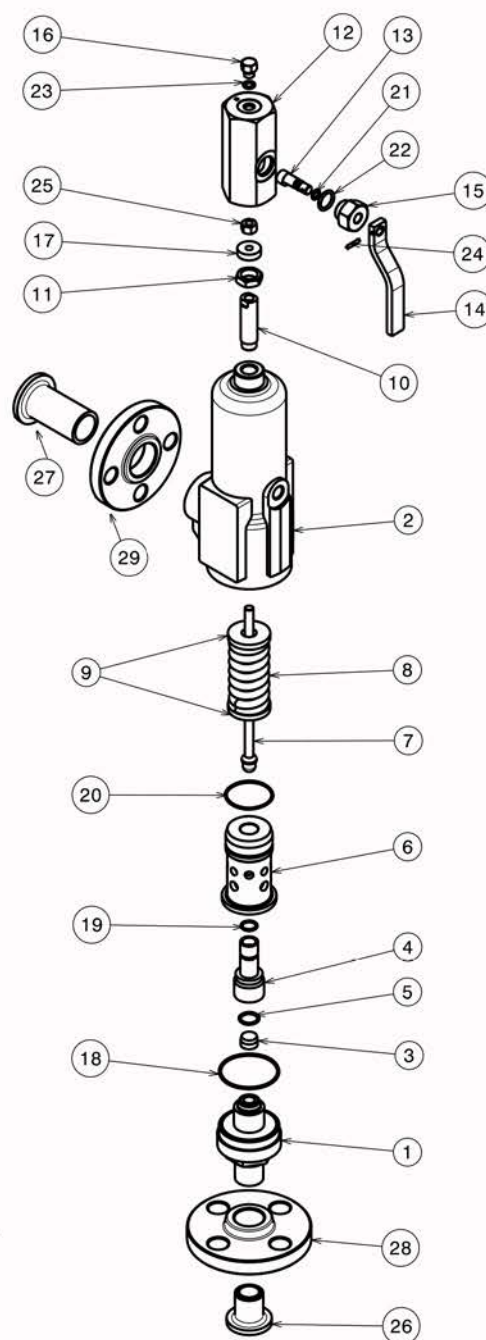
Valve style	Connection size (in)		Min set pressure		Max set pressure		Max outlet pressure		Temperature range(°c)	Approx. Dimension (mm)			Approx. weight (kg)
	inlet	outlet	psig	barg	psig	barg	psig	barg		A	B	C	
ES 23M	inlet	outlet	psig	barg	psig	barg	psig	barg	-28/+204	86	64	340	6
	¾"	1"	50	3.45	1500	103.44	400	27.58					
ES 23F	inlet	outlet	psig	barg	psig	barg	psig	barg	-28/+204	70	64	324	6
	¾"	1"	50	3.45	1500	103.44	400	27.58					

Dimensions are approximate and in mm.

## Pressure Relief Valve

### Material

Num.	Part name	Material
1	Base	Stainless steel
2	Cylinder	Steel casting
3	Disk insert	Stainless steel
4	Disk holder	Stainless steel
5	O-Ring seat	Viton
6	Guide	Stainless steel
7	Spindle	Stainless steel
8	Spring	Stainless steel
9	Spring Washer	Stainless steel
10	Adjustment bolt	Stainless steel
11	Adjustment bolt nut	Alloy steel
12	Cap	Alloy steel
13	Cam	Stainless steel
14	Lever	Alloy steel
15	Cam sleeve	Stainless steel
16	Cap plug	Alloy steel
17	Spindle nut	Alloy steel
18	O-Ring cylinder	Viton
19	O-Ring piston	Viton
20	O-Ring guide	Viton
21	O-Ring cam	Viton
22	O-Ring cam sleeve	Viton
23	O-Ring cap plug	Viton
24	Lever pin	Steel
25	Lock nut	Steel
26	Lap joint stub end (inlet)	Stainless steel
27	Lap joint stub end (outlet)	Alloy steel
28	Inlet flange	Alloy steel
29	Outlet flange	Alloy steel



Note: Numbers 26, 27, 28 and 29 are available in flange type.

## Pressure Relief Valve

### Capacities for water

in liters per minute at 21 C and 10% over pressure

Differential pressure Delta P (bar g)	Effective Area (mm <sup>2</sup> )		Differential pressure Delta P (bar g)	Effective Area (mm <sup>2</sup> )	
	47.74	70.96		47.74	70.96
10	94.9	141	60	232	345
20	134.2	199	76	261	389
30	164	244	94	291	432
50	212	315	112	317	472

delta p = inlt pressure - back pressure

### How to order

Connection type : MNPT\*FNPT - FNPT\*FNPT - 150RF\*150RF - 300RF\*150RF - 600RF\*150RF - 1500RF\*150RF

size : ¾" \* 1

working pressure & tempreture (barg),(C)

set pressure:---(barg)

condition of gas or liquid medium

## SFV 500 Safety Valve

### Description

The SFV500 is a full lift, full nozzle safety valve suitable for Steam, air, inert industrial gas and non-hazardous service. These valves have close bonnet, lifting lever and metal on metal seal. SFV500 is designed according to BS 6759 parts 1, 2 and 3.

### Applications

SFV500 is suitable for:  
steam or hot water boilers, vessels and general relief applications.

### Sizes and pipe connections

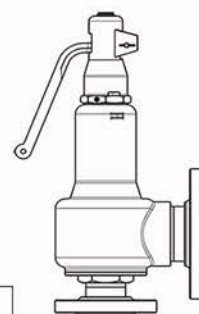
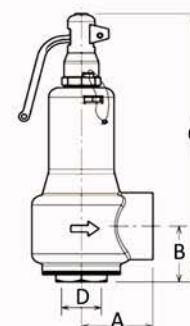
Screwed Connection in mm & Kg (approximate)							
Size	Connection		A	B	C	D	weight
	inlet	outlet					
DN 20	¾"	1-¼"	55	44	229	20	2.4
DN 25	1"	1-½"	60	48	242	24	2.9
DN 32	1-¼"	2"	70	58	279	29	4.2
DN 40	1-½"	2-½"	81	67	365	37	8.8
DN 50	2"	3"	96	80	420	46	13

Connections: Screwed and Flanged type

Dimensions are approximate and in mm.

### Limiting Conditions

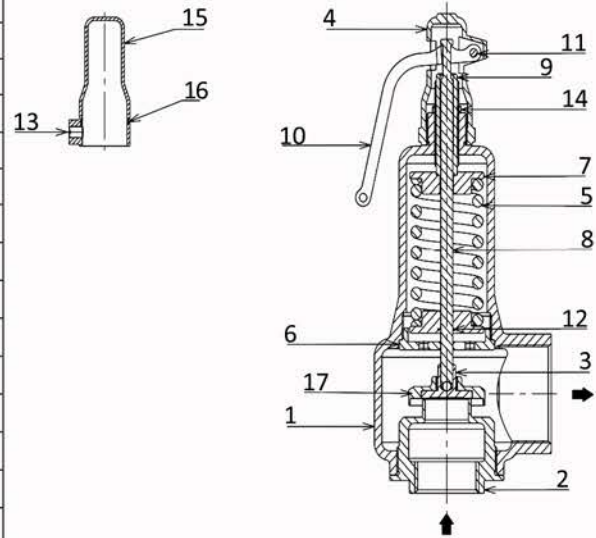
Body design	PN 25	
Set pressure range	DN 20 to DN32	0.3 to 18 bar
	DN40 and DN50	.3 to 14 bar
Temperature range	Stainless steel seat	-90°C to +300°C
Max. cold hydrostatic test pressure	38 bar	



## SFV500 Safety Valve

### Material

NUM.	Part name	Material
1	Body	Bronze
2	Nozzle	Stainless steel
3	Disk	Stainless steel
4	Lever housing	Bronze
5	Spring	Alloy steel
6	Steam guide	Brass
7	Spring end plate	Brass
8	Stem	Stainless steel
9	Adjustment screw	Brass
10	Lever	SG iron
11	Pivot pin	Stainless steel
12	Circlip	Stainless steel
13	Grub screw	Alloy steel
14	Adjuster lock nut	Brass
15	Gas tight cap	Bronze
16	Gas tight cap seal	Nit rile
17	Skirt	Brass



### Capacities for saturated steam

Valve DN	20/32	25/40	32/50	40/65	50/80
Area(mm <sup>2</sup> )	314	452	661	1 075	1 662
Set pressure (bar g)	flow capacity for saturated steam (kg/h)				
5.0	733	1 055	1 543	2 510	3 880
10	1 348	1 940	2 837	4 613	7132
15	1 962	2 824	4 130	-	-

### Installation

- the centre line of the spring housing should be vertically above the valve.
- the inlet connection to the valve should be as short as possible and no smaller in area than the flow diameter of the valve.
- the outlet pipe work should also be short, of a size no smaller in area than the valve outlet bore size.
- for steam or air service, discharge lines should rise vertically and should be fitted with drain.
- pipe work should be supported.

### How to order

size : DN 20,25,32,40,50

working pressure & temperature (bar g),(C)

set pressure:---(bar g)

condition of gas or liquid medium

## Single & Dual Spring Safety Valve

### Description

These high lift safety valves are our standard recommendation for shell boilers and other plant items with design pressure up to a max. 24 bar. this valves have open bonnet, lifting lever and polymeric seal. Discharge capacities in accordance with BS 6759 parts 1.

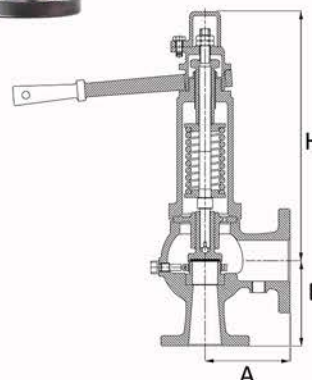
### Applications

Single and Dual spring safety valve are suitable for:  
steam or hot water systems.

### Sizes and pipe connections

Single spring safety valve

Dimensions are approximate and in mm.

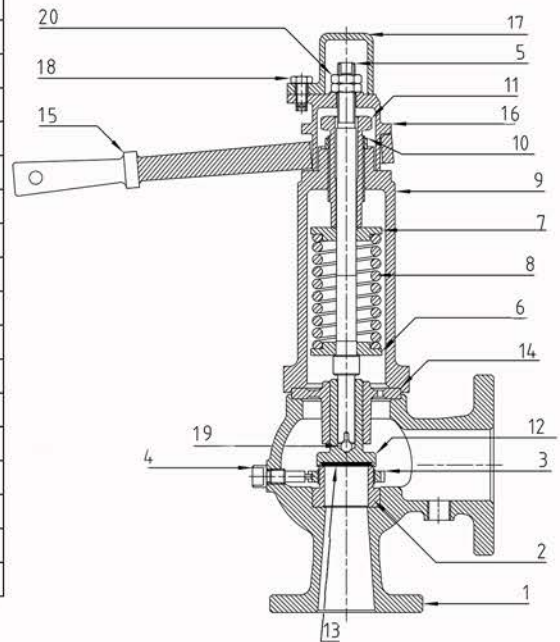


Inlet flange			Outlet flange			H	A	B
Flange standard type	Nominal size		Flange standard type	Nominal size				
Iron body B.S 10 Table F	1 ½	40	Table A	2 1/2	65	540	142	141
	2	50		3	80	570	145	145
	2 ½	65		4	100	630	150	140
	3	80		5	125	740	173	160
Iron body B.S4504 PN 16	1 ½	40	PN 6	2 1/2	65	540	142	141
	2	50		3	80	570	145	145
	2 ½	65		4	100	630	150	140
	3	80		5	125	740	173	160
Iron body B.S 1560 Class 150	2	50	Class 150	3	80	-	-	-
steel body B.S 10 Table H	1 ½	40	Table E	2 1/2	65	540	142	141
	2	50		3	80	600	145	145
	2 ½	65		4	100	630	150	140
	3	80		5	125	740	173	160
steel body B.S4504 PN 40	1 ½	40	PN 16	2 1/2	65	540	142	141
	2	50		3	80	600	145	145
	2 ½	65		4	100	630	150	140
	3	80		5	125	740	173	160
Steel body B.S 1560 Class 300	1 ½	40	Class 150	2 1/2	65	540	142	141
	2	50		3	80	600	145	145
	2 ½	65		4	100	630	150	140
	3	80		5	125	740	173	160

## Single & Dual Spring Safety Valve

### Material

Num.	Part Name	Material	
1	Body	Cast steel (A216-WCB)	Cast Iron (GG25)
2	Seat ring	Stainless steel	
3	Seat nut	Bronze	
4	Locking stud	Stainless steel	
5	stem	Stainless steel	
6	Bottom spring seat	ST37	
7	Upper spring seat	ST37	
8	Spring	Alloy steel	
9	Spring cover	Cast Iron (GG25)	
10	Fixed bushing	Brass	
11	Adjusting screw	Brass	
12	Disk	Stainless steel	
13	Packing	PTFE	
14	Disk bushing	Bronze	
15	Wrench	Cast Iron (GG25)	
16	Stem cover	Cast Iron (GG25)	
17	Locking cover	Cast iron (GG25)	
18	Locking screw	Steel	
19	Ball	Stainless steel	
20	Hexagon nut	Steel	



### Capacities of single spring safety valve for saturated steam

Single spring safety valve - Dry saturated steam

Set Pressure bar(gauge)	Size Nominal DN 40 - 1½" Kg/h	Size Nominal DN 50 - 2" Kg/h	Size Nominal "DN 65 - 2½" Kg/h	Size Nominal DN 80 - 3" Kg/h
2	781	1203	2062	3124
10	2930	4512	7734	11715
20	5615	8649	14823	22454

## Single & Dual Spring Safety Valve

### Description

These high lift safety valves are our standard recommendation for shell boilers and other plant items with design pressure up to a max. 24 bar. this valves have open bonnet, lifting lever and polymeric seal. Discharge capacities in accordance with BS 6759 parts 1.



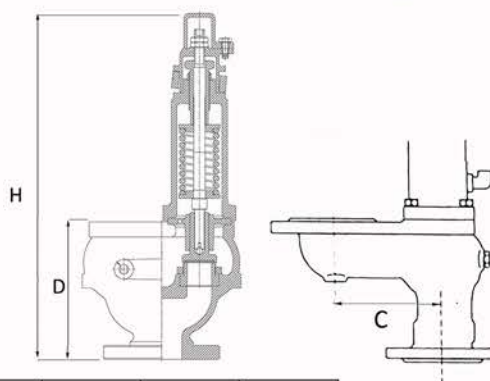
### Applications

Single and Dual spring safety valve are suitable for:  
steam or hot water systems.

### Sizes and pipe connections

Dual spring safety valve

Dimensions are approximate and in mm.



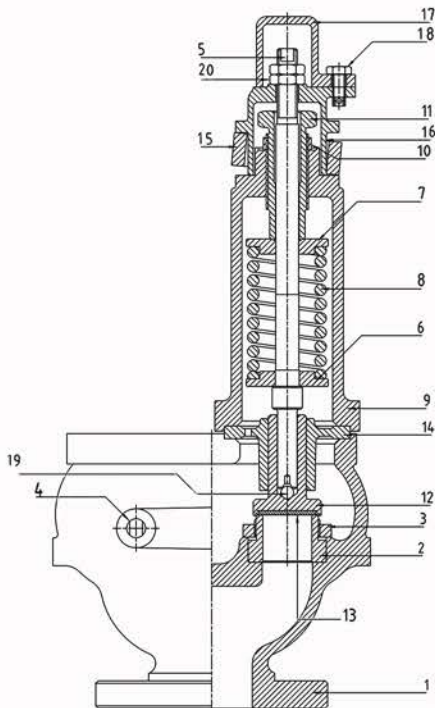
Flange standard type	Inlet flange			Outlet flange		App. C	App. D	App. H			
	Nominal size	Size		Size							
Iron body B.S 10 Table F	1 1/2"	K		E		165	220	550			
		IN	DN	IN	DN						
	2"	3	80	4"	100				185	242	610
	2 1/2"	4	100	5"	125				210	264	653
3"	5	125	6"	150	230	285	730				
Iron body B.S4504 PN 16	1 1/2"	2 1/2	65	3"	80	165	220	550			
	2"	3	80	4"	100	185	242	610			
	2 1/2"	4	100	5"	125	210	264	653			
	3"	5	125	6"	150	230	285	730			
Iron body B.S 1560 Class 150	1 1/2"	2 1/2	65	3"	80	165	220	550			
steel body B.S 10 Table H	1 1/2"	2 1/2	65	3"	80	165	220	550			
	2"	3	80	4"	100	177.5	252	620			
	2 1/2"	4	100	5"	125	210	275	664			
	3"	5	125	6"	150	230	285	730			
steel body B.S4504 PN 40	1 1/2"	2 1/2	65	3"	80	165	220	550			
	2"	3	80	4"	100	177.5	252	620			
	2 1/2"	4	100	5"	125	210	275	664			
	3"	5	125	6"	150	230	285	730			
Steel body B.S 1560 Class 300	1 1/2"	2 1/2	65	3"	80	165	220	550			

C : center to center



## Single & Dual Spring Safety Valve

### Material



Num.	Part Name	Material	
		Cast steel (A216-WCB)	Cast Iron (GG25)
1	Body	Cast steel (A216-WCB)	Cast Iron (GG25)
2	Seat ring	Stainless steel	
3	Seat nut	Bronze	
4	Locking stud	Stainless steel	
5	stem	Stainless steel	
6	Bottom spring seat	ST37	
7	Upper spring seat	ST37	
8	Spring	Alloy steel	
9	Spring cover	Cast Iron (GG25)	
10	Fixed bushing	Brass	
11	Adjusting screw	Brass	
12	Disk	Stainless steel	
13	Packing	PTFE	
14	Disk bushing	Bronze	
15	Wrench	Cast Iron (GG25)	
16	Stem cover	Cast Iron (GG25)	
17	Locking cover	Cast iron (GG25)	
18	Locking screw	Steel	
19	Ball	Stainless steel	
20	Hexagon nut	Steel	

### Capacities of dual spring safety valve for saturated steam

Dual spring safety valve - Dry saturated steam

Set Pressure bar(gauge)	Size Nominal DN 40 - 1½ Kg/h	Size Nominal DN 50 - 2" Kg/h	Size Nominal DN 65 - 2½ Kg/h	Size Nominal DN 80 - 3" Kg/h
2	1562	2440	4124	6248
10	5860	9151	15468	23431
20	11231	17540	29647	44909

## Single & Dual Spring Safety Valve

### Limiting Conditions

Body Material	Set pressure(Gage)	Temperature	Type of sealing	Single spring		Double spring	
				Flanged: BS 10	BS 4504 BS 1560	Flanged: BS 10	BS 4504 BS 1560
Cast iron BS 1452 Grade 220 (cast-on 'CI')	Up to 13 bar	Up to 220°C 428°F	polymeric	Flanged: BS 10	BS 4504 BS 1560	Flanged: BS 10	BS 4504 BS 1560
Cast steel to ASME Specification A216-WCB (cast-on 'WCB')	Up to 24 bar	Up to 224°C 435°F	polymeric	Flanged: BS 10	BS 4504 BS 1560	Flanged: BS 10	BS 4504 BS 1560

### Installation

- the centre line of the spring housing should be vertically above the valve.
- the inlet connection to the valve should be as short as possible and no smaller in area than the flow diameter of the valve.
- the outlet pipe work should also be short, of a size no smaller in area than the valve outlet bore size.
- for steam or air service, discharge lines should rise vertically and should be fitted with drain.
- having chosen the appropriate safety valve to suit the working conditions it is equally important to ensure that the mounting to the pressure vessel and the discharge pipe work are of the correct design, size and length.

### How to order

connections size

working pressure & temperature (bar g),(C)

set pressure:---(bar g)

condition of gas or liquid medium



## SFV 600 Safety Valve

### Description

The SFV600 is a full lift, semi nozzle, spring loaded safety valve.

Suitable for Steam, air and water; and there are capacity tables.

this valves have open bonnet, lifting lever and metal on metal seal.

SFV600 is according to EN ISO 4126.

### Applications

This safety valve is suitable for:

steam or hot water boilers, vessels and general relief applications.

ability to built up back pressure max. 10 % from set pressure (higher on request).



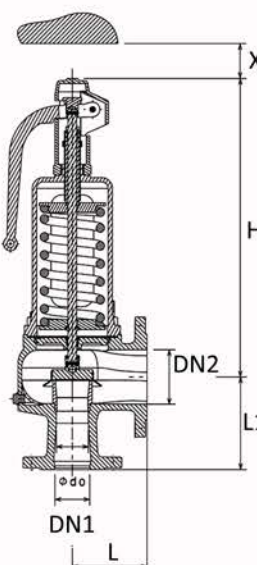
### Sizes and pipe connections

A0 is Area in mm<sup>2</sup>

DN1 ,DN2	25/40	40/65	50/80	65/100	80/125
d 0	22.5	36	45	58.5	72
A 0	398	1018	1590	2688	4072
I	100	115	120	140	160
I1	105	140	150	170	195
H	280	390	435	545	610
X	150	250	300	350	400
Weight	10	20	28	40	53

Dimensions are approximate and in mm.

