

**HIGH TEMPERATURE  
HIGH PRESSURE  
CONTROL VALVES  
1-4470 SERIES**

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## HIGH TEMPERATURE HIGH PRESSURE CONTROL VALVES 1-4470 SERIES

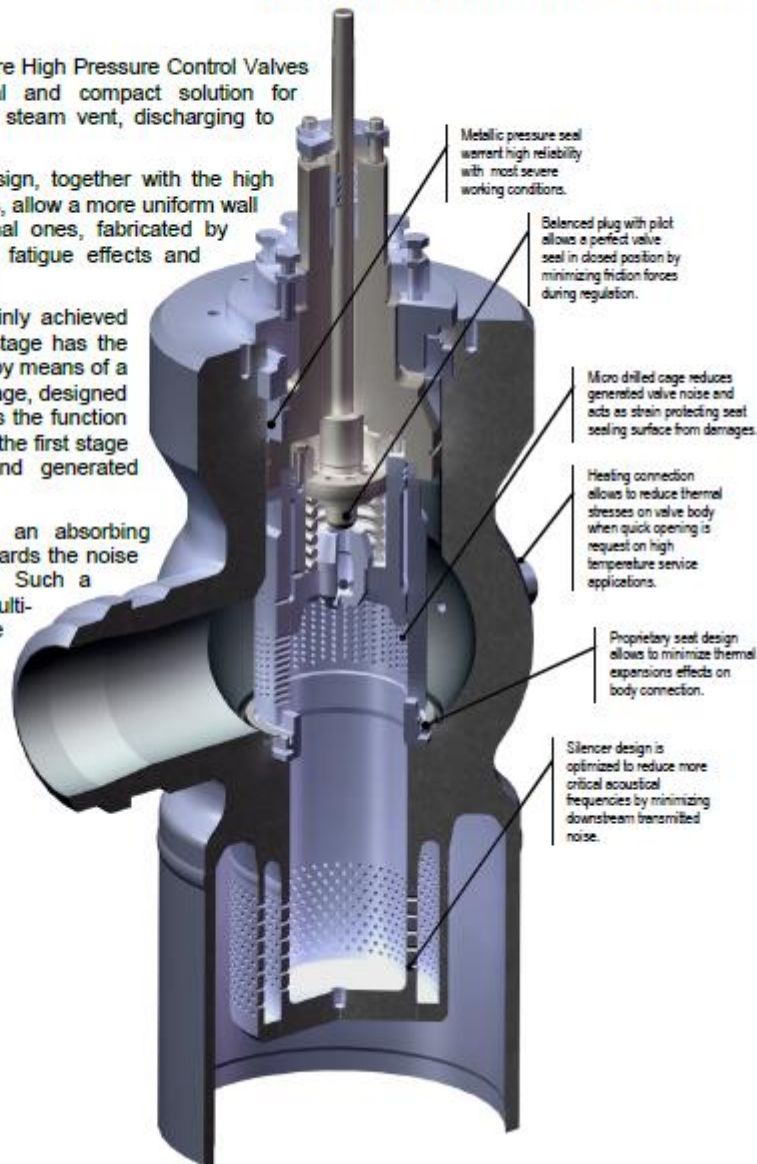
### DESCRIPTION

Parcol 1-4470 High Temperature High Pressure Control Valves represent the most universal and compact solution for pressure reduction service on steam vent, discharging to atmospheric silencers.

The spherical body shape design, together with the high quality of construction materials, allow a more uniform wall thickness than the conventional ones, fabricated by welding bodies, reducing P/T fatigue effects and improving welded joints quality.

The pressure reduction is mainly achieved through two stages: the first stage has the function to adjust the flow rate by means of a drilled cage trim, the second stage, designed with fixed throttling section, has the function to generate a backpressure on the first stage by reducing fluid velocity and generated sound pressure level.

The second stage has also an absorbing function, acting as silencer towards the noise generated by the first stage. Such a function is remarkable in multi-cage figures, where the clearance between silencer is optimized to reduce noise frequencies between 1kHz to 4kHz, or when a Limiphon disk stack is installed as a silencer.