Flange standards : BS 4504 PN16 , PN40  
BS 1560 Class 150 , Class 300



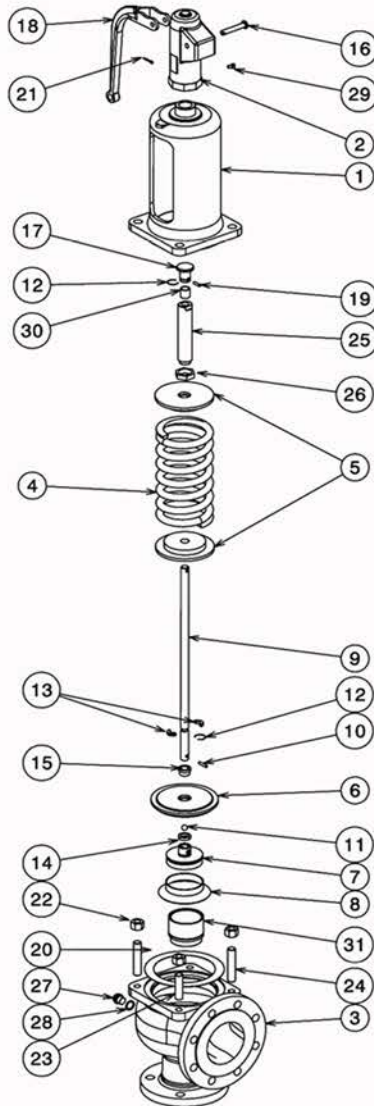
### Limiting Conditions

Intermediate values from max. permissible operational pressure can be determined by linear interpolation of the given temperature/ pressure chart.

Pressure in (bar)	Temperature	-10°C to 120°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C		
	material	Acc. to DIN EN 1092-2									
EN-JL1040	16	16	14.4	12.8	11.2	9.6	-	-	-		
EN-JS1049	40	40	38.8	36.8	34.8	32	28	-	-		
material	Acc. to manufactures standards										
1.0619+N	40	40	38.1	35	32	28	25.7	23.8	13.1		
Temperature		-29°C to 38°C	93°C	149°C	204°C	260°C	315°C	343°C	371°C	399°C	427°C
material	Acc. to ANSI										
SA 216 WCB	ANSI 150	19.6	17.9	15.8	13.8	11.7	9.6	8.6	7.6	6.6	5.5
SA 216 WCB	ANSI 300	51.1	46.6	45.2	43.8	41.4	39.3	37.9	36.6	34.8	28.3

## SFV600 Safety Valve

### Material



NUM.	Part name	Material	
1	Bonnet	Cast iron (GGG40)	
2	Cap	Cast iron (GGG40)	
3	Body	Size 3"	
		Other size	Cast iron (GG25)
		Cast steel (A216-WCB)	
4	Spring	Alloy steel	
5	Plug	Stainless steel	
6	Spindle guide	Cast iron (GG25)	
7	Disk	Stainless steel	
8	Cone	Stainless steel	
9	Spindle	Stainless steel	
10	Pin	Steel	
11	Ball	Stainless steel	
12	Spindle key	Stainless steel	
13	Bushing	Stainless steel	
14	Washer	Stainless steel	
15	Bushing	Stainless steel	
16	Pin	Alloy steel	
17	Pin	Stainless steel	
18	Lever	Cast iron (GGG40)	
19	Pin	Steel	
20	Gasket	Teflon packing	
21	Cotter pin	Steel	
22	Hexagon nut	Steel	
23	Stud	Steel	
24	Stud	Steel	
25	Adjusting screw	Stainless steel	
26	Lock nut	Stainless steel	
27	Screw	Stainless steel	
28	Washer	Copper	
29	Screw	Steel	
30	Bushing	PTFE	
31	Seal	Stainless steel	

## SFV600 Safety Valve

### Capacities for saturated steam & air

Capacity for saturated steam and air in 10% over pressure

Capacity saturated steam / air incl.10% overpressure											
Set pressure	Bar g	saturated steam (Kg/h)				Air 0°C and 1.013 bar a(Nm <sup>3</sup> /h)					
		DN25		DN40		DN50		DN65		DN80	
	0.2	126	148	324	380	506	594	855	1003	1295	1520
	0.4	185	223	473	570	739	891	1250	1505	1890	2280
	0.5	207	252	529	646	827	1009	1400	1705	2120	2585
	0.6	230	284	590	728	923	1135	1560	1920	2360	2910
	0.8	272	341	698	873	1090	1365	1840	2305	2790	3490
	1	317	398	811	1019	1270	1590	2140	2690	3245	4075
	1.5	425	538	1090	1378	1700	2150	2875	3640	4355	5510
	2	477	607	1220	1550	1900	2425	3220	4100	4880	6210
	2.5	572	731	1460	1870	2285	2925	3865	4945	5855	7490
	3	662	850	1695	2175	2645	3400	4475	5750	6775	8700
	4	837	1080	2140	2770	3350	4330	5650	7310	8570	11080
	5	1000	1300	2565	3330	4000	5210	6770	8800	10260	13340
	6	1165	1520	2990	3900	4665	6090	7890	10300	11950	15600
	7	1330	1745	3400	4465	5320	6970	9000	11790	13600	17860
	8	1495	1965	3820	5030	5980	7860	10100	13280	15300	20100
	9	1660	2185	4245	5590	6630	8740	11200	14770	16950	22370
	10	1820	2400	4665	6150	7290	9610	12300	16250	18650	24600
	11	1985	2625	5080	6720	7940	10500	13400	17750	20300	26900
	12	2150	2845	5500	7290	8590	11380	14500	19240	22000	2950
	13	2310	3070	5920	7850	9250	12270	15600	20730	23650	31400
	14	2475	3290	6340	8400	9900	13150	16700	22200	25350	33650
	15	2640	3500	6760	8980	10550	14030	17800	23700	27000	35900
	16	2800	3725	7170	9540	11200	14900	18950	25200	28700	38200
	17	2965	3950	7590	10100	11850	15800	20050	26700	30350	40400
	18	3130	4170	8010	10670	12500	16650	21150	28100	32050	42700
	19	3295	4390	8430	11240	13150	17550	22250	29600	33700	44900
	20	3460	4610	8850	11800	13800	18400	23350	31150	35400	47200
	21	3620	4830	9250	12370	14500	19300	24500	32650	37100	49400
	22	3790	5050	9700	12930	15150	20200	25600	34150	38800	51700
	24	4120	5490	10500	14060	16450	21970	27850	37100	42100	56200
	25	4280	5710	10950	14620	17100	22850	28950	38600	43800	58500
	26	4450	5930	11350	15190	17800	23730	30050	40100		
	28	4780	6370	12250	16320	19100	25500	32300	43100		
	30	5120	6810	13100	17450	20450	27250				
	32	5450	7250	13950	18570	21800	29000				
	34		7700		19700		30800				
	40		9030		23810		36100				

max. set pressure stainless steel version

## SFV600 Safety Valve

### Installation Certified coefficient of discharge kdr

Certified coefficient of discharge kdr:					
Kdr	DN25	DN40	DN50	DN65	DN80
D/G	0.74	0.74	0.74	0.74	0.74
F	0.54	0.54	0.54	0.48	0.48

### Installation

- the centre line of the spring housing should be vertically above the valve.
- the inlet connection to the valve should be as short as possible and no smaller in area than the flow diameter of the valve.
- the outlet pipe work should also be short, of a size no smaller in area than the valve outlet bore size.
- for steam or air service, discharge lines should rise vertically and should be fitted with drain.
- pipe work should be supported.

### How to order

size : DN 20,25,40,50,65,80

working pressure & temperature (bar g),(C)

set pressure:---(bar g)

condition of gas or liquid medium

## SFV 600 Safety Valve Size 4 inches

### Description

The SFV600 is a full lift, semi nozzle, spring loaded safety valve.

Suitable for Steam, air and water; and there are capacity tables.

this valves have open bonnet, lifting lever and metal on metal seal.

SFV600 is according to EN ISO 4126.

### Applications

This safety valve is suitable for:

steam or hot water boilers, vessels and general relief applications.

ability to built up back pressure max. 10 % from set pressure (higher on request).



### Sizes and pipe connections

A0 is Area in mm<sup>2</sup>

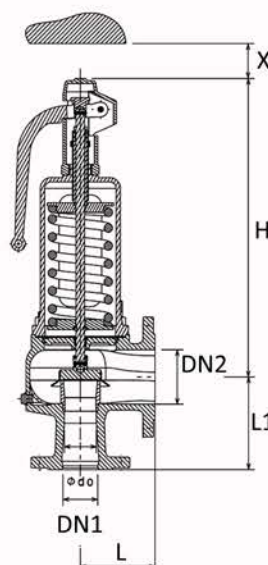
DN1 , DN2	100/150
d0	90
A0	6362
l	180
l1	220
H	696
X	500

Flange standards :

BS 4504 PN16 , PN40

BS 1560 Class 150 , Class 300

Dimensions are approximate and in mm.



### Limiting Conditions

Intermediate values from max. permissible operational pressure can be determined by linear interpolation of the given temperature/ pressure chart.

Pressure in (bar)	Temperature	-10°C to 120°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C		
	<b>material</b>	Acc. to DIN EN 1092-2									
EN-JL1040	16	16	14.4	12.8	11.2	9.6	-	-	-		
EN-JS1049	40	40	38.8	36.8	34.8	32	28	-	-		
<b>material</b>	Acc. to manufactures standards										
1.0619+N	40	40	38.1	35	32	28	25.7	23.8	13.1		
<b>Temperature</b>		-29°C to 38°C	93°C	149°C	204°C	260°C	315°C	343°C	371°C	399°C	427°C
<b>material</b>	Acc. to ANSI										
SA 216 WCB	ANSI 150	19.6	17.9	15.8	13.8	11.7	9.6	8.6	7.6	6.6	5.5
SA 216 WCB	ANSI 300	51.1	46.6	45.2	43.8	41.4	39.3	37.9	36.6	34.8	28.3



## SFV 600 Safety Valve Size 4 inches

### Capacities for saturated steam & air

Capacity for saturated steam and air in 10% over pressure

P (bar g)	2	5	11	15	20	24
Saturated steam (Kg/h)	7625	16000	31750	42200	55300	65900
Air (Nm <sup>3</sup> /h)	9700	20840	42000	56100	73700	87900

### Installation Certified coefficient of discharge kdr

Certified coefficient of discharge kdr	
Kdr	DN 100
D/G	0.74
F	0.48

### Installation

- the centre line of the spring housing should be vertically above the valve.
- the inlet connection to the valve should be as short as possible and no smaller in area than the flow diameter of the valve.
- the outlet pipe work should also be short, of a size no smaller in area than the valve outlet bore size.
- for steam or air service, discharge lines should rise vertically and should be fitted with drain.
- pipe work should be supported.

### How to order

size : DN 100

working pressure & temperature (bar g),(C)

set pressure:---(bar g)

condition of gas or liquid medium

## HCI Safety Valve - 38 bar

### Description

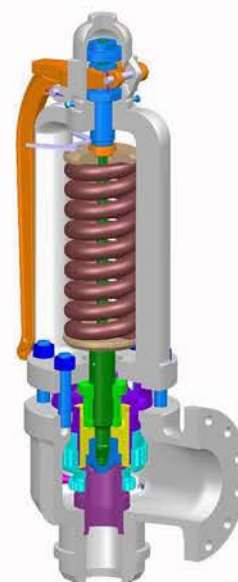
High capacity safety valve. Simple, rugged and reliable. Seat tightness at 96% set pressure. Ease of setting and adjustment is service with low maintenance. Minimizes inventory with interchangeable spare parts. Extends valve service life with higher nozzle seat step.

HCI safety valve is designed according to ASME, Sec.1

### Applications

HCI safety valve is suitable for:

Saturated and superheated steam systems.



### Sizes and pipe connections

Valve size inlet x orifice x outlet	HCI Valve style	Orifice area [sq. mm]	Set Pressure [PSIG]	Dimensions - [mm]				Approx. Height [mm]
				Inlet I.D.	Inlet Neck O.D.	Center to face of		
						Inlet	Outlet [Class 300]	
A	B	C	D	E				
4 P2 6	HCI-58W	4561.3	552	101.6	174.6	238.1	254	1163.6

Flange standard ANSI B16.5

Welded inlets: 4" (CL900)

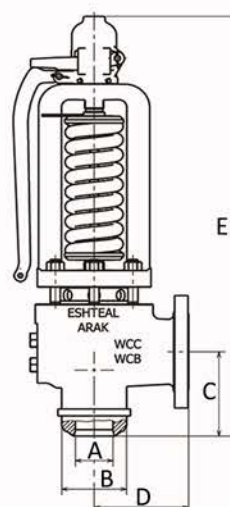
Outlet flange rating: 6" (CL300)

### Limiting Conditions

Design pressure up to 207 bar g

Design temperature up to 593 °C

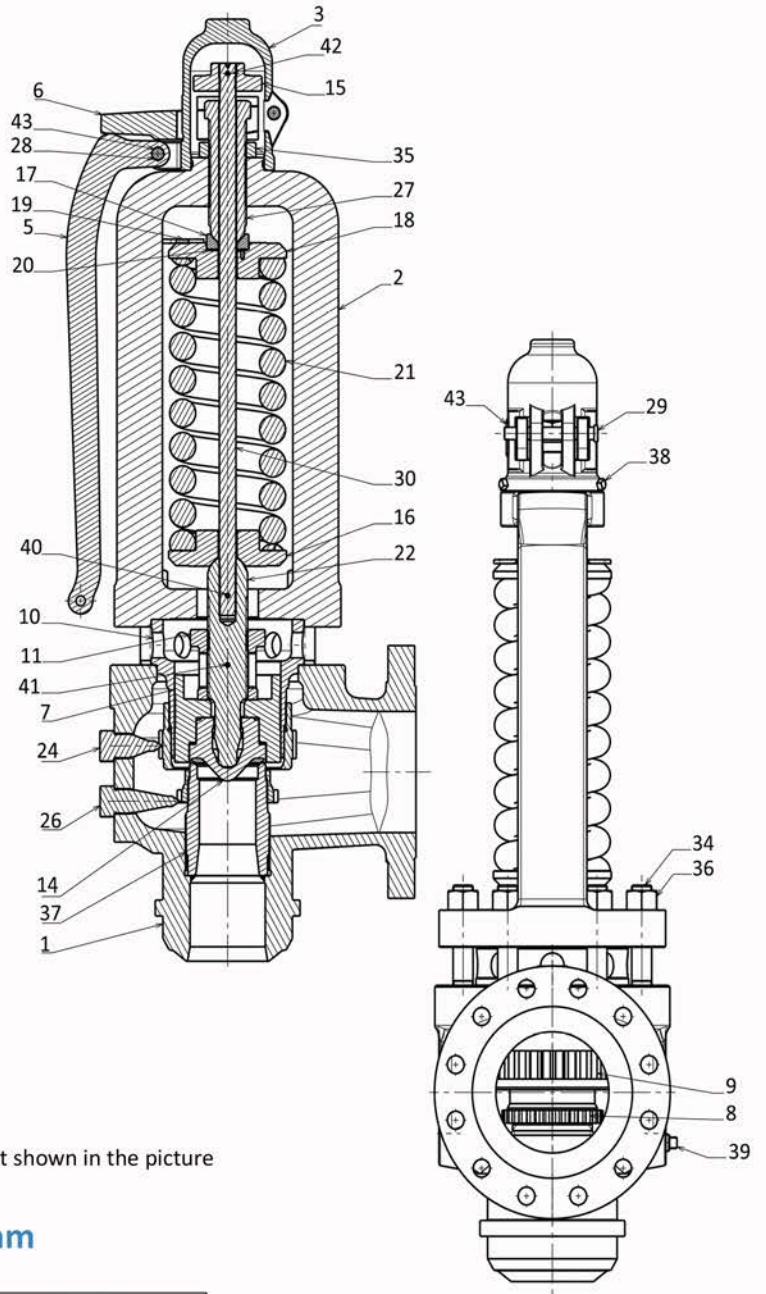
See the Chart.



## HCI Safety Valve - 38 bar

### Material

Item	Part Number	Material
1	Body	Carbon steel SA-216 Gr.WCC
2	Bonnet	Alloy steel SA-216 Gr.WCC
3	Cap	Steel
4	Test lever	Steel
5	Hand lever	Steel
6	Forked lever	Steel
7	Disc holder	Nickel alloy
8	Nozzle ring	Stainless steel
9	Guide ring	Stainless steel
10	Guide	Nickel alloy
11	Disc holder retaining nut	Stainless steel
12	back-up ring	Viton
13	Test plug	Stainless steel
14	Disc insert	Inconel
15	Spindel nut	Stainless steel
16	Bottom spring washer	Steel
17	Bearing adapter	Alloy steel
18	Top spring washer	Steel
19	Top spring washer pin	Steel
20	Thrust bearing	Steel
21	Spring	Alloy steel
22	Spindel(1)	Stainless steel
23	Test cap	Stainless steel
24	Guide Ring Set Screw	Stainless steel
25	Test lever screw	Stainless steel
26	Nozzle Ring Set Screw	Stainless steel
27	Adjusting screw	Stainless steel
28	Hand lever pin	Stainless steel
29	Forked lever pin	Stainless steel
30	Spindel(2)	Stainless steel
31	o-ring	Viton
32	Bottom spring washer pin	Stainless steel
33	Plug pin	Stainless steel
34	Bonnet stud	Alloy steel SA-193 Gr.B7
35	Adjusting bolt nut	Stainless steel
36	Bonnet stud nut	Steel SA-194 Gr.2H
37	Nozzle	Stainless steel
38	Cap bolt	Steel
39	Drain plug	Stainless steel
40	Spindel pin	Stainless steel
41	Split pin	Stainless steel
42	Split pin	Stainless steel
43	Split pin	Stainless steel



Numbers. 4,12,13,23,25,31,32 and 33 are not shown in the picture

### Capacities for saturated steam

Set pressure (psi g)	552
Saturated steam capacity ( lit/h)	186459

### How to order

connections Size

Set pressure : (bar g)

Working pressure and temperature:(bar g , C)

## HCI Safety Valve - 181.5 bar

### Description

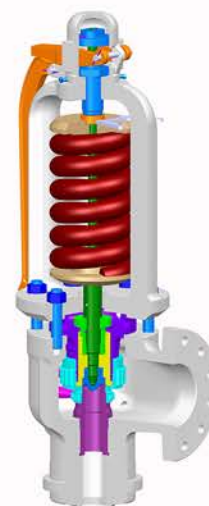
High capacity safety valve. Simple, rugged and reliable. Seat tightness at 96% set pressure. Ease of setting and adjustment is service with low maintenance. Minimizes inventory with interchangeable spare parts. Extends valve service life with higher nozzle seat step.

HCI safety valve is designed according to ASME, Sec.1

### Applications

HCI safety valve is suitable for:

Saturated and superheated steam systems.



### Sizes and pipe connections

Valve size inlet x orifice x outlet	HCI Valve style	Orifice area [sq. mm]	Set Pressure [PSIG]	Dimensions - [mm]				Approx. Height [mm]
				Inlet I.D.	Inlet Neck O.D.	Center to face of		
						Inlet	Outlet [Class 300]	
A	B	C	D	E				
3 M2 6	HCI-98W	2565.2	2630	76.2	203.2	304.8	254	1231.9

Flange standard ANSI B16.5

Welded inlets: 3" (CL2500)

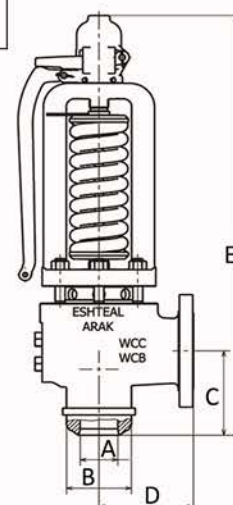
Outlet flange rating: 6" (CL300)

### Limiting Conditions

Pressure up to 207 bar g

Temperature up to 593 °C

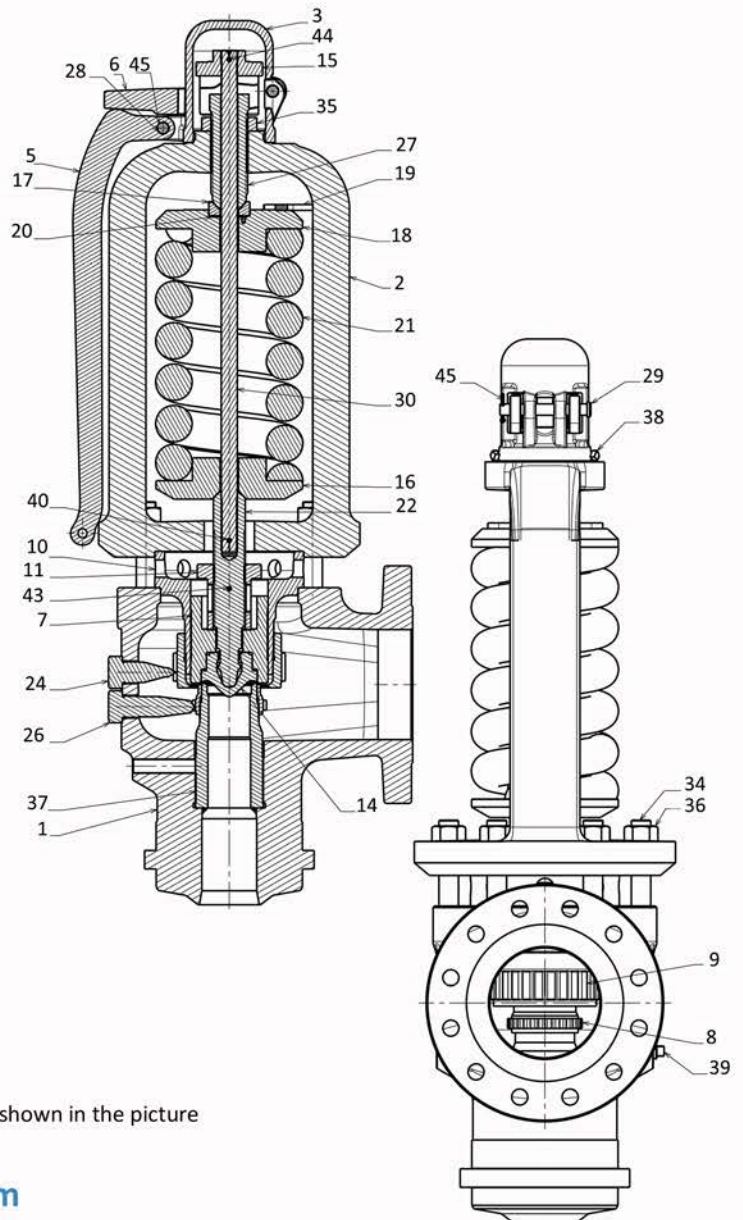
See the chart.



## HCI Safety Valve - 181.5 bar

### Material

Item	Part Number	Material
1	Body	Carbon steel SA-216 Gr.WCC
2	Bonnet	Alloy steel SA-216 Gr.WCC
3	Cap	Steel
4	Test lever	Steel
5	Hand lever	Steel
6	Forked lever	Steel
7	Disc holder	Nickel alloy
8	Nozzle ring	Stainless steel
9	Guide ring	Stainless steel
10	Guide	Nickel alloy
11	Disc holder retaining nut	Stainless steel
12	back-up ring	Viton
13	Test plug	Stainless steel
14	Disc insert	Inconel
15	Spindel nut	Stainless steel
16	Bottom spring washer	Steel
17	Bearing adapter	Alloy steel
18	Top spring washer	Steel
19	Top spring washer pin	Steel
20	Thrust bearing	Steel
21	Spring	Alloy steel
22	Spindel(1)	Stainless steel
23	Test cap	Stainless steel
24	Guide Ring Set Screw	Stainless steel
25	Test lever screw	Stainless steel
26	Nozzle Ring Set Screw	Stainless steel
27	Adjusting screw	Stainless steel
28	Hand lever pin	Stainless steel
29	Forked lever pin	Stainless steel
30	Spindel(2)	Stainless steel
31	o-ring	Viton
32	Bottom spring washer pin	Stainless steel
33	Plug pin	Stainless steel
34	Bonnet stud	Alloy steel SA-193 Gr.B7
35	Adjusting bolt nut	Stainless steel
36	Bonnet stud nut	Steel SA-194 Gr.2H
37	Nozzle	Stainless steel
38	Cap bolt	Steel
39	Drain plug	Stainless steel
40	Spindel pin	Stainless steel
41	Split pin	Stainless steel
42	Split pin	Stainless steel
43	Split pin	Stainless steel



Numbers. 4,12,13,23,25,31,32 and 33 are not shown in the picture

### Capacities for saturated steam

Set pressure (psi g)	552
Saturated steam capacity ( lit/h)	186459

### How to order

connections Size

Set pressure : (bar g)

Working pressure and temperature:(bar g , C)

## HC Safety Valve - 69.1 bar

### Description

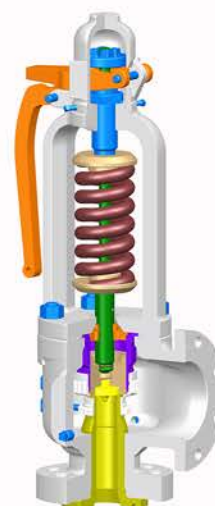
Style HC safety valves have been selected because of its performance features, reliability and ease of maintenance. It is a high capacity reaction type safety valve designed for saturated and superheated steam applications to temperature of 400 C.

HC safety valve is designed according to ASME, Sec.1

### Applications

HC safety valve is suitable for:

Saturated and superheated steam systems.



### Sizes and pipe connections

Valve size inlet x orifice x outlet	HC Valve style	Orifice area [sq.mm]	Set Pressure [PSIG]	Used to Find Bolt Length	Dimensions - [mm]			Approx. Height [mm]
					Inlet I.D.	Center to face of		
						Inlet [Class 1500]	Outlet [Class 150]	
				X	A	C	D	E
3 M 6	HC-57	2322.6	1004	67.5	76.2	222.3	190	975

Flange standard ANSI B16.5

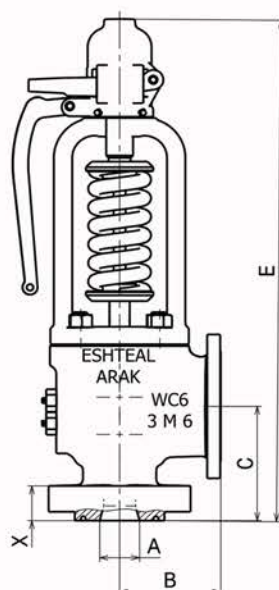
inlet flange rating: 3" (CL1500)

Outlet flange rating: 6" (CL150)

### Limiting Conditions

Temperature up to 400°C

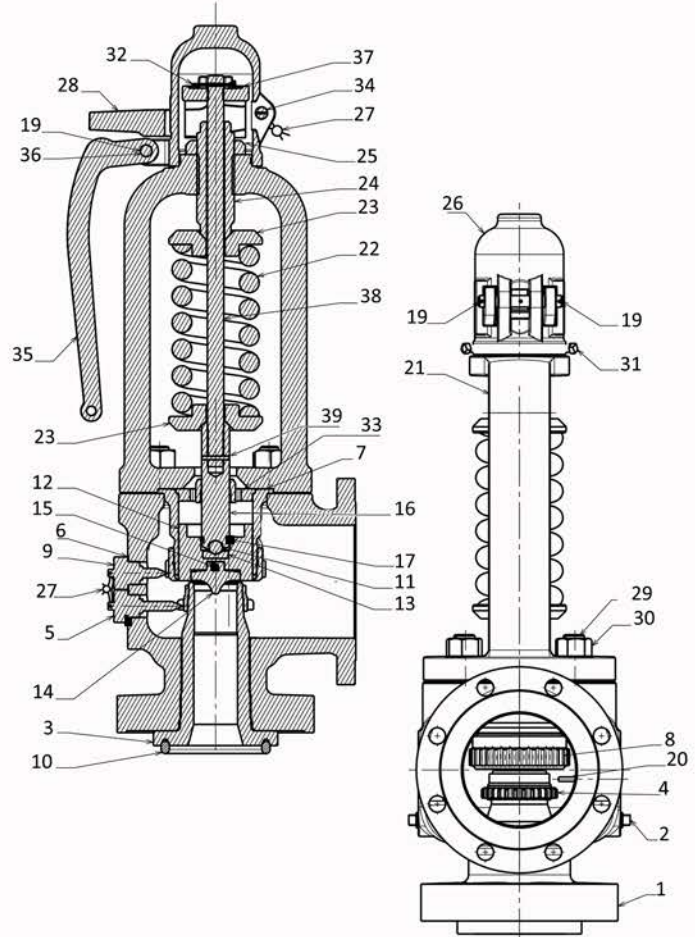
See the chart.



## HC Safety Valve - 69.1 bar

### Material

Num.	Part Name	Material
1	Body	Cast steel A217-WC6
2	Drain plug	Stainless steel
3	Nozzle	Stainless steel
4	Nozzle ring	Stainless steel
5	Nozzle ring set screw	Stainless steel
6	Set screw gasket	F.soft.steel
7	Guide	Stainless steel
8	Guide ring	Stainless steel
9	Guide ring set screw	Stainless steel
10	Ring	Stainless steel
11	Ball	Stainless steel
12	Disk holder	Monel Alloy
13	Disk bushing	Stainless steel
14	Disk insert	Stellite grade3
15	Disk insert cotter pin	Stainless steel
16	Spindle (1)	Monel Alloy
17	Spindle lock clip	Stainless steel
18	Protective bonnet	ST37
19	Cap cotter pins	Stainless steel
20	Guide ring stop pin	Stainless steel
21	Bonnet	Cast steel A217-WC6
22	spring	Alloy steel
23	Spring washer	Alloy steel
24	Adjusting screw	Stainless steel
25	Adjusting screw lock nut	Alloy steel
26	Cap	Cast steel A216-WCB
27	Seal	Lead
28	Forked lever	S.G. iron
29	Body studs(UNC1")	Alloy steel
30	Stud nuts(UNC1")	Alloy steel
31	Cap set screw M10	Stainless steel
32	Spindle nut cutter	Stainless steel
33	Guide aligner	Gunmetal
34	Forked lever pin	Stainless steel
35	Hand lever	ST52
36	Han lever pin	Stainless steel
37	Spindle nut	Alloy steel
38	Spindle (2)	Stainless steel
39	pin	Stainless steel



Number 18 is not shown in the picture

### Capacities for saturated steam

Set pressure (psi g)	1004
Saturated steam capacity ( lit/h)	62324

### How to order

connections Size

Set pressure : (bar g)

Working pressure and temperature:(bar g , C)

## HCA Safety Valve - 69.1 bar

### Description

Style HCA is a high temperature version of the style HC, with an alloy steel construction suitable to temperature up to 550 C.

HCA safety valve is designed according to ASME, Sec.1

### Applications

HCA safety valve is suitable for:  
super heaters and reheated outlets.



### Sizes and pipe connections

Valve size inlet x orifice x outlet	HCA Valve style	Orifice area [sq. mm]	Set Pressure [PSIG]	Used to Find Bolt Length	Dimensions - [mm]			Approx. Height [mm]
					Inlet I.D.	Center to face of		
						Inlet [Class 1500]	Outlet [Class 150]	
				X	A	C	D	E
3 M 6	HCA-57	2322.6	1004	67.5	76.2	222.3	190	1145

Flange standard ANSI B16.5

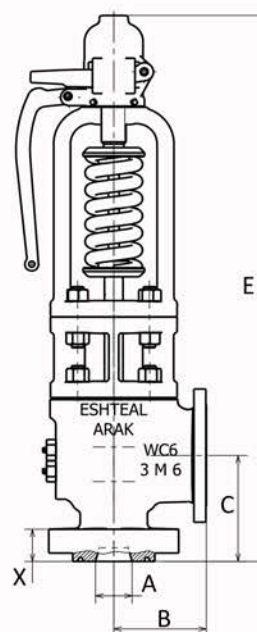
inlet flange rating: 3" (CL1500)

Outlet flange rating: 6"(CL150)

### Limiting Conditions

Temperature up to 550°C

See the chart.



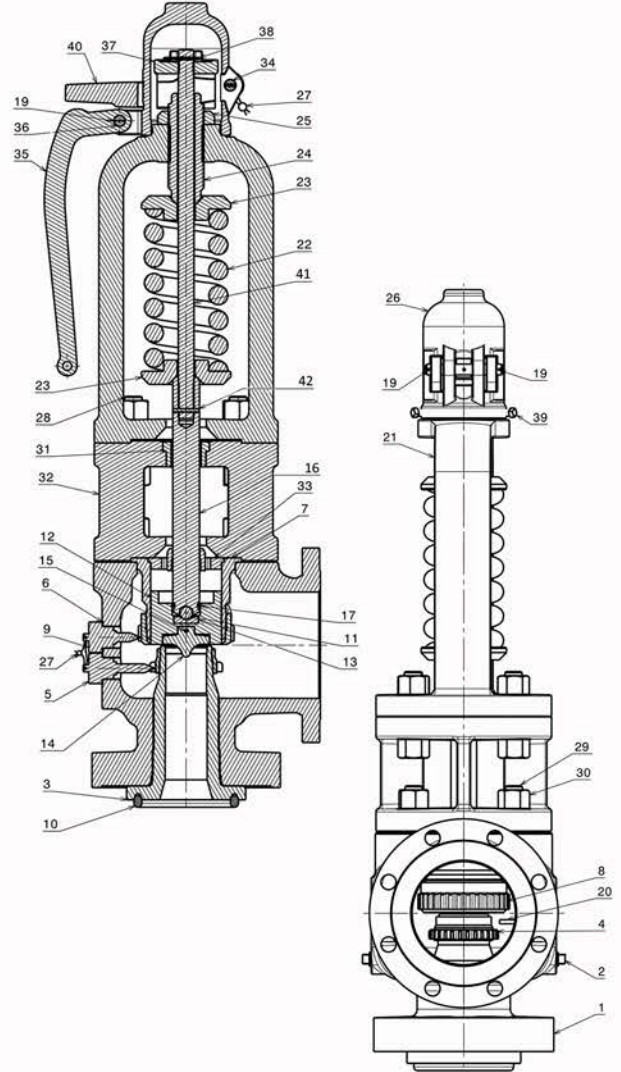


## HCA Safety Valve - 69.1 bar

### Material

Num.	Part Name	Material
1	Body	Cast steel A217-WC6
2	Drain plug	Stainless steel
3	Nozzle	Stainless steel
4	Nozzle ring	Stainless steel
5	Nozzle ring set screw	Stainless steel
6	Set screw gasket	F.soft.steel
7	Guide	Stainless steel
8	Guide ring	Stainless steel
9	Guide ring set screw	Stainless steel
10	Ring	Stainless steel
11	Ball	Stainless steel
12	Disk holder	Monel Alloy
13	Disk bushing	Stainless steel
14	Disk insert	Stellite grade3
15	Disk insert cotter pin	Stainless steel
16	Spindle (1)	Monel Alloy
17	Spindle lock clip	Stainless steel
18	Protective bonnet	ST37
19	Cap cotter pins	Stainless steel
20	Guide ring stop pin	Stainless steel
21	Bonnet	Cast steel A217-WC6
22	spring	Alloy steel
23	Spring washer	Alloy steel
24	Adjusting screw	Stainless steel
25	Adjusting screw lock nut	Alloy steel
26	Cap	Cast steel A216-WCB
27	Seal	Lead
28	Cooling spool studs(UNC1")	Alloy steel
29	Body studs(UNC1")	Alloy steel
30	Stud nuts(UNC1")	Alloy steel
31	Cooling spool aligner	Gunmetal
32	Cooling spool	Cast steel(A217-WC6)
33	Guide aligner	Gunmetal
34	Forked lever pin	Stainless steel
35	Hand lever	ST52
36	Han lever pin	Stainless steel
37	Spindle nut	Alloy steel
38	Spindle nut cotter pin	Stainless steel
39	Cap set screw M10	Stainless steel
40	Forked lever	S.G. iron
41	Spindle (2)	Stainless steel
42	Pin	Stainless steel

Number 18 is not shown in the picture



### Capacities for saturated steam

Set pressure (psi g)	1004
Saturated steam capacity ( lit/h)	62324

### How to order

connections Size

Set pressure : (bar g)

Working pressure and temperature:(bar g , C)

## HE Safety Valve - 201 bar

### Description

HE safety valve is High capacity, back pressure assisted close, safety valve.

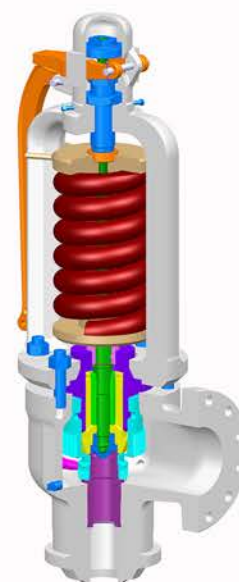
High pressure drum service. Two-ring control. Seat tightness at 96% set pressure.

HE safety valve is designed according to ASME, Sec.1

### Applications

HE safety valve is suitable for:

saturated steam service on boiler drums having design pressure above 2000 psig [138 bar g] up to critical pressure.



### Sizes and pipe connections

Valve size inlet x orifice x outlet	HE Valve style	Orifice area [sq. mm]	Set Pressure [PSIG]	Connections [mm]		Dimensions - [mm]				Approx. Height [mm]
				Butt Weld Inlet	ANSI Class Flanged Outlet	Inlet I.D.	Inlet O.D.	Center to face of		
								Inlet	Outlet [Class 300]	
A	B	C	D	E						
3 M2 6	HE-96W	2565.2	2913	76.2	6"-300	76.2	203	305	254	1267

Flange standard ANSI B16.5

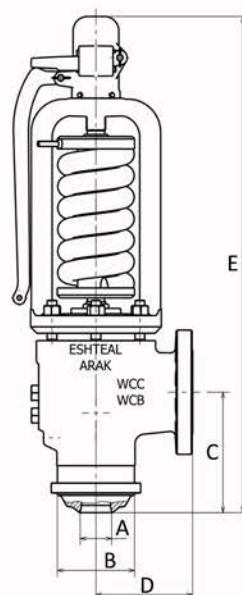
Welded inlet: 3" (class 2500)

Outlet flange rating: 6" (Class 300)

### Limiting Conditions

Temperature up to 593°C

See the chart.