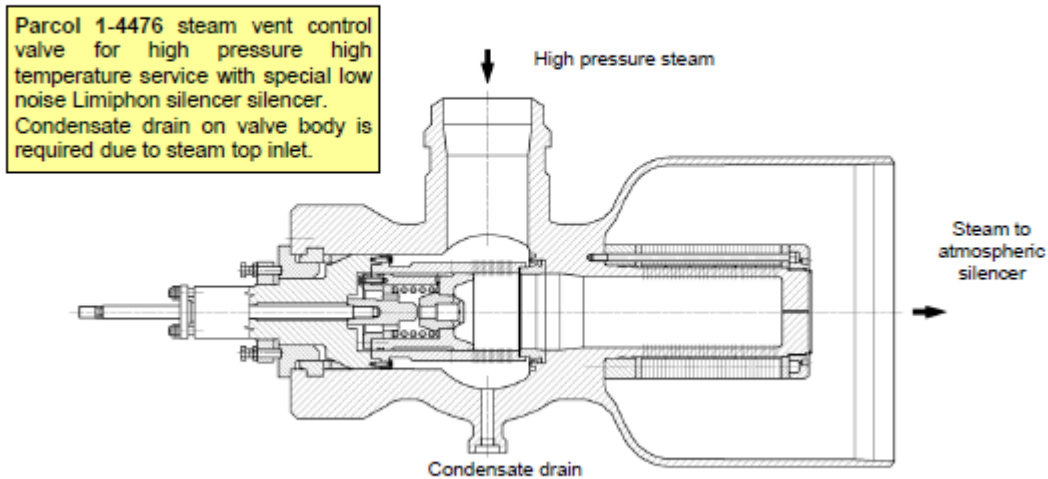
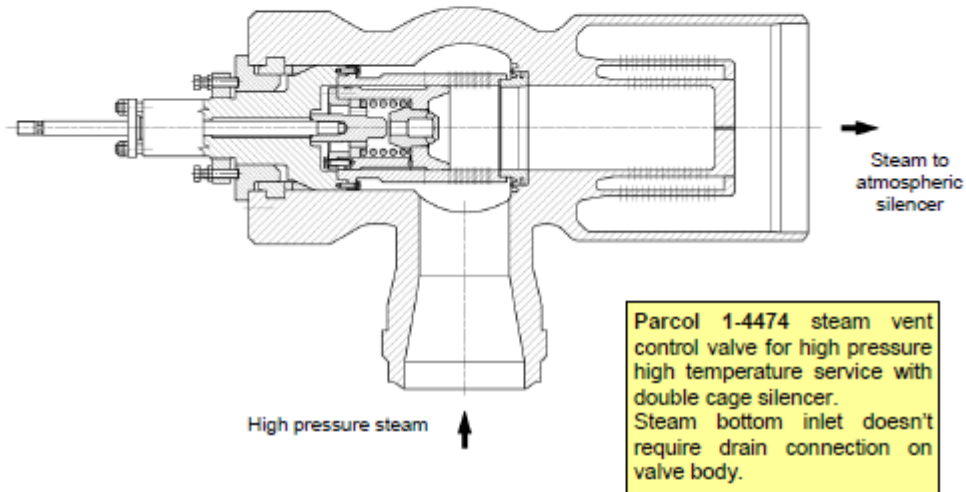


## APPLICATIONS

Parcol 1-4470 Series control valves are widely used as steam vent to atmosphere for critical applications where high reliability, low noise, perfect sealing are request.

Usually a final silencer to atmosphere producing moderate backpressure is installed. To reduce valve and downstream piping dimension in order to optimize installation cost Parcol 3-9811 Limiphon resistor producing elevated backpressure can be installed.

1-4470 series combined with 1-5700 are also suitable for on-off service (see 1-5700 PRDS bulletin).





## DESIGN FEATURES

### Body

- manufactured from fully machined forgings with welded inlet connection;
- available sizes according to service conditions;
- ratings: up to ANSI 2500 (up to ANSI 4500 on request).