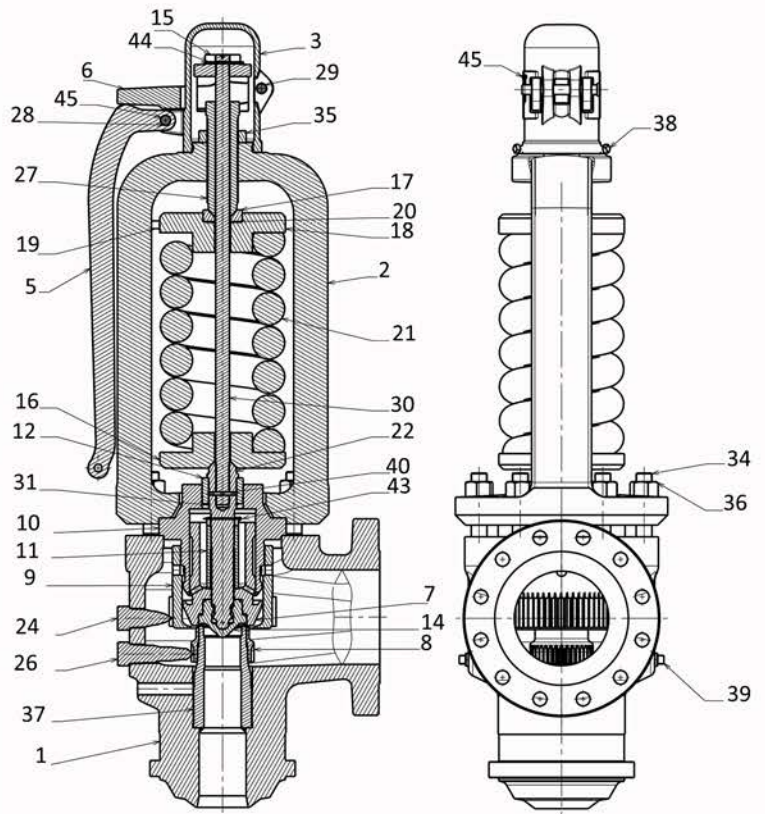


## HE Safety Valve - 201 bar

### Material

Item	Part Number	Material
1	Body	Carbon steel SA-216 Gr.WCC
2	Bonnet	Carbon steel SA-216 Gr.WCC
3	Cap	Steel
4	Test lever	Steel
5	Hand lever	Steel
6	Forked lever	Steel
7	Disc holder	Nickel alloy
8	Nozzle ring	Stainless steel
9	Guide ring	Stainless steel
10	Guide	Nickel alloy
11	Disc holder retaining nut	Stainless steel
12	Piston	Nickel alloy
13	Test plug	Stainless steel
14	Disc insert	Inconel
15	Spindel nut	Steel
16	Bottom spring washer	Steel
17	Bearing adapter	Alloy steel
18	Top spring washer	Steel
19	Top spring washer pin	Steel
20	Thrust bearing	Steel
21	Spring	Alloy steel
22	Spindel(1)	Stainless steel
23	Test cap	Stainless steel
24	Guide Ring Set Screw	Stainless steel
25	Test lever screw	Stainless steel
26	Nozzle Ring Set Screw	Stainless steel
27	Adjusting screw	Stainless steel
28	Hand lever pin	Steel
29	Forked lever pin	Steel
30	Spindel(2)	Stainless steel
31	Piston retaining ring	Stainless steel
32	Bottom spring washer pin	Steel
33	Plug pin	Stainless steel
34	Bonnet stud	Alloy steel SA-193 Gr.B7
35	Adjusting bolt nut	Steel
36	Bonnet stud nut	Steel SA-194 Gr.2H
37	Nozzle	Stainless steel
38	Cap bolt	Steel
39	Drain plug	Stainless steel
40	Spindel pin	Stainless steel
41	back-up ring	Viton
42	o-ring	Viton
43	Split pin	Stainless steel
44	Split pin	Stainless steel
45	Split pin	Stainless steel

Numbers. 4,13,23,25,32,41 and 42 are not shown in the picture



### Capacities for saturated steam

Set pressure (psi g)	2913
Saturated steam capacity ( lit/h)	623211

### How to order

connections Size

Set pressure : (bar g)

Working pressure and temperature:(bar g , C)

# H Series Safety Valve

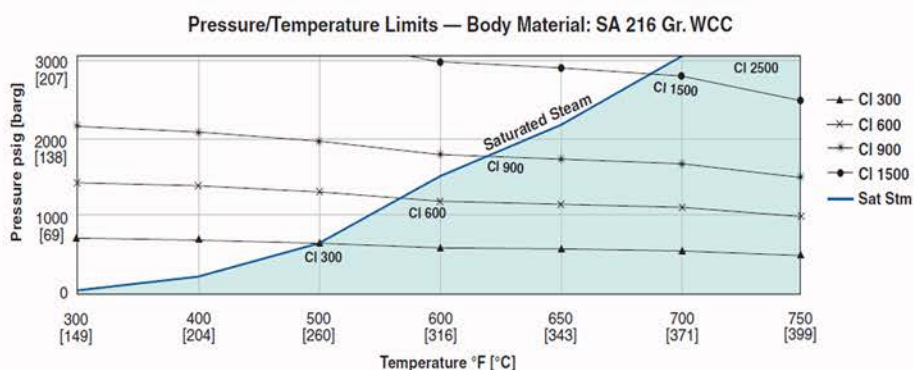
## Capacity Calculation

Superheat Correction Factor  $K_{sh}$

Flowing Pressure P <sub>sia</sub> [bara]	Total Temperature Superheated Steam													
	500°F [260°C]	550°F [288°C]	600°F [316°C]	650°F [343°C]	700°F [371°C]	750°F [399°C]	800°F [427°C]	850°F [454°C]	900°F [482°C]	950°F [510°C]	1000°F [538°C]	1050°F [566°C]	1100°F [593°C]	
400 [27.6]	.963	.935	.906	.880	.857	.836	.816	.798	.782	.766	.751	.737	.724	
500 [34.5]	.961	.946	.914	.886	.862	.840	.820	.801	.784	.768	.753	.739	.725	
550 [37.9]	.962	.952	.918	.889	.864	.842	.822	.803	.785	.769	.754	.740	.726	
600 [41.4]	.964	.958	.922	.892	.867	.844	.823	.804	.787	.770	.755	.740	.727	
950 [65.5]	-	.969	.958	.918	.886	.860	.836	.815	.796	.778	.761	.746	.732	
1000 [69.0]	-	.974	.959	.923	.890	.862	.838	.816	.797	.779	.762	.747	.732	
1050 [72.4]	-	-	.960	.927	.893	.864	.840	.818	.798	.780	.763	.748	.733	
2600 [179.3]	-	-	-	-	.951	.903	.849	.812	.782	.756	.735	.715	.698	
2650 [182.7]	-	-	-	-	.952	.903	.848	.809	.779	.754	.731	.712	.695	
2700 [186.2]	-	-	-	-	.952	.903	.846	.807	.776	.750	.728	.708	.691	
2900 [200.0]	-	-	-	-	.963	.902	.836	.794	.762	.735	.713	.693	.675	
2950 [203.4]	-	-	-	-	-	.902	.834	.790	.758	.731	.708	.688	.671	
3000 [206.9]	-	-	-	-	-	.899	.831	.786	.753	.726	.704	.684	.666	

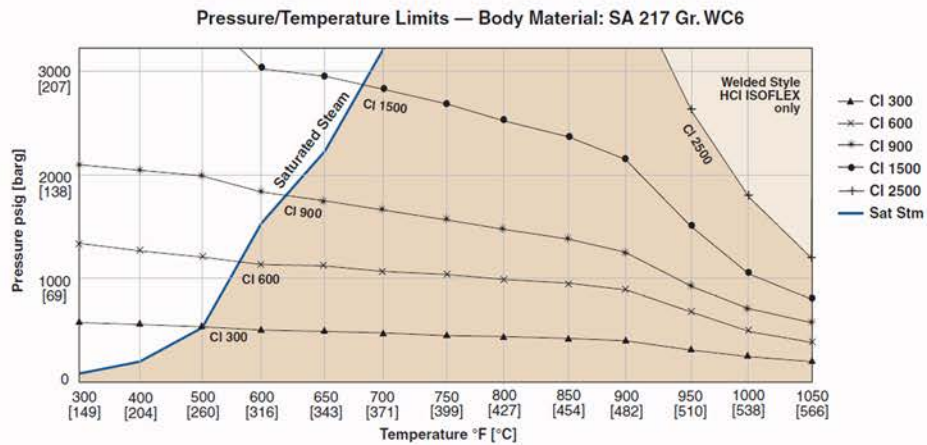
## Limiting Condition Chart

HCI - 181.5 bar, HCI - 38 bar, HE - 201 bar



## H Series Safety Valves

HC - 69.1 bar, HCA - 69.1 bar



Saturated Steam Capacities Kilograms per hour (kg/hr) at 3% overpressure Set Pressures 1 to 213 [barg]			
Orifice Designation and Area (sq. mm.)			
Orifice [mm <sup>2</sup> ] Set Pressure [barg]	M2 2565.2	P2 4561.3	M 2322.6
1.034	-	-	2341
20	25562	45454	23145
28	35308	62783	31969
35	43835	77946	39689
38	47489	84444	42998
41	51144	90942	46307
55	68198	121268	61749
63	77944	138597	70573
66	81598	145095	-
69	85253	151594	-
70	86471	153760	-
80	98653	175421	-
90	110834	197082	-
100	123016	218743	-
110	135792	241462	-
120	149376	265615	-
130	163345	290456	-
137	173390	308316	156993
150	192734	342714	174508
160	208348	370478	188645
178	238565	424208	216004
181	243929	433746	220861
184	249404	443483	225819
197	274642	488359	248670
200	280875	499443	254313
201	282992	503208	256230
204	289470	514727	262096
213	310195	551578	280860

## Water Level Control System For Steam Boilers

### Description

Water level controls have magnetically operation. they are designed to meet all the requirements for automatic on/off control of boiler feed pump, burner cut-out, high and/or low alarm or any combination of these.

### Conversion Heads

this VABC heads are designed to fit into existing float chambers, and provide an economical method of updating boiler water level controls to the latest models.

### Operation

this type is a element electro-hydraulic control with an electronic feedback. the system comprises a control unit float chamber, a feed line modulating valve and a control box.

### Sizing Of Valve Lids

A range of valve lids and associated seats are available and provide linear flow characteristics. a table of cv values for water (S.G. =1) is

given below for valve lids in fully open position.  $CV = \frac{Q}{\sqrt{P}}$

Q : actual evaporation of boiler plus 15 per cent margin kg/hr.

P: pump discharge pressure kg/cm<sup>2</sup> when passing Q quantity of water minus (boiler max. working pressure plus 0.4 kg/cm<sup>2</sup>).

Type of lid	Cv=kg/hr for 1 kg/cm <sub>2</sub>
A	1.690
B	2.260
C	3.030
D	4.100
E	5.480
F	7.480
G	9.840
H	13.520
I	18.480

### Mounting

BXO types are chamber mounted and BDO types are direct mounted.



## Water Level Control System For Steam Boilers

### Chamber mounted



BXO 150 psi

BXO 300 psi

### Sizing of chamber mounted model

Type number	Operating range	No of Switches max	Flanged screwed connection	Dimensions (mm)							
				C	G	H	H1	L	W	F	
<b>CAST IRON CHAMBER –WORKING PRESSURE: 13KG/CM<sup>2</sup></b>											
BX02/1	62	1	-	BS4504.25-16/11	-	102	193	303	366	182	160
BX05/2	150	2	4	BS4504.25-16/11	-	102	293	497	468	277	160
BX07/2	250	2	5	BS4504.25-16/11	-	102	394	602	557	370	160
<b>FABRICATED STEEL CHAMBER –WORKING PRESSURE :21KG/CM<sup>2</sup></b>											
BX 09/1	62	1	-	BS4504.25-40/2	-	87	193	303	366	182	160
BX 10/2	150	2	4	BS4504.25-40/2	-	87	293	497	468	277	160
BX 11/2	250	2	6	BS4504.25-40/2	-	87	393	602	557	370	160
<b>FABRICATED STEEL CHAMBER –WORKING PRESSURE:32KG/CM<sup>2</sup></b>											
BX 12/1	62	1	-	BS 450.25-40/2	-	102	193	303	559	372	160
BX 13/2	150	2	4	BS 450.25-40/2	-	100	293	497	559	372	160
BX 14/2	250	2	6	BS 450.25-40/2	-	100	393	602	559	370	160

# Water Level Control System For Steam Boilers

## Electrical Characteristics

Single pole and double -throw operation for:

AC:

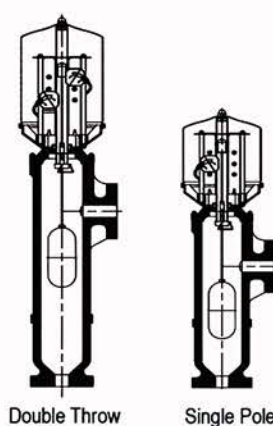
Maximum voltage 250 V  
Maximum current 5A  
Maximum power factor 0.4  
Maximum power 2000 VA

DC:

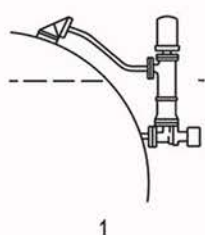
Resistive  
Maximum power 100W  
Maximum voltage 250V  
Maximum current 5A

Inductive

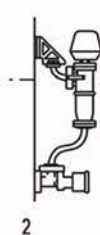
Maximum voltage 250 V  
Maximum current 0.5A  
Maximum time constant 40ms  
Maximum power 100W



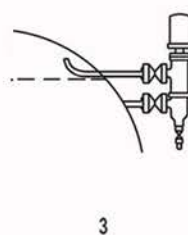
Arrangements of vertical controllers on various types of boiler



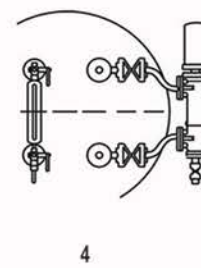
side and bottom  
entry chamber with  
sequencing valve on  
horizontal boiler



side and bottom  
entry chamber  
with sequencing  
valve on vertical  
boiler



side and side entry  
chamber on horizontal  
boiler



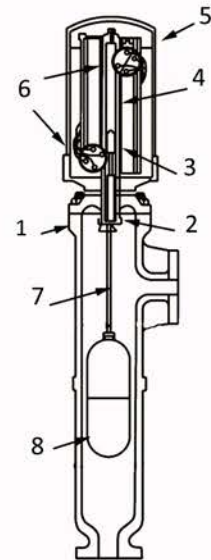
side and side entry  
chamber on steam  
drum of water tube  
boiler



## Water Level Control System For Steam Boilers

### Material of chamber mounted model

Num.	Part name	Material	
		Cast iron GG25	Cast steel A216-WCB
1	Chamber	Cast iron GG25	Cast steel A216-WCB
2	Stop cap	Stainless Steel	
3	Magnet	-	
4	Center tube	Stainless Steel	
5	Switch head	Aluminum	
6	Switch units	Cast ceramic	
7	Float road	Stainless Steel	
8	float	Stainless Steel	



### How to order water level control

Working pressure and temperature (bar g , C)

Connection type

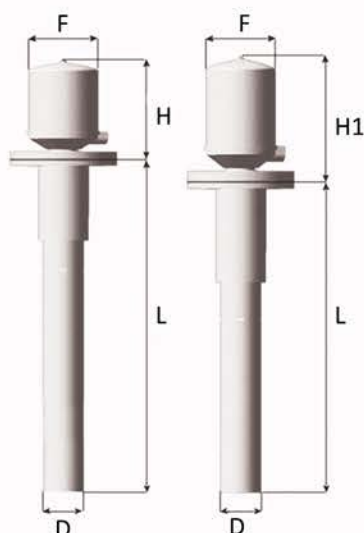
Mounting type

# Water Level Control System For Steam Boilers

## Direct mounted

Direct mounted vertical controllers employ the same principles of operation and piece parts as the chamber mounted equivalents except that the chamber is exchanged for a large round flange and the tube assembly for mounting the controller directly on to the boiler shell connection. a stilling or guide tube should be provided, which may be fixed or removable, to ensure that the float rod is not damaged and the correct vertical movement is achieved.

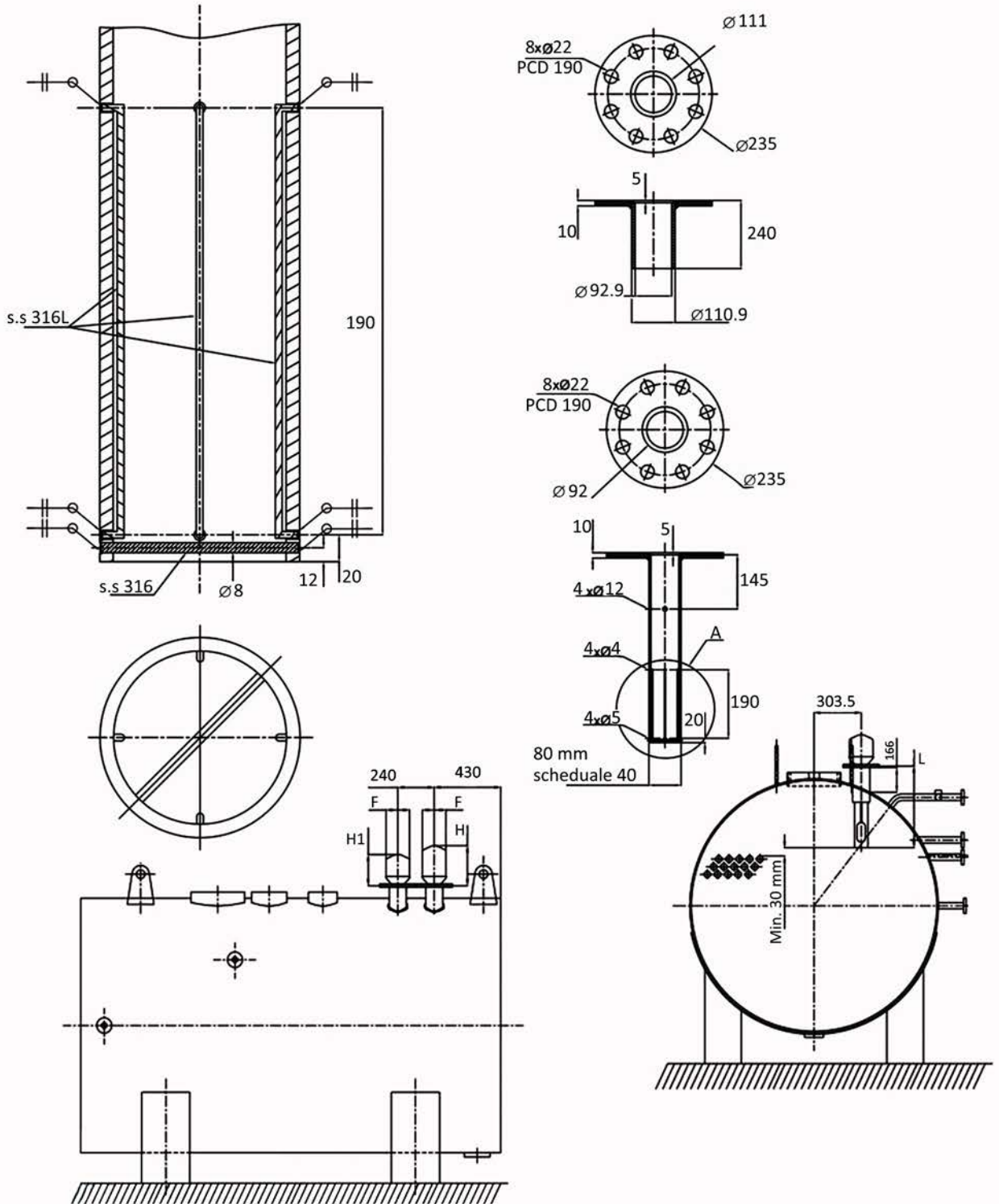
## Sizing Of Direct Mounted Model



BDO 150psi

Model		L	F	H	H1	D
Class	Switches					
LC.D.A3.40	1			193	303	80
	2			293	307	80

## Water Level Control System For Steam Boilers



## Water Level Control System For Steam Boilers

### Sequencing blowdown valves

Sequencing blowdown valve is designed to function as a manually operated combined water isolating valve and sequencing valve. it provide positive purging of the water connection, float chamber and steam connection of a boiler control. steam or hot water boilers, vessels and general relief applications.



### Size of sequencing valve

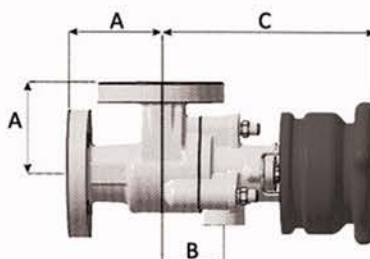
P: pitch circle dia.

O: dia. of holes

N: num. of holes

F: outside flange dia.

T: flange thickness



Dimensions										
Model	Size		F	T	N	O	P	A	B	C
Class	DN	in								
BD.S.GI-PN16	25	1"	115	18	4	14	85	83	54	219
BD.S.A3-PN40	25	1"	115	18	4	14	85	83	54	219

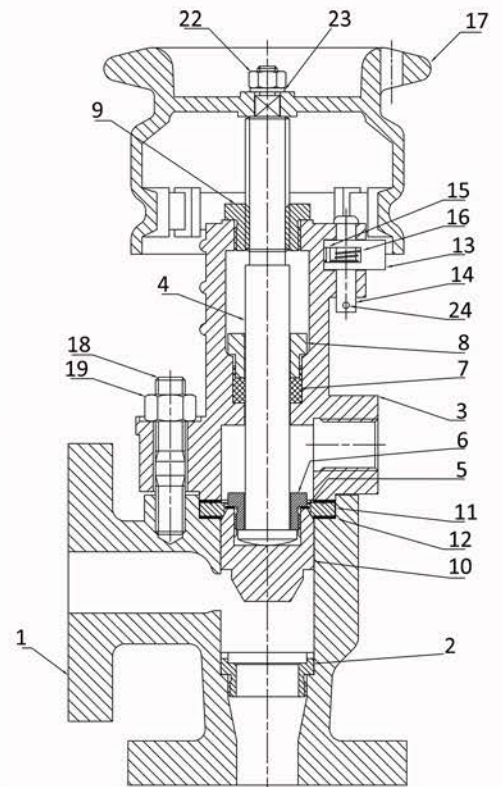
### Limiting condition of sequencing valve

Specifications		
Feature	BD.S.GI	BD.S.A3
Body material	Cast iron BS1452-G220	Bronze-Gunmetal
Max. working pressure (bar)	13	21
Flange	BS.4504-PN16	BS.4504-PN40

## Water Level Control System For Steam Boilers

### Material of sequencing valve

NUM.	Part Name	Material	
1	Water Leg	Cast iron(GG25)	Gunmetal
2	Water Leg valve seat	Stainless steel	
3	Stuffing box	Cast iron (GG25)	
4	spindle	Stainless steel	
5	Tab washer	Copper	
6	Retaining nut	Stainless steel	
7	Gland packing	Teflon packing	
8	Gland follower	Stainless steel	
9	ACME THRD nut	Brass	
10	Valve Lid	Nickel alloy	
11	Blow down seat	Nickel alloy	
12	Gasket	Compress fiber with binder	
13	Pawl	Brass	
14	Pawl pin	Stainless steel	
15	Pawl spring pin	Stainless steel	
16	Pawl spring	Stainless steel	
17	Hand wheel	Aluminum	
18	Stud	steel	
19	Hexagon nut	steel	
20	Stud	steel	
21	Hexagon nut	steel	
22	Hexagon nut	steel	
23	Plain washer	steel	
24	Split pin	steel	



### How to order sequencing valve

Working pressure and temperature (bar g , C)

Connection type

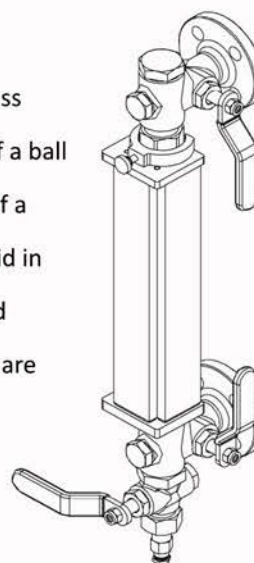
Mounting type

## Absolute Liquid Level Gage

### Description

The Absolute liquid level gage is suitable for use with a variety of liquids on pressure vessels, tanks etc.. in many industries.

the gauge is automatic in top and bottom arms. in the event of the gauge glass breaking both the vapor and the liquid are automatically shut of by means of a ball in each arm. there is no possibility of trapping false liquid levels, as the use of a large ball valve in the water arm ensures its opening against the head of liquid in the vessel. top arm and bottom arm are easily replaceable on site. steam and water passages are straight and easy access. the basic top and bottom arms are interchangeable. the top and bottom arm connections use identical rubber cones for sealing.



### Applications

Absolute liquid level gage is suitable for:  
pressure vessels, tanks etc.. in many industries.

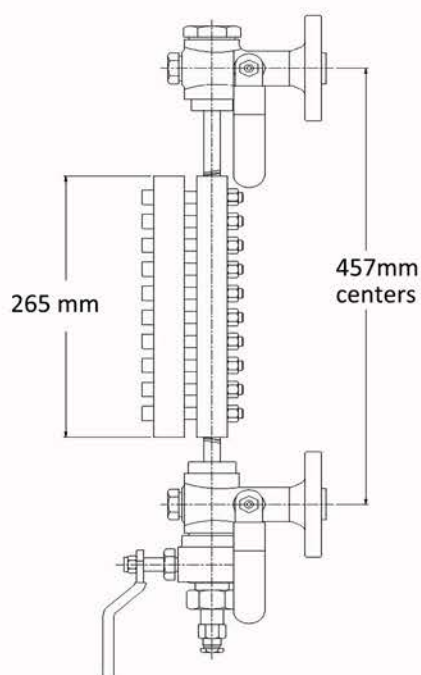
### Sizes and pipe connections

Size: 1/2 in, and 3/4 in

Absolute liquid level gage

300 psi

Dimensions are approximate and in mm.



## Absolute Liquid Level Gage

Dimensions are approximate and in mm.

tabular gauge glass

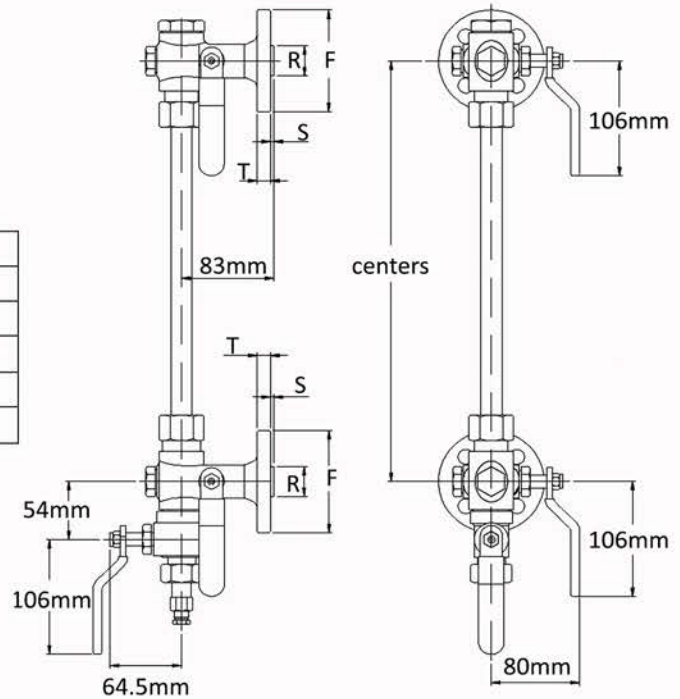
13mm diameter ( $\frac{1}{2}$ "

type	Flange dimensions, in mm						
	F	T	R	S	N	O	P
21211	95	12	28	3	4	14	65
21212	95	14	28	3	4	14	65
21213	115	12	28	3	4	18	82.5
21214	115	14	28	3	4	18	82.5

tabular gauge glass

19 mm diameter ( $\frac{3}{4}$ "

type	Flange dimensions, in mm						
	F	T	R	S	N	O	P
21215	115	12	28	3	4	18	82.5
21216	115	14	28	3	4	18	82.5



Right hand gauge shown

Absolute liquid level gage

150 psi

type	Glass length	Centers
$\frac{1}{2}$ " - 13mm	343mm	392mm
$\frac{3}{4}$ " - 19mm	406mm	457mm

N: number of holes

O: dia. of holes

P: pitch circle dia.

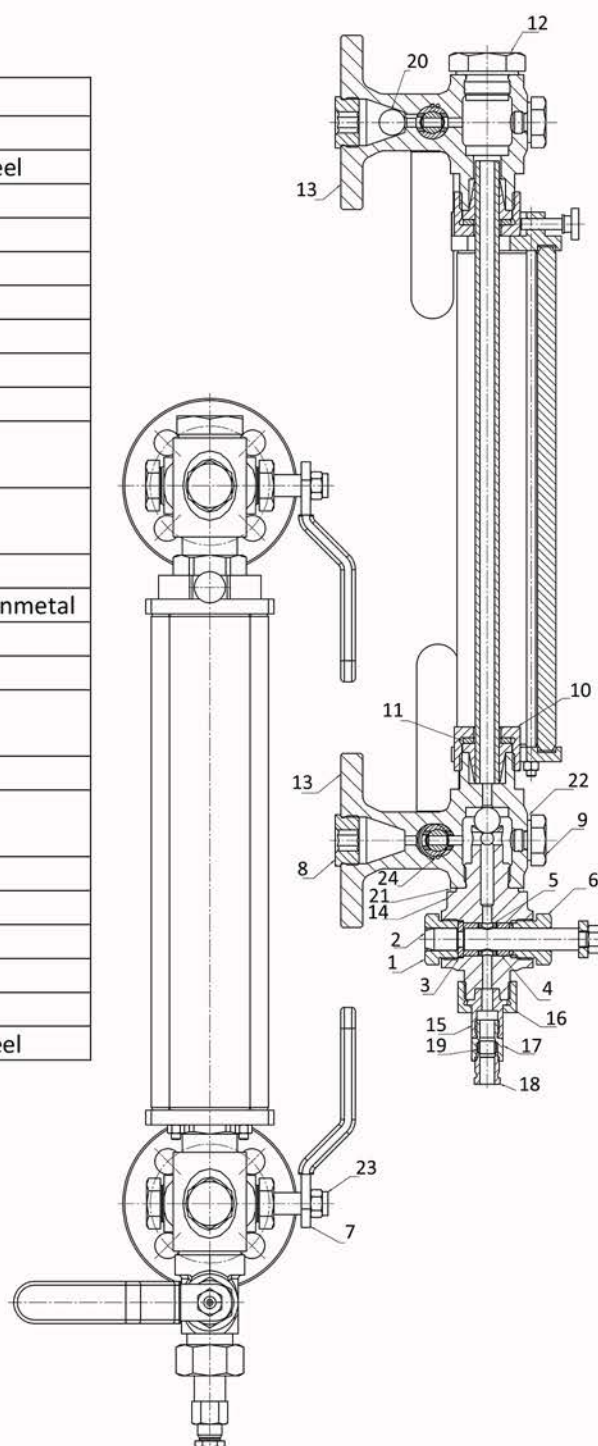
### Limiting Conditions

max. working conditions pressure range	Steaming	18.5 bar
	Non-steaming	24 bar

## Absolute Liquid Level Gage

### Material

Num.	Part name	Material
1	Stem nut	Brass
2	stem	Stainless Steel
3	Stem washer	Brass
4	Packing	PTFE
5	Packing bush	Brass
6	Packing nut	Brass
7	Handle	ST37
8	Bottom plug	Brass
9	Top plug	Brass
10	Gage glass packing nut	Brass
11	Gage glass packing washer	Brass
12	End plug	Brass
13	Bottom arm body	Bronze   Gunmetal
14	Try valve body	Bronze
15	Try valve fitting	Brass
16	Try valve fitting nut	Brass
17	Drain pipe nut	Brass
18	Drain pipe fitting nut	Brass
19	Olvis	Brass
20	Ball	Steel
21	Washer	Copper
22	Washer	Copper
23	Nut	Steel
24	pin	Stainless steel



### How To Order

Connections size

Type of liquid

Working pressure and temperature : (bar , C)

Height of level gage





# Magnetic Liquid Level Gage

## Description

Magnetic liquid level gages have been designed for optical viewing of liquid levels in most industrial applications.

chamber, floater, glass indicator, wafer flaps and flanges are different parts of magnetic level gage.

## Applications

Magnetic liquid level gage is suitable for:  
high pressure and high temperature applications.

## Sizes and pipe connections

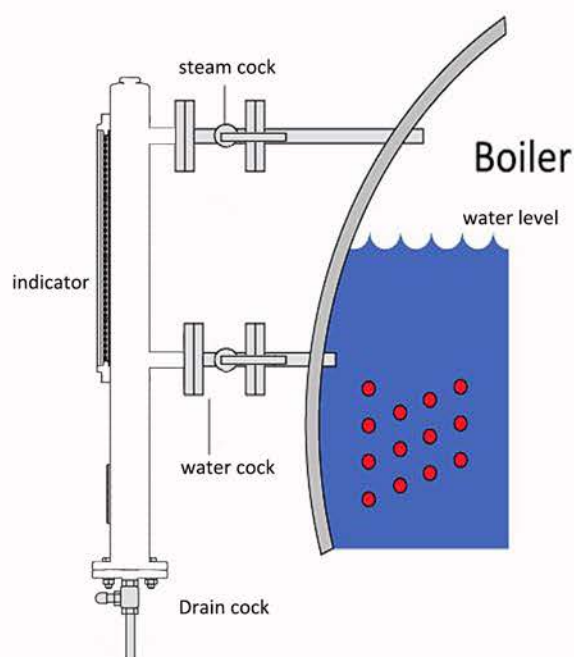
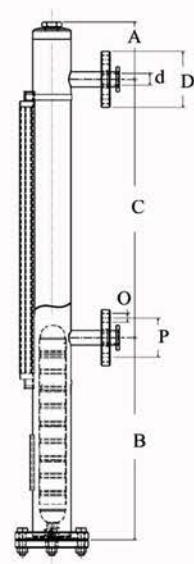
size	
A	99 mm
B	356.5 mm
C	380 mm
C	457 mm

flange B.S.10 Table H (d = 20.5 mm)	
N( number of holes)	4 mm
O( diameter of holes)	19 mm
P	82.6 mm
D (outside diameter)	115 mm

flange B.S.10 Table H (d = 26.6 mm)	
N( number of holes)	4 mm
O( diameter of holes)	19 mm
P	82.6 mm
D (outside diameter)	115 mm

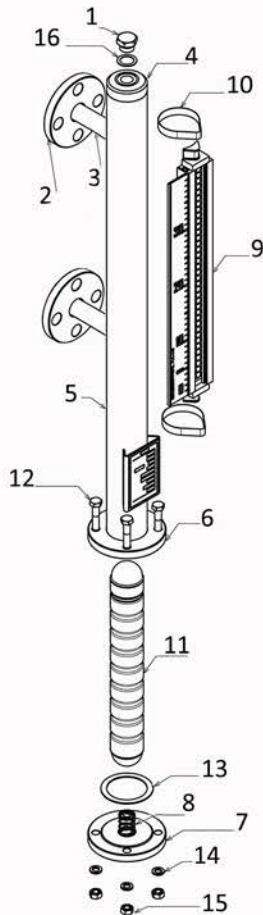
## Limiting Conditions

Design pressure range	-1 bar	20 bar
Design Temperature range	-196 C	400 C



## Magnetic Liquid Level Gage

### Material



NUM.	Part name	Material
1	Screw	Stainless steel
2	Connection Flange	Stainless steel
3	Connection Pipe	Stainless steel
4	Body cap	Stainless steel
5	Body	Stainless steel
6	Bottom flange	Stainless steel
7	Spring support	Stainless steel
8	Spring	Stainless steel
9	gage	-
10	Joint	Stainless steel
11	Floater	Stainless steel
12	Flange screw	Stainless steel
13	Gasket	Compressed fiber
14	washer	Stainless steel
15	Nut	Stainless steel

### Installation

inlet and outlet connections are in side of vessel.

### How to order

Working pressure and temperature (bar, C)

special gravity of fluid

Range of indicators height

With considering connections.



## Feed Check Valves

### Description

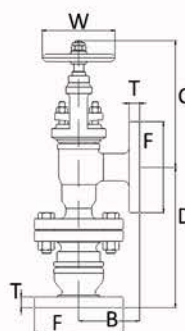
These valves are a development of screw-down stop valves and the design makes use of a conventional angle pattern stop valve to which is connected a separate inlet branch which houses the check valve. this check inlet branch is of unique design in that the check valve head and its guide are arranged below the face of the connecting flange enabling the branch to be withdrawn without disturbing the feed piping. with the stop valve closed this feature permits speedy examination and maintenance of the check valve seating when the boiler is under steam.



### Sizes and pipe connections

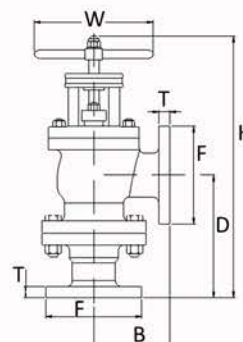
#### Bronze feed check valve

size	connection		F	T	B	D	C (open)	W
	inlet	outlet						
1"	BS.10 Table F	BS.10 Table F	121	14	80.5	186	179	92



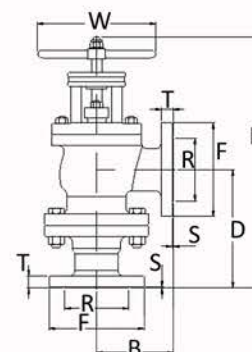
#### Cast iron feed check valve

size	connection		F	T	B	D	W	H (open)
	inlet	outlet						
1 1/2"	BS.10 Table F	BS.10 Table F	140	17	124	188	175	413
2"	BS.10 Table F	BS.10 Table F	165	19	130	205	175	435
3"	BS.10 Table F	BS.10 Table F	203	22	153	267	224	558



#### Cast steel feed check valve

size	connection		F	T	B	D	W	H (open)
	inlet	outlet						
1 1/2"	BS.10 Table H	BS.10 Table H	140	17	124	188	175	413
2"	BS.10 Table H	BS.10 Table H	165	19	130	205	175	435
3"	BS.10 Table H	BS.10 Table H	203	22	153	267	224	558



Dimensions are approximate and in mm.

## Feed Check Valves

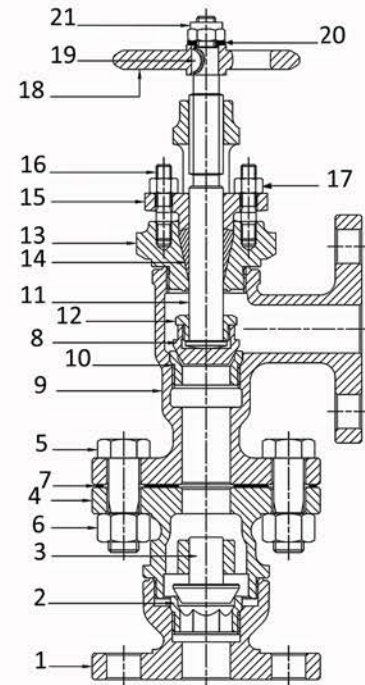
### Limiting Conditions

Body material	Feed line pressure (bar)	Temperature (°C)
Bronze	11	Steam at saturation temp.
Cast iron	13.1	195
Cast steel	25	210

### Material

Bronz body feed check valve

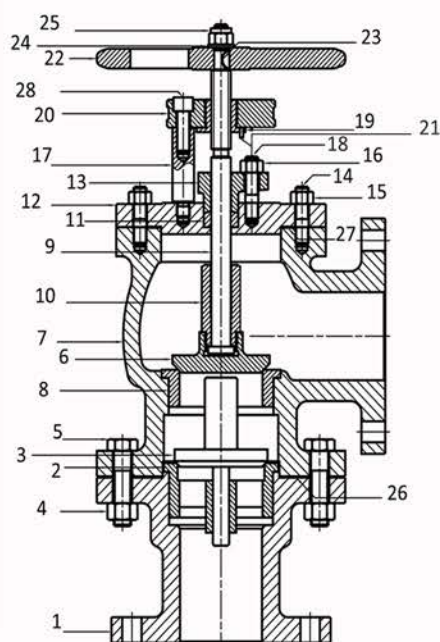
Num.	Part Name	Material
1	Check valve body	Bronze
2	Check valve seat ring	Stainless steel
3	Check valve disk	Stainless steel
4	Check valve bonnet	Bronze
5	Hex. Head screw	Steel
6	Hex. nut	Steel
7	Gasket	Compress fiber with binder
8	Feed valve disk	Stainless steel
9	Feed valve body	Bronze
10	Feed valve seat ring	Stainless steel
11	Stem	Brass
12	disk nut	Brass
13	Feed valve bonnet	Bronze
14	Gland packing	Teflon packing
15	Gland flange	Bronze
16	Stud	Steel
17	Hex. nut	Steel
18	Hand wheel	Cast iron (GG25)
19	woodruff key	Steel
20	washer	Steel
21	Hex. nut	Steel



## Feed Check Valves

Cast iron and cast steel Body feed check valve

Num.	Part name	Cast iron check valve Material	Cast steel check valve Material
1	Check valve Body	Cast iron (GG25)	Cast steel (A216-WCB)
2	Check valve Seat Ring	Nickel alloy	Nickel alloy
3	Check valve Disk	Stainless steel	Stainless steel
4	Hex. Nut	Steel	Steel
5	Hex. Head screw	Steel	Steel
6	Feed valve disk	Stainless steel	Stainless steel
7	Feed valve body	Cast iron (GG25)	Cast steel (A216-WCB)
8	Feed valve seat ring	Stainless steel	Stainless steel
9	Stem	Stainless steel	Stainless steel
10	Disk Nut	Brass	Brass
11	Packing	Teflon packing	Teflon packing
12	Feed valve bonnet	ST 52	ST 52
13	Gland flange	Bronze	Bronze
14	Stud	Steel	Steel
15	Hex. Nut	Steel	Steel
16	Hex. Nut	Steel	Steel
17	Yoke Pedestal	ST37	ST37
18	Stud	Steel	Steel
19	Yoke Bushing	Brass	Brass
20	Yoke	ST 52	ST 52
21	Pin	Alloy steel	Alloy steel
22	Hand wheel	Cast iron (GG25)	Cast iron (GG25)
23	Woodruff Key	Steel	Steel
24	Washer	Steel	Steel
25	Nut	Steel	Steel
26	Gasket	Compress fiber with binder	Compress fiber with binder
27	Gasket	Compress fiber with binder	Compress fiber with binder
28	Hex. Socket head cap screw	Steel	Steel
29	Serial no. plaque	Stainless steel	Stainless steel



## Feed check valve

### Installation

- these valves are installed after the pump and before the boiler.
- feed check valves must be installed with the spindle vertical without vibrations.
- it is recommended to use the appropriate filter before the feed check valve.
- note that when you install gaskets sealing flange to cover the entire surface.
- washers that are used to feed check valve must be wired to be crushed under the pressure and with a lack of sealing will not damage the pump.
- when clamping flanges, make sure they do not tolerate.

### How to order

connection size

working pressure and temperature: (bar,C)



## Air & Tester valves

### Description

This valve has a simple design and rugged construction for reliable performance over long periods is working. it can be supplied as a tester valve with elbow removed and outlet tapped 3/8 Rp and plugged. it can also be supplied with outlet fitted with adaptor and tail pipe tapped 1/4 Rp.

### Applications

In the boilers this valve used as the main valve on the way of pressure switch.

### Sizes and pipe connections

Dimensions are approximate and in mm.

Connections: Screwed 1 / 2 RP

W	P	H (open)	S
∅ 90	69	135	52

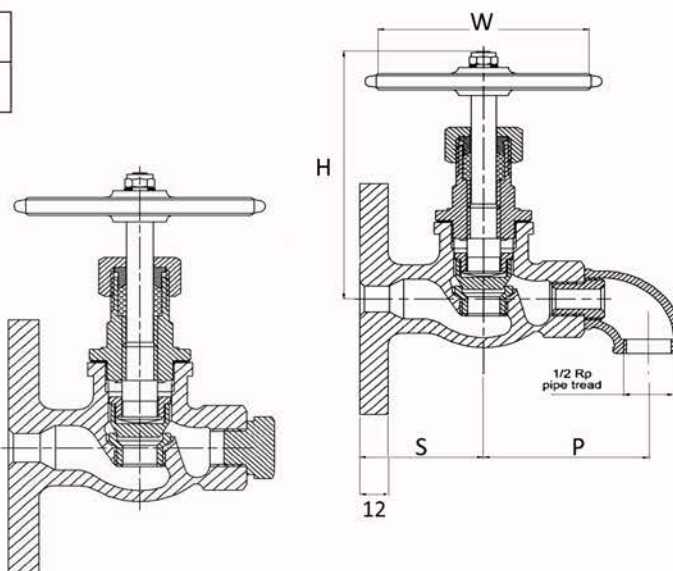
FLANGE DIMENSIONS			
F	N	O	P
95	4	14	66
115	4	18	82

F : flange outside dia.

N: number of holes

o: dia. of holes

p: pitch of circle dia.



### Limiting Conditions

Temperature (°C)	-18 to 121	149	177	204	Saturated steam temp.
Pressure (bar)	34.5	34.5	34.5	28	Up to 24



## Air & Tester valves

### Material

Num	Part name	Material
1	Body	Bronze
2	Connector(for Air valve)	ST37
3	Elbow(for Air valve)	Cast iron
4	Seat Ring	Stainless steel
5	Disk	Stainless steel
6	Disk nut	Brass
7	Stem	Brass
8	Washer	Copper
9	Stem Bushing	Brass
10	Packing	PTFE
11	Packing flange	Brass
12	Stem bushing nut	Brass
13	Hand wheel	Cast iron(GG25)
14	Woodruff key	Steel
15	Washer	Steel
16	Nut	Steel
17	plug(for Air valve)	Brass

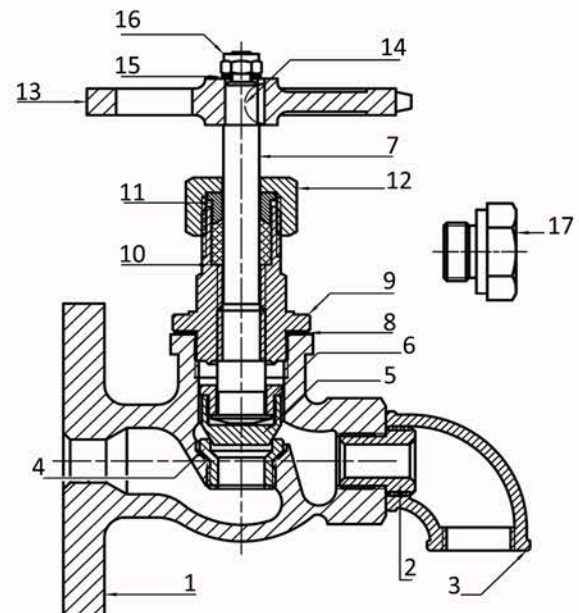
### Installation

- install on the way of boiler pressure switch.
- the valve is always open.

### How to order

Connections

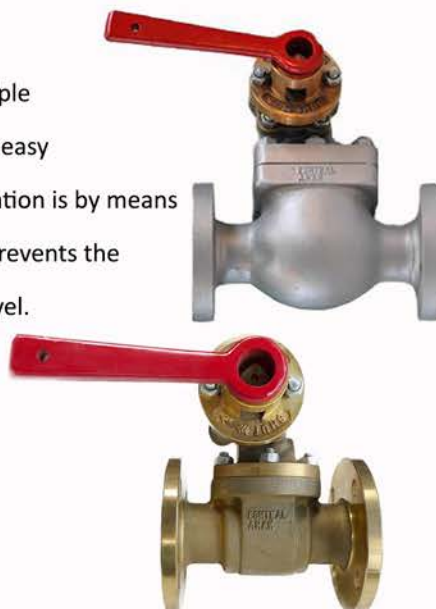
working pressure & temperature (barg),(C)



## Parallel Slide Blowdown Valve

### Description

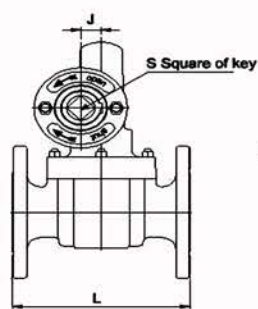
These valves are constructed on the parallel slide stop valve principle which provide an uninterrupted flow through the valve and ensures easy operation and fluid tightness under all conditions of service. operation is by means of rack and pinion removable box-key. a stop on the pinion shaft prevents the possibility of straining the rack and pinion teeth at the ends of travel. the gland is fitted with a special locking guard which prevents the removal of the box-key unless the valve is closed. acc. to BS.759



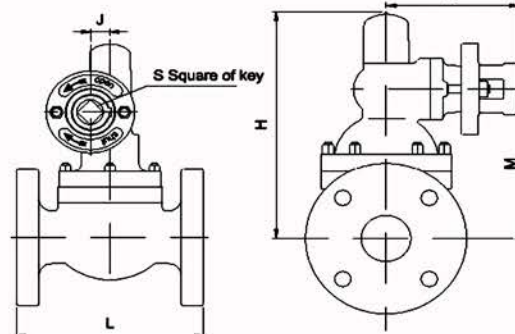
### Sizes and pipe connections

Dimensions are approximate and in mm.

Body material	Size	Flange Standard	F	N	O	P	L	H	M	S	J	K
Bronze 150 psi	2"	BS 10 Table F	165	4	17	127	188	212.5	129.5	20	19	145
		BS 1560 Class150	165	4	17	127	210	212.5	129.5	20	20	145
		BS 4505 PN16	165	4	19	125	188	212.5	129.5	20	19	145
Gunmetal 300 psi	2"	BS 10 Table H	165	4	17	127	198	212.5	129.5	20	19	145
		BS 1560 Class 300	165	8	19	127	198	212.5	129.5	20	19	145
		BS 4505 PN40	165	4	19	125	198	212.5	129.5	20	19	145
Steel 300 psi	1 ½"	BS 10 Table H	140	4	17	105	267	254	171	20	19	145
		BS 1560 Class300	156	4	22	114						
		BS 4505 PN40	150	4	19	110						
	1 ¼"	BS 10 Table H	133	4	17	98	261	254	171	20	20	145
		BS 1560 Class300	133	4	19	98						
		BS 4505 PN40	140	4	19	100						



Body material Bronze & Gunmetal



Body material : Cast Steel

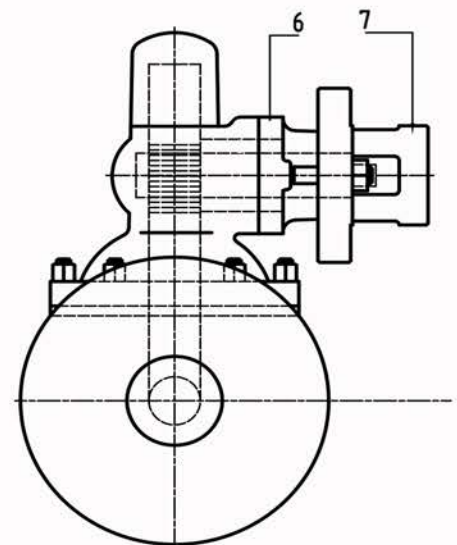
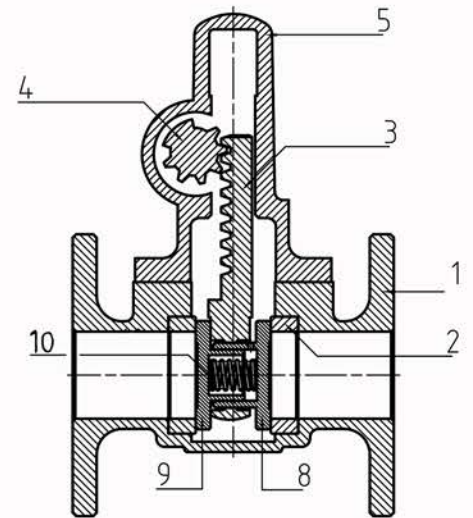
## Parallel Slide Blowdown Valve

### Limiting Conditions

Flange standard	Pressure / temperature rating							
	BS 4505 PN16	Temperature (°C)	-18 to 121	149	177	204	232	260
Pressure (bar)		20.7	20.7	20.7	16.9	13.4	10.3	-
BS 4505 PN40	Temperature (°C)	-18 to 121	150	180	200	220	250	260
	Pressure (bar)	25	25	25	21.2	17.5	12.2	10.5
Table F	Temperature (°C)	-18 to 120	150	149	177	204	232	260
	Pressure (bar)	16	16	16	13.51	11.3	8	7
Table H	Temperature (°C)	-18 to 120	150	149	177	204	232	260
	Pressure (bar)	25	25	25	21.2	17.5	12.2	10.5

### Material

Num.	Part name	Material		
		1	Body	Bronze casting
2	Seat	Nickel alloy		
3	Rack	Gunmetal		
4	Pinion	Gunmetal		
5	Bonnet	Bronze	Cast steel (A216-WCB)	Gunmetal
6	Packing bushing	Bronze		
7	Gland bushing	Bronze		
8	Female disk	Nickel alloy		
9	Male disk	Nickel alloy		
10	spring	Stainless steel		



### How to order

Connection size

Fluid and working conditions

## Parallel Slide Blowdown Valve Link type for small boilers

### Description

These valves is an adaptation parallel slide valve which is designed to ensures ease of operation and tight closure.

the valve being suitable for flow in either direction.

the valve opens with less than a quarter turn of the box-key.

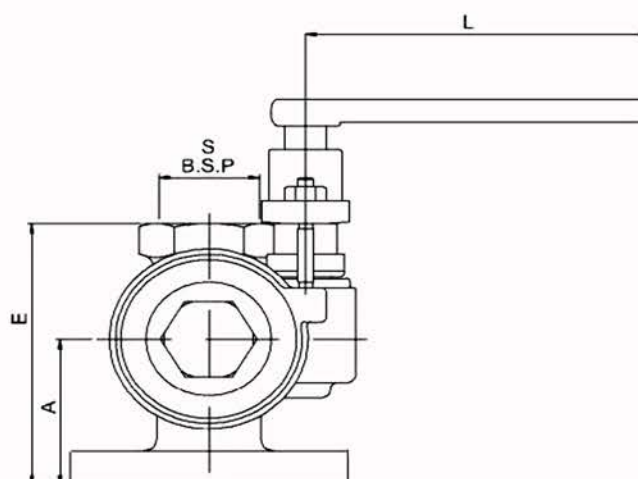
a lever type box-key is supplied with each valve.

acc. to BS.759



### Sizes and pipe connections

Dimensions are approximate and in mm.



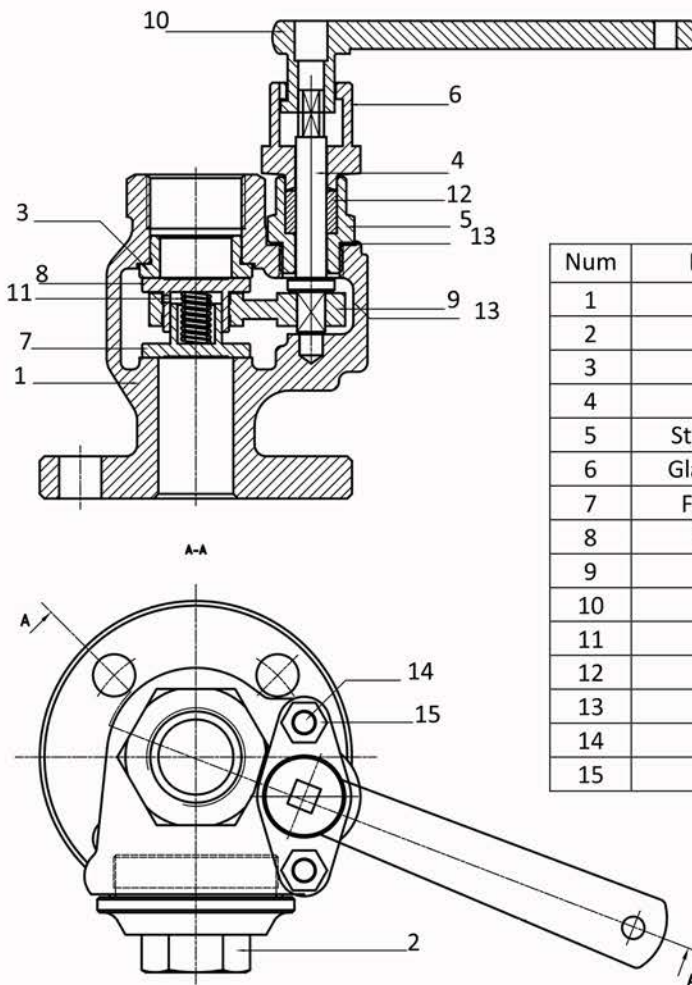
Size	Flange standard	S	L	A	E
1"	BS 10 Table F	1"	121	74.5	125.5
1 ¼"	BS 10 Table F	1 ¼"	149	77	138
1 ½"	BS 10 Table F	1 ½"	149	77	138

### Limiting Conditions

Pressure/temperature rating	Pressure (bar)	18.5
	temperature	Steam at saturated temp.

## Parallel Slide Blowdown Valve Link type for small boilers

### Material



Num	Part name	Material
1	Body	Bronze
2	Plug	Bronze
3	Seat	Alloy nickel
4	Stem	Stainless Steel
5	Stem Bushing	Brass
6	Gland bushing	Bronze
7	Female disk	Alloy nickel
8	Male disk	Alloy nickel
9	Linkage	Bronze
10	Wrench	Cast iron (GG25)
11	Spring	Stainless Steel
12	Packing	Teflon packing
13	Washer	Copper
14	Stud	Steel
15	Nut	Steel

### How to order

Connection size

working pressure and temperature: (bar, C)

## Key Operated Boiler Blowdown Valve

### Description

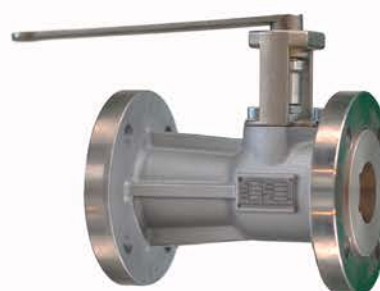
Designed for boiler blowdown applications.

The key cannot be removed when the valve is open, to ensure compliance with boiler regulations.

Operation : Manual , Actuator

Flanged connections.

spare parts are provided.



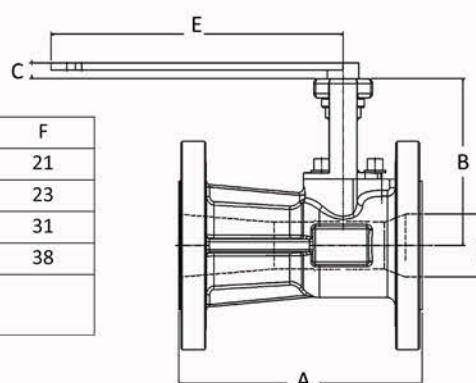
### Applications

SFV500 is specifically designed for :

boiler blowdown applications and where a timed blowdown system is not required.

### Sizes and pipe connections

Size	DN	A	B	C	E	F
1"	25	165	114	35	-	21
1-1/4"	32	178	117	35	-	23
1-1/2"	40	190	126	35	-	31
2"	50	216	134	35	-	38
Standard Key					258	



Dimensions are approximate and in mm.

Flange standard BS EN 1092, PN40

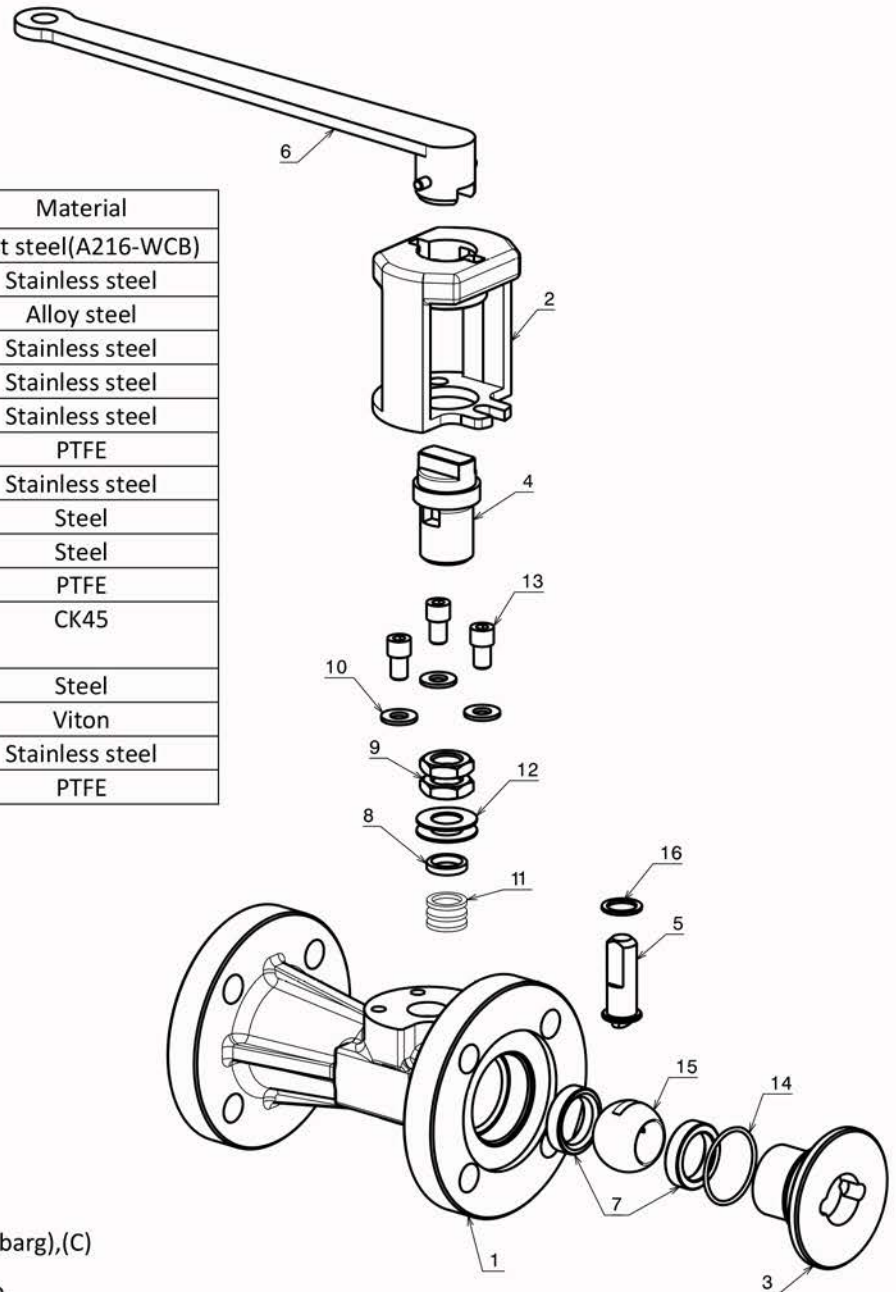
### Limiting Conditions

Max. allowable pressure	20 bar g
Cold hydraulic test pressure	60 bar g
Seat leakage test	6 bar g ( air under water )

## Key Operated Boiler Blowdown Valve

### Material

Num	Part name	Material
1	Body	Cast steel(A216-WCB)
2	Housing	Stainless steel
3	Inset	Alloy steel
4	Adaptor	Stainless steel
5	Stem	Stainless steel
6	Lever	Stainless steel
7	Seat	PTFE
8	Separator	Stainless steel
9	Hex. nut	Steel
10	Washer	Steel
11	Stem seal	PTFE
12	Conical spring washer	CK45
13	Socket heat (F.T.)	Steel
14	O-Ring	Viton
15	Ball	Stainless steel
16	Stem seal	PTFE



### How to order

BV 20

size : DN 25,32,40,50

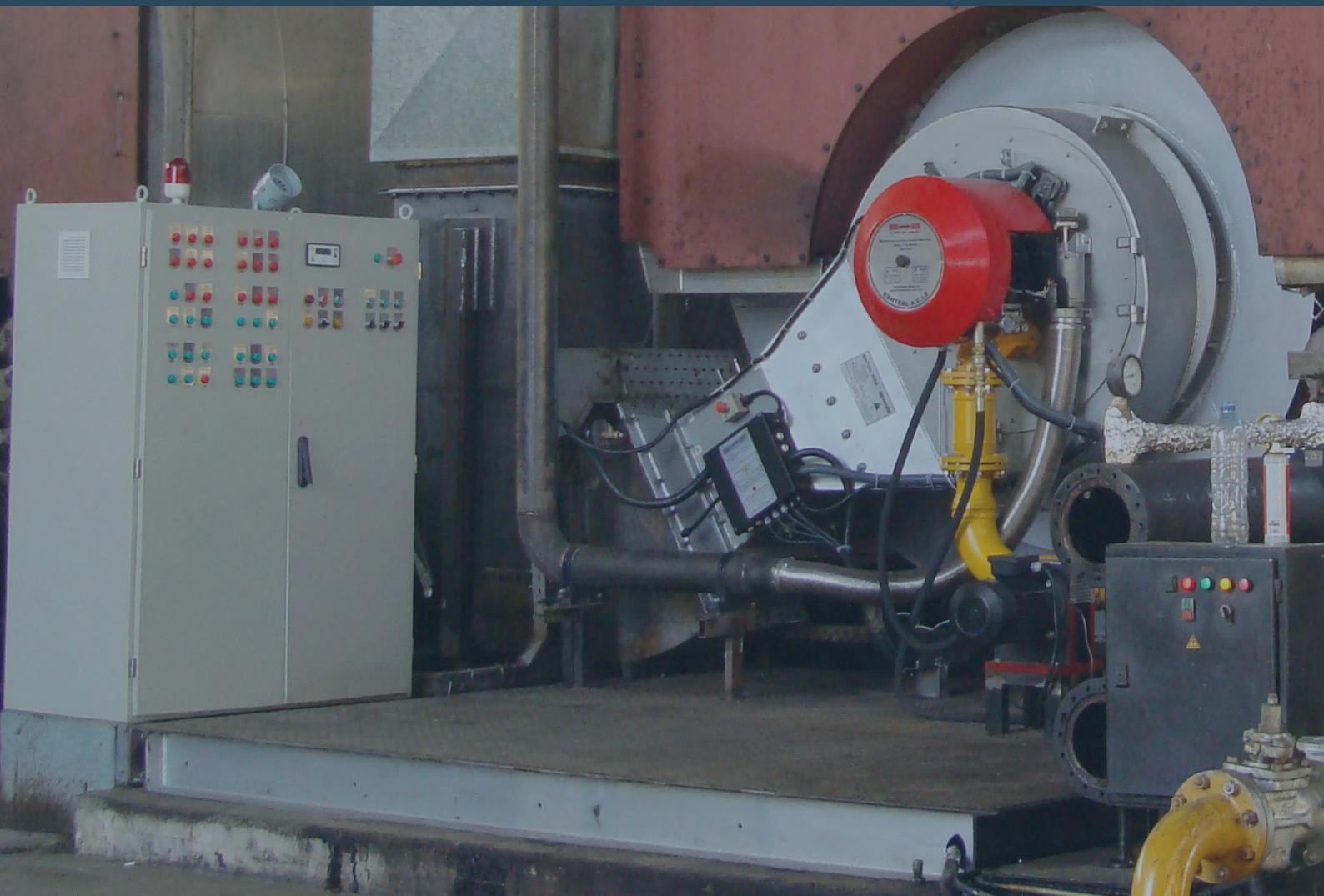
working pressure & temperature (barg),(C)

flange standard BS EN 1092, PN 40



A series of 30 horizontal lines for writing, spanning the width of the page.







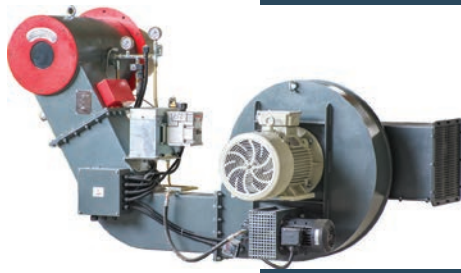
# BURNER

---

## ESHTEAL ARAK

INDUSTRIAL ENGINEERING CO.

<http://www.eshteal-arak.com>



## BURNER

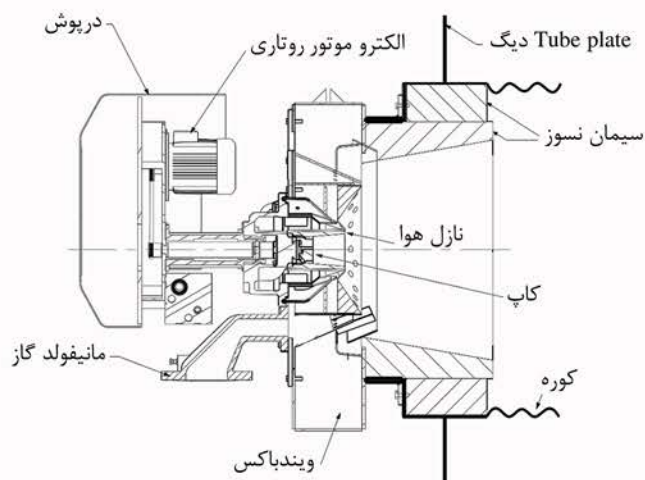
---

EW  
ERD  
PRD  
PRESSURE JET  
ECB  
EPB

## اصول عملکرد مشعل های روتاری کاپ EW- ERD- PRD

مشعل های روتاری کاپ (Rotary cup burner) یکی از انواع مشعل ها می باشد. از بزرگترین مزیت های این نوع از مشعل ها می توان به توان استفاده از چندین نوع سوخت با ویسکوزیته های مختلف را نام برد. سوخت این مشعل ها گاز، گازوییل، مازوت و... می باشد.

مشعل ها دارای دو نوع فن اولیه و ثانویه می باشند که فن اولیه دبی کم و فشار زیاد جهت اتمایز سوخت و فن ثانویه فشار متوسط و دبی زیاد جهت تامین هوای مورد نیاز احتراق می باشد. در این مشعل ها سوخت مایع به آرامی در فشار کم به کاپ در حال چرخش که با سرعت های 5600 تا 6000 rpm می چرخد وارد شده و تحت نیروی گریز از مرکز و به دلیل مخروطی بودن داخل کاپ از لبه کاپ به صورت ذرات ریز به داخل محفظه احتراق هدایت می شود. هوای فن اولیه از مجراهای اطراف کاپ (air nozzle) برخلاف جهت چرخش کاپ دمیده می شود که این اختلاف جهت حرکت موجب اتمیزه شدن سوخت و اختلاط مطلوب سوخت و هوا می شود. استفاده از موتور مستقل برای چرخاندن کاپ باعث کاهش بار وارده بر محور شافت شده و از اطمینان بیشتری برخوردار است.



نمای برش خورده ی مجموعه ی ویندباکس

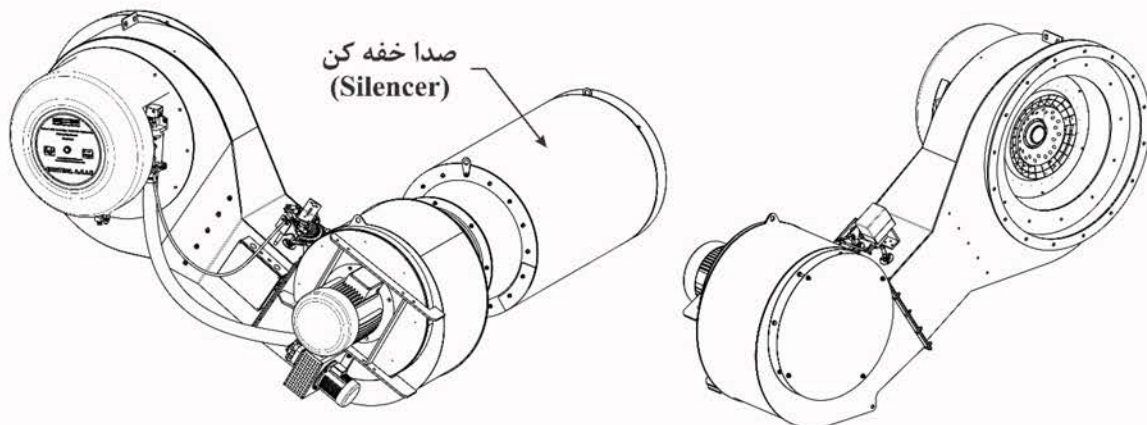
در روتاری کاپ ها کانال های جداگانه ای برای تامین هوای اولیه و ثانویه وجود دارد که توزیع مقدار هوا معمولاً شامل 15 تا 20 درصد برای هوای اولیه و 80 تا 85 درصد هوای ثانویه می باشد. همان گونه که ذکر شد این نوع از مشعل ها توانایی کار با سه نوع سوخت گاز، گازوئیل و مازوت را دارند و نیز قابلیت احتراق با کلیه سوخت های مایع پایه نفتی حتی با گرانیوی بالا و همچنین پسماندهای قابل اشتعال را نیز دارند.

از آنجا که طیف وسیعی از سوخت ها با گرانیوی های متفاوت می تواند به عنوان سوخت روتاری کاپ پذیرفته شود و این سیستم به فشار اتمیزه کردن نیاز ندارد، بنابراین نگه داری و تنظیم پیچیده ای ندارد، تنها با حداقل تنظیمات قابل راه اندازی است. از روتاری کاپ ها برای سوزاندن لجن نفت کوره و یا مایعات قابل اشتعال (مخلوط با درصدی آب) قابل استفاده می باشد.

## اصول عملکرد مشعل های روتاری کاپ EW- ERD- PRD

### مزیت های مشعل روتاری کاپ

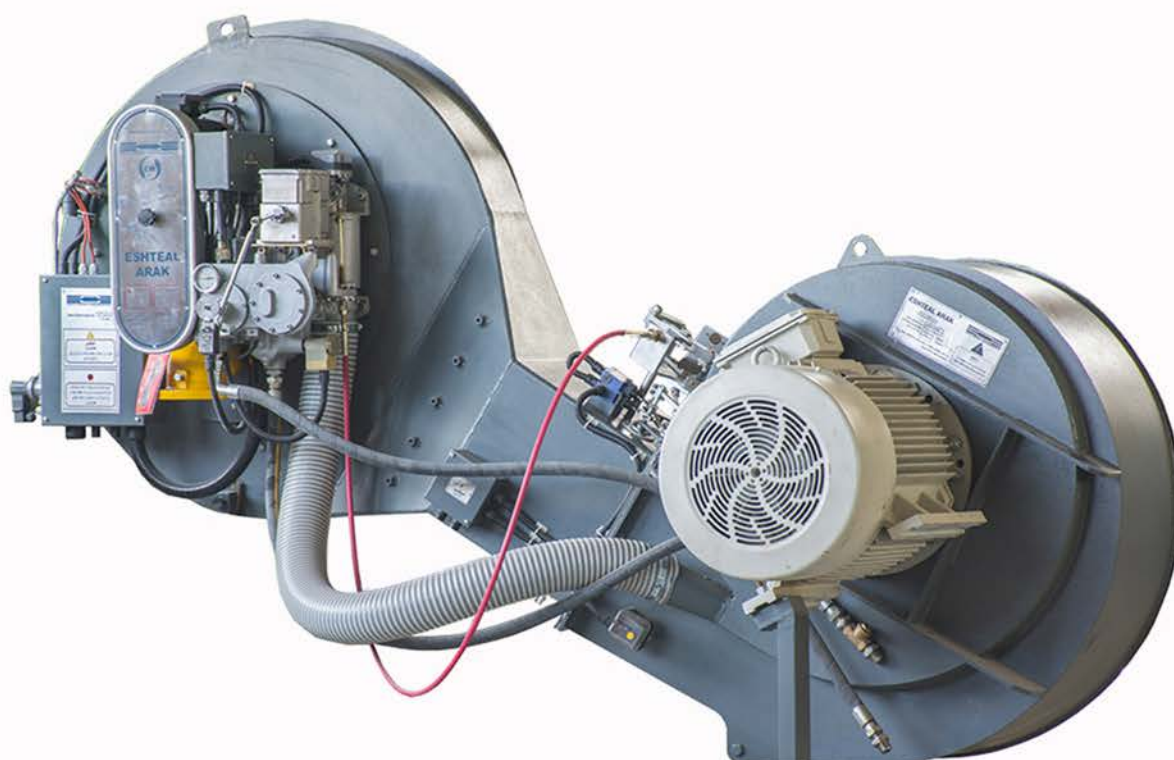
- با توجه به ساختار آن، در سوخت های با ویسکوزیته بالا به دلیل قطر زیاد سوراخ های نازل کمتر جرم می گیرد.
- نیاز به کمترین تنظیم زمانی که دو نوع سوخت متفاوت (گاز - سوخت مایع) را سوئیچ می کنید.
- تراوش کم در زمانی که فشار سوخت پایین باشد.
- احتراق کامل در هر محدوده
- صرفه جویی در مصرف سوخت به دلیل ترکیب مناسب سوخت و هوا
- برای سوخت های با ویسکوزیته بالا نیازی به بخار برای اتمیزه کردن نیست.
- امکان کاهش سطح صدا در صورت نصب صدا خفه کن (Silencer) فن و الکتروموتور
- طراحی Windbox به نحوی است که با وجود سرعت ثابت هوا، توزیع هوا و عملکرد مشعل در محدوده لود های مختلف را بهبود می بخشد که قابلیت نصب در جهت های مختلف را دارا می باشد.
- سطح تولید NOX پایین به نسبت مشعل های پرشرجت معمولی
- عملکرد صد در صد مدولار شعله
- تشکیل هندسه شعله مناسب تر به نسبت مشعل های جت فشار
- قابلیت تنظیم قطر و طول شعله نسبت به قطر و طول کوره دیگ
- به دلیل وجود پره های قابل تنظیم در ابتدای Windbox مسیر جریان هوا و متناسب به آن شکل شعله قابل کنترل است.
- این نوع مشعل قابل استفاده برای انواع دیگ های بخارواتر تیوب و فایر تیوب ، آب داغ ، آب گرم و روغن داغ با ظرفیت بالا بوده که انتخابی مناسب و عالی جهت این دیگ ها می باشد.



## مشعل های سری EW

مشعل های EW در بویلر های واتر تیوپ، فایرتیوپ بخار، آب گرم، آب داغ، روغن داغ و کوره های خشک کن تا توان 14.5MW استفاده می شود که دارای ویژگی های زیر می باشد.

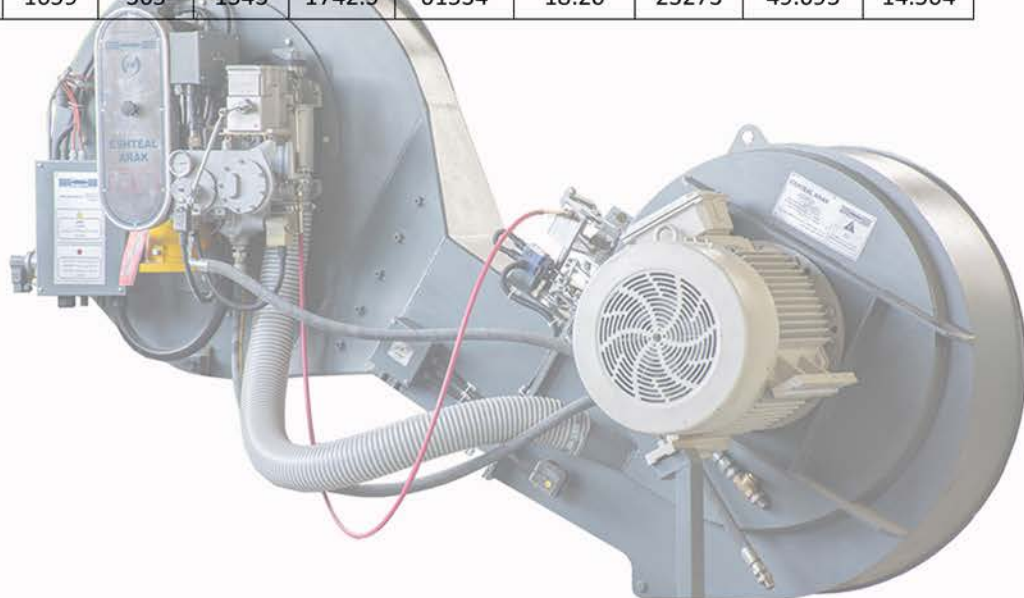
- افزایش انعطاف پذیری با استفاده از موتور های جدا برای پودر کنندگی سوخت، فن هوای اصلی مشعل برای مدل های دوگانه سوز گاز-گازوئیل و مازوت .
- بهبود توزیع هوا و افزایش کارایی در تمام طیف کاری
- سرعت متوسط هوا در ویندباکس
- امکان کاهش صدای مشعل با استفاده از صدا خفه کن (Silencer) برای فن و الکتروموتور
- کارکرد عالی با سوخت های مایع وضایعات قابل اشتعال
- کارکرد مشعل با راندمان 80 %



## مشعل های سری EW

جدول ظرفیت مشعل های Rotary cup شامل مدل های EW

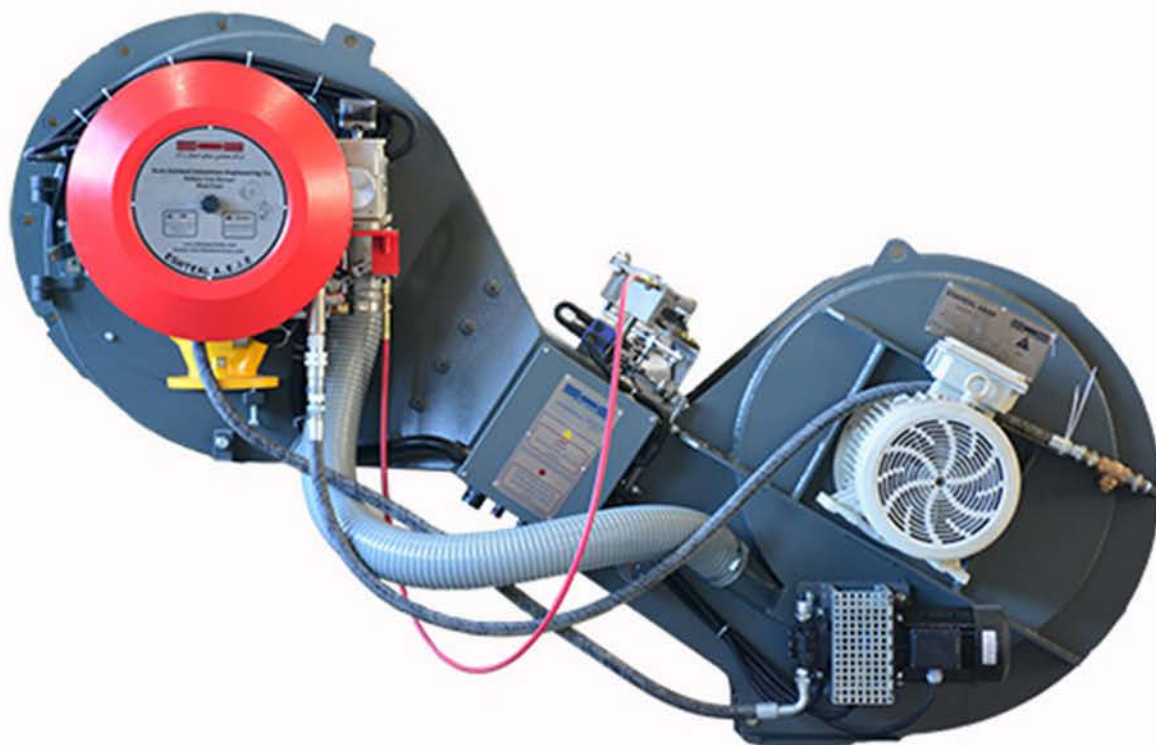
Burner model	Max. Fuel requirements					Thermal output	Boiler output @ 80% Gross efficiency		
	Fuel Oil			Gas			Steam F & at 100°C	Hot water	
	Liters Per hr	Imp Per hr	Kg Per hr	m <sup>3</sup> Per hr	ft <sup>3</sup> Per hr	MW			
EW 5	170	37.5	159	179.0	6322	1.87	2391	5.106	1.498
EW 7	200	50.0	211	238.7	8429	2.49	3188	6.808	1.995
EW 8	284	63	264	298.4	10537	3.11	3985	8.509	2.494
EW 10	341	75.0	317	358.0	12644	3.74	4782	10.211	2.993
EW 11	375	82.5	348	393.8	13908	4.11	5260	11.232	3.292
EW 12	414	91	385	434.4	15341	4.53	5802	12.390	3.631
EW 15	496	109	461	520.3	18376	5.43	6950	14.840	4.349
EW 17	577	127	537	606.3	21411	6.33	8098	17.291	5.067
EW 20	659	145	613	692.2	24445	7.23	9245	19.742	5.786
EW 22	741	163	689	778.1	27480	8.13	10393	22.192	6.504
EW 25	827	182	769	868.8	30683	9.07	11605	24.779	7.262
EW 30	996	219	826	1045.5	36921	10.92	13964	29.817	8.738
EW 35	1155	254	1074	1212.6	42821	12.66	16196	34.582	10.135
EW 40	1318	290	1226	1384.4	48890	14.46	18491	39.484	11.571
EW 45	1491	328	1387	1565.8	55296	16.36	20914	44.657	13.087
EW 50	1659	365	1543	1742.5	61534	18.20	23273	49.695	14.564



## مشعل های سری ERD

این محصول از نظر ساختار کلی مشابه EW بوده و با تغییرات جزئی صورت گرفته در این مشعل دارای ویژگی های زیر می باشد:

- قطعات اضافه شده به ERD شامل اینورتر سوخت و بلوک سوخت ساده تر
- توانایی بالا بردن حداکثر دمای سوخت مازوت تا  $110^{\circ}\text{C}$  جهت اتمایز بهتر و افزایش راندمان
- حداقل خطای ممکن جهت پودر سوخت به دلیل عملکرد دو موتور برنر (سهولت کارکرد)
- کنترل دور پمپ توسط سنسور پالس متر و ایجاد یک دور ثابت
- امکان استفاده از دمپرموتور 4-20 میلی آمپر به جای نوع پتانسیومتری
- سهولت کارکرد اپراتور مشعل
- عدم نیاز به شمعک یونازاسیون گاز به علت وجود سیستم جرقه زن (PILOT)
- امکان کاهش صدای مشعل با استفاده از صدا خفه کن (Silencer) برای فن و الکتروموتور
- کارکرد مشعل با راندمان 83 %

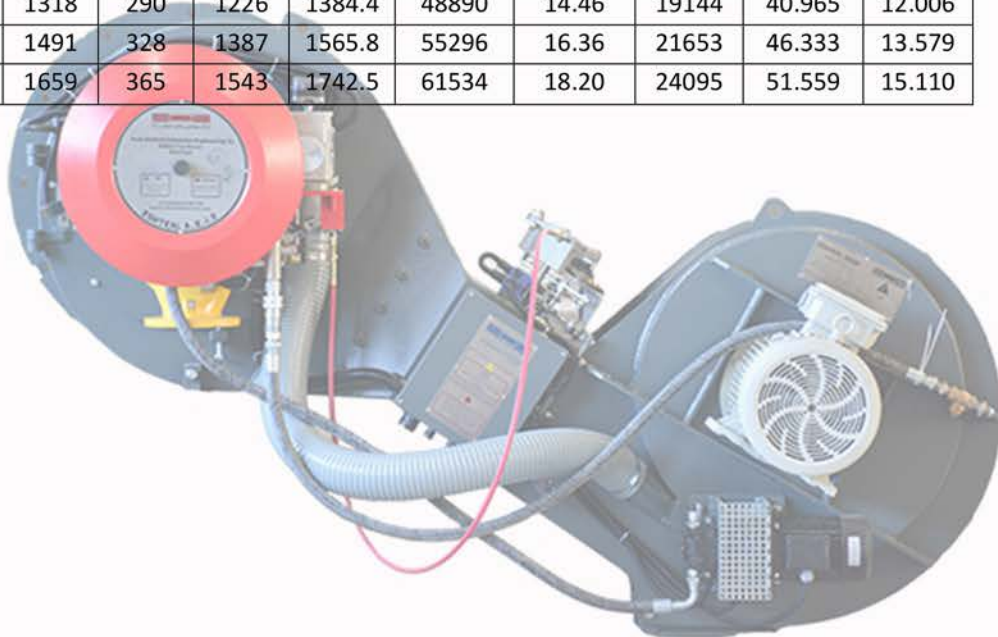




## مشعل های سری ERD

جدول ظرفیت مشعل های Rotary cup شامل مدل های ERD

Burner model	Max. Fuel requirements					Thermal output	Boiler output @ 83% Gross efficiency		
	Fuel Oil			Gas			Steam F & at 100°C	Hot water	
	Liters Per hr	Imp Per hr	Kg Per hr	m <sup>3</sup> Per hr	ft <sup>3</sup> Per hr		MW	Kg Per hr	
ERD 5	170	37.5	159	179.0	6322	1.87	2476	5.297	1.552
ERD 7	227	50.0	211	238.7	8429	2.49	3301	7.063	2.070
ERD 8	284	62.5	264	298.4	10537	3.11	4126	8.829	2.587
ERD 10	341	75.0	317	358.0	12644	3.74	4951	10.594	3.105
ERD 11	375	82.5	349	393.8	13908	4.11	5446	11.654	3.415
ERD 12	414	91	385	434.4	15341	4.53	6007	12.854	3.767
ERD 15	496	109	461	520.3	18376	5.43	7196	15.397	4.512
ERD 17	577	127	537	606.3	21411	6.33	8384	17.940	5.258
ERD 20	659	145	613	692.2	24445	7.23	9572	20.482	6.003
ERD 22	741	163	689	778.1	27480	8.13	10760	23.025	6.748
ERD 25	827	182	769	868.8	30683	9.07	12015	25.709	7.535
ERD 30	996	219	826	1045.5	36921	10.92	14457	30.935	9.066
ERD 35	1155	254	1074	1212.6	42821	12.66	16768	35.879	10.515
ERD 40	1318	290	1226	1384.4	48890	14.46	19144	40.965	12.006
ERD 45	1491	328	1387	1565.8	55296	16.36	21653	46.333	13.579
ERD 50	1659	365	1543	1742.5	61534	18.20	24095	51.559	15.110



## مشعل های سری PRD

این مشعل ها نسل جدیدی از مشعل های روتاری کاپ بوده است که مجهز به سیستم کنترل هوشمند می باشند.

این مشعل ها نسبت دو مدل قبل (ERD, EW) دارای مزایای ذیل می باشد:

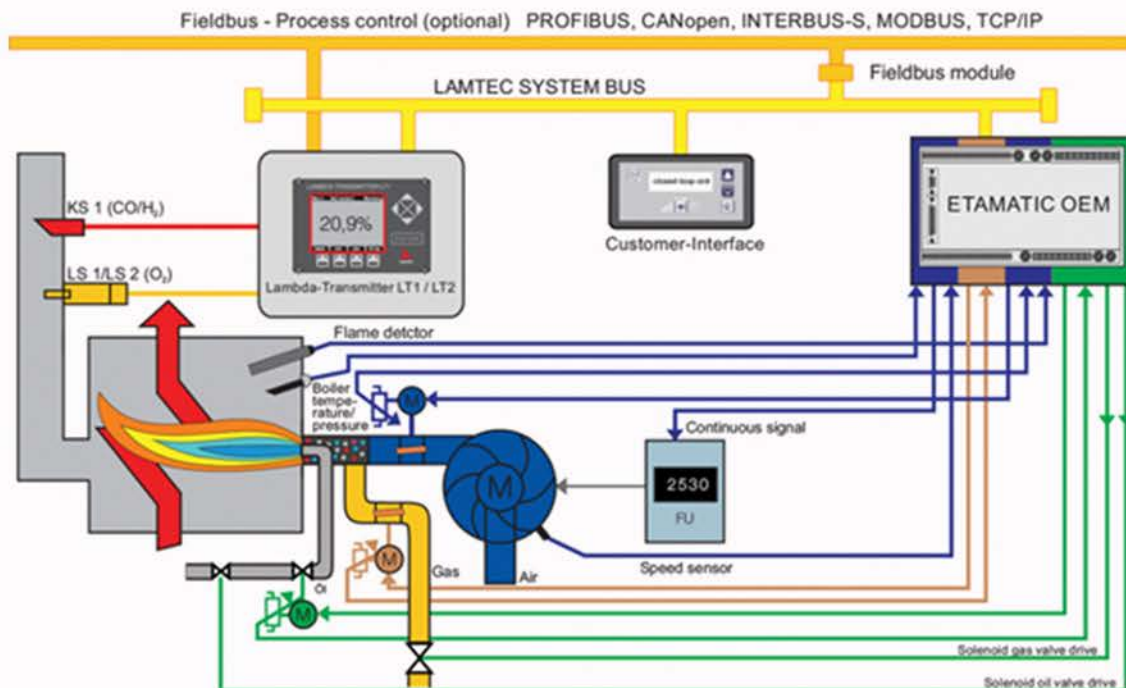
- توانایی بالا بردن حداکثر دمای سوخت مازوت تا  $110^{\circ}\text{C}$  جهت اتمایز بهتر و افزایش راندمان
- امکان کاهش صدای مشعل با استفاده از صدا خفه کن (Silencer) برای فن و الکتروموتور
- دارای سیستم تست نشتی خط گاز
- دارای کنترل بار مشعل با استفاده از PID کنترل
- کاهش قطعات مکانیکی و تنظیم دقیق تر نسبت سوخت و هوا
- استفاده از سروموتورهای مجزا بر روی مسیر هوای اولیه و ثانویه و خط گاز
- کنترل دور پمپ سوخت توسط سنسور RPM
- پایش و بهبود شرایط احتراق و افزایش راندمان با استفاده از آنالیزهای  $\text{CO}$  و  $\text{O}_2$
- دارای سیستم خطایاب
- قابلیت اتصال به سیستم کنترل مرکزی از طریق گذرگاه اطلاعات Profibus
- دارای سیستم کنترل دور فن هوای ورودی مشعل



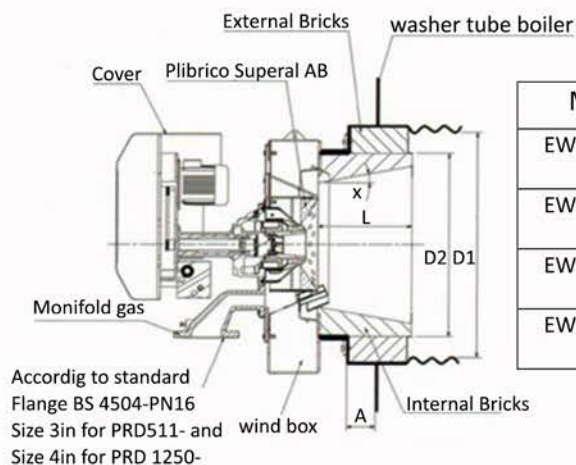
## مشعل های سری PRD

تشریح عملکرد سیستم کنترل احتراق

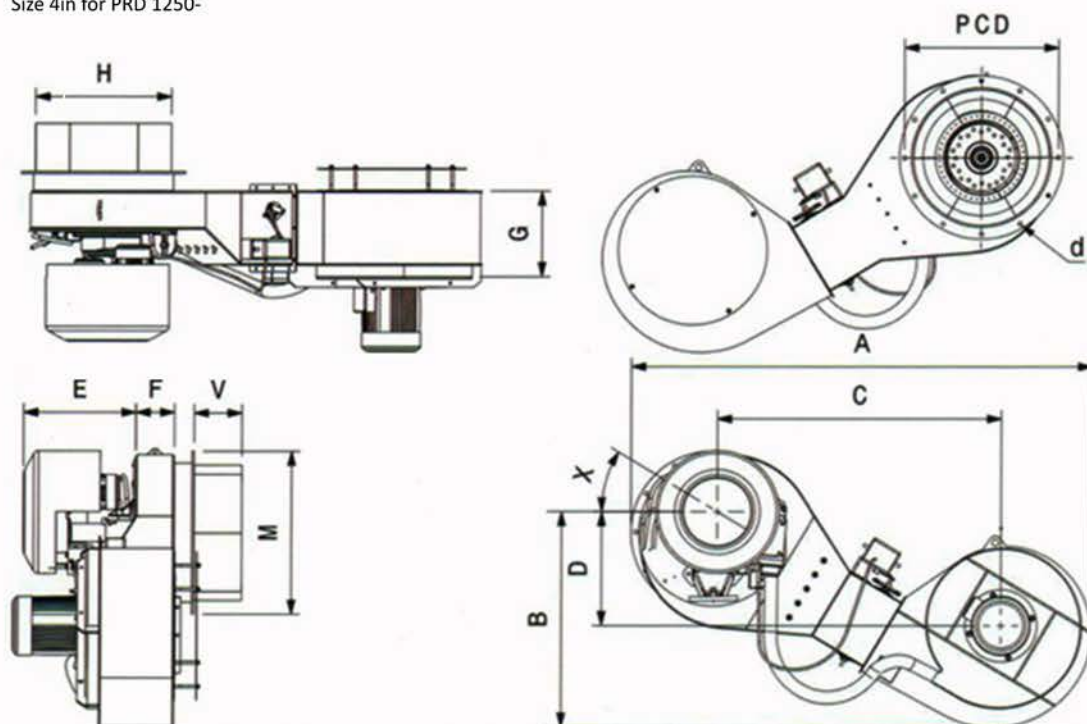
سیستم کنترل احتراق شامل کنترلر، عملگرهای سوخت و هوا، سنسور و آنالایزر گازهای خروجی (CO/O<sub>2</sub>) می باشد. عملگرهای سوخت و هوا شامل سروموتورهایی است که بر روی مسیر هوای اولیه، ثانویه و خط گاز قرار میگیرند و همچنین اینوترهایی که جهت کنترل دور الکتروموتور فن و پمپ سوخت به کار می روند. جهت کارکرد آسان اپراتور، یک پنل نمایشگر در سیستم در نظر گرفته شده است که از طریق آن می توان نقطه تنظیم پارامتر دما (دیگ آب گرم) یا فشار (دیگ بخار) را تغییر داد همچنین به صورت دستی میزان شعله را کم و زیاد نمود. علاوه بر این قابلیت نمایش خطاهای سیستم جهت رفع اشکال آسان تر را نیز دارا می باشد. در این سیستم جهت هر نوع سوخت منحنی های جداگانه سوخت و هوا تنظیم می گردد که در هر زمان فقط با تغییر سوئیچ، به راحتی و بدون هیچ گونه تنظیم مجدد می توان نوع سوخت را تغییر داد.



## مشعل های مشعل Rotary cup



Model	A	D1	D2	L	X
EW-ERD-PRD 5-11	124	822	630	324	10°
EW-ERD-PRD 12-20	152.5	990	730	356	10°
EW-ERD-PRD 22-30	106	1296	862	318	10°
EW-ERD-PRD 35-50	102	1454	857	318	10°



Mode	A	B	C	D	E	F	G	H	M	V	X	Ho. N.	d	PCD
EW-ERD-PRD 5-11	2110	952	1288	478	525	180	415	630	765	224	32°	12	18	720
EW-ERD-PRD 12-20	2381	1022	1449	466	525	200	415	730	865	256	32°	12	18	814
EW-ERD-PRD 22-30	2635	1106	1640	470	525	220	460	862	992	218	32°	12	18	941
EW-ERD-PRD 35-50	2895	1249	1762	610	525	314	590	857	1210	218	32°	18	18	1144

## مشعل های جت فشار EW

این مشعل ها در سه مدل دو نازله، مدولار مکانیکی و مدولار با سیستم کنترل احتراق می باشند.  
مشعل های جت فشار دو نازله و مدولار مکانیکی جهت نصب روی دیگهای بخار فایرتیوپ-آبگرم آب داغ و روغن داغ و کوره های خشک کن با حداکثر توان 0.7-3 MW را دارا می باشد.  
طرح یکپارچه محفظه فن و کانال هوا با بدنه ریخته گری آلومینیومی  
حذف کامل نشتی توسط طرح یکپارچه بلوک سوخت  
قابلیت تنظیم نهایی راستای شعله درون کوره توسط سه عدد پیچ بدون نیاز به باز کردن مشعل  
استفاده از ترانس های جرعه با قابلیت برقراری قوس پایدار در سیکل های متوالی  
بالانس کامل فن هوا جهت کاهش لرزش های احتمالی صدای ناشی از آن

Burner type	input				Output based 80% efficiency				
	Eel power		Fuel consumption		Hot water		Steam 100°C		Power
	A	KW	Oil (l/hr)	Gas (m <sup>3</sup> /hr)	Million Kcal/hr	Million BTU/hr	Lb/hr	Kg/hr	Power (mw)
EW2.4	13.7	5.2	45-100	60-110	0.6-1.0	2.38-3.96	1368-2602	620-1180	0.7-1.17
EW 3.5	15.7	6	60-140	70-170	0.8-1.5	3.17-5.95	1820-4002	825-1815	0.93-1.75
EW 4.4	15.7	6	70-165	90-190	1.1-2.0	4.36-7.93	2070-4785	940-2170	128-2.33
EW 6.2	20.6	7.8	100-250	110-290	1.4-2.4	5.55-9.52	2780-7120	1260-3230	1.63-2.8
EW 7.5	22.5	8.6	145-310	170-350	1.9-2.7	7.5-10.7	4211-9090	1910-4122	2.21-3.1
EW 8.7	22.5	8.6	180-390	210-440	2.3-2.9	9.12-11.5	5320-1121	2412-5085	2.66-3.3

مشعل جت فشار مدولار مکانیکی



با سوخت گاز، گازوئیل و مازوت

سیستم پیش گرم کن مازوت



مشعل جت فشار دونازله با سوخت گاز و گازوئیل

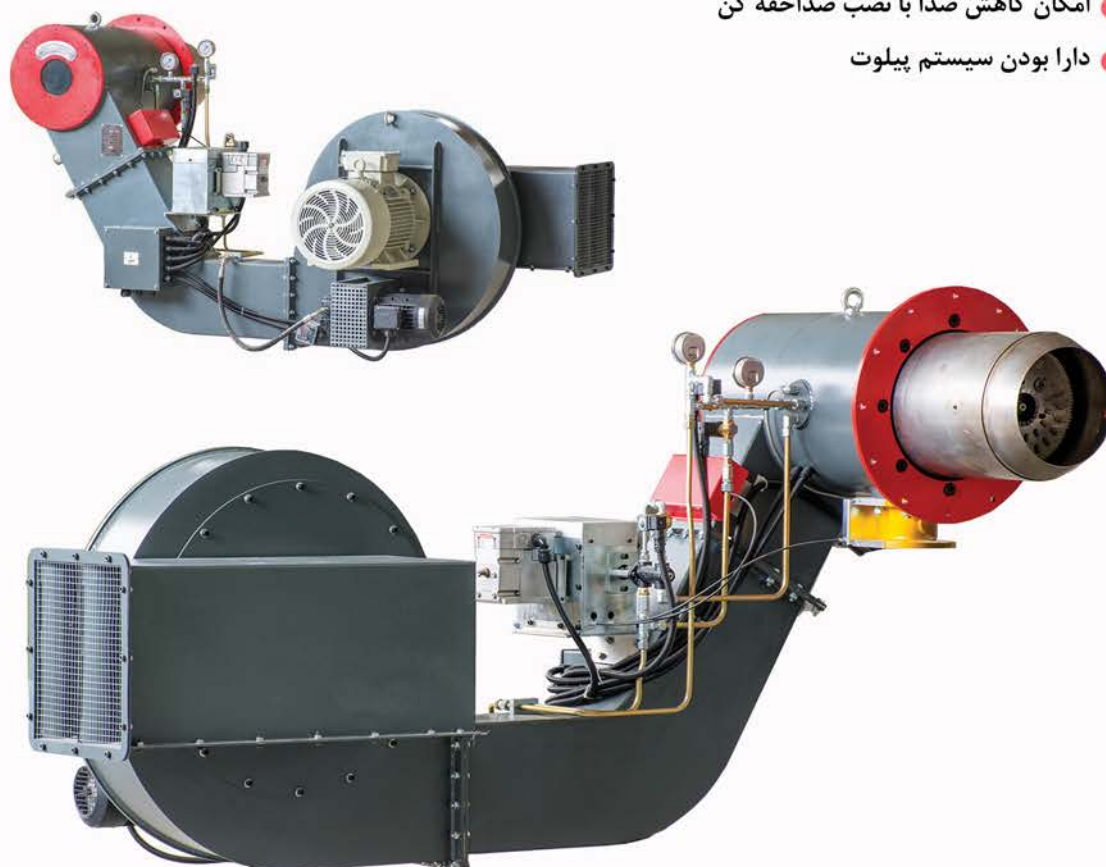


## مشعل های جت فشار ECB

مشعل جت فشار ECB در دو مدل مدولار مکانیکی و مدولار با سیستم کنترل احتراق که به صورت تک نازل است می باشند.

مشعل جت فشار ECB جهت نصب روی دیگهای بخار واتر تیوپ و فایرتیوپ-آبگرم آب داغ و روغن داغ و کوره های خشک کن می باشد.

- مدل ECB با رنج ظرفیتی از 0.9-31 MW
- قابلیت کارکردن با رله LFL و دمپر موتور Honeywell
- قابلیت کار کردن با سیستم کنترل مشعل و کنترل CO/O<sub>2</sub> با سطح CO کمتر از 10 ppm و O<sub>2</sub> حدود 3%
- امکان مشاهده ی پیش روی شعله با وجود شیشه ی روی مشعل
- دارای کاور دمنده ی مخروطی سر مشعل و دیفیوزر استنلس استیل
- قابلیت تنظیم دیفیوزر برای عملکرد بهتر
- انعطاف مشعل درمورد محل قرار گیری فن
- عملکرد با سوخت گاز و مایع
- امکان کاهش صدا با نصب صداخفه کن
- دارا بودن سیستم پیلوت



## مشعل های جت فشار مدولار با سیستم کنترل احتراق

مشعل های جت فشار (EW - EPB - ECB) قابلیت هم خوان شدن با سیستم کنترل احتراق را دارا می باشند. به این ترتیب با استفاده از یک کنترلر و قرار دادن سروموتور یا استپ موتور بر روی مشعل می توان تنظیم دقیقی بر روی سوخت و هوا انجام داد و با استفاده از آنالایزر گاز های خروجی اگزوز (O<sub>2</sub>/CO) کاهش مصرف سوخت و کاهش گازهای آلاینده را ایجاد نمود.