### Bonnet

- up to ANSI 600: flanged bonnet;
- over ANSI 600: pressure seal.

### Trim

- cage-guided balanced plug with pilot;
- first pressure reduction stage is performed by a specially drilled cage;
- seat ring is welded to the body through an easily removable tension free lip-seal;
- quick change seat ring is available on request as special construction.

### Silencer

- two different designs are available:
  - 1 to 3 stages diffuser;
  - LIMIPHON silencer.
- the silencer is usually welded to valve body, however, when quick change seat ring is provided, the silencer is clamped between body and seat and can be removed through the bonnet cavity.

### Materials of construction

- body and bonnet are usually made of carbon steel and CrMo alloy steels according to line class;
- trim parts are usually made of nitrided or stellite F6NM alloy steel;
- silencer is normally made of CrMo alloy steel, while LIMIPHON stack is normally made of AISI 430 or 12Cr special stainless steel for temperature above 400°C.

### Leakage class (according to IEC 60534-4)

- up to class V both for balanced and unbalanced plug.

### Packing

- Parcol GRF pure graphite packing specially designed for control application is supplied. Parcol GRF packing provides bi-directional tightness and it is therefore suitable also when vacuum seal is required.

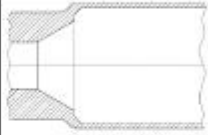
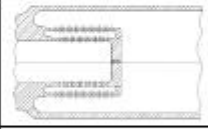
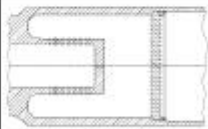
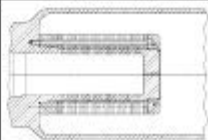


#### To atmospheric silencer valve 1-4474

- Inlet: DN 16" ANSI 150 BW
- Outlet: DN 18" ANSI 150 BW
- Port: 16"

Body material: SA182 F91 / SA182 F22

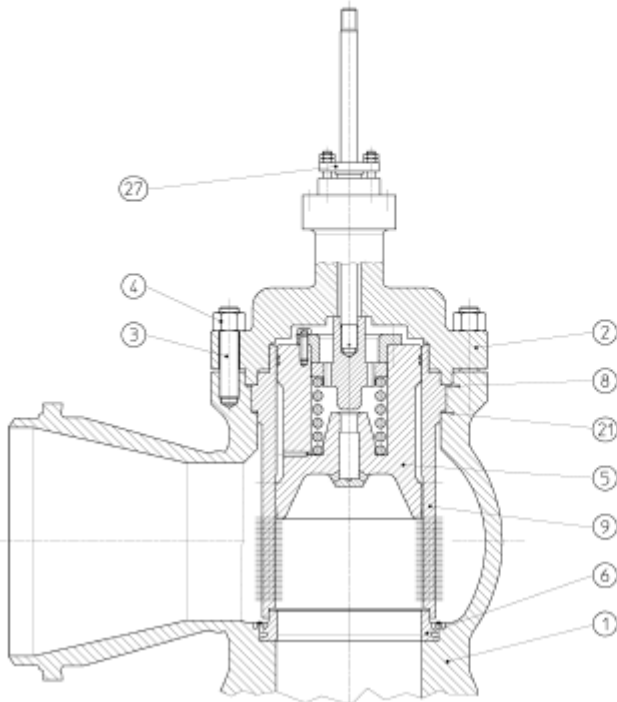
## NUMBERING SYSTEM

1		-		4		4		7		X		X							
<table border="1"> <thead> <tr> <th colspan="2">OPTIONS</th> </tr> </thead> <tbody> <tr> <td>QS</td> <td>Quick change Seat</td> </tr> <tr> <td>QL</td> <td>Quick change Seat and Limiphon silencer (1-4476 only)</td> </tr> </tbody> </table>														OPTIONS		QS	Quick change Seat	QL	Quick change Seat and Limiphon silencer (1-4476 only)
OPTIONS																			
QS	Quick change Seat																		
QL	Quick change Seat and Limiphon silencer (1-4476 only)																		
<b>DOWNSTREAM SILENCER TYPE</b>																			
0	undefined												--						
3	without silencer																		
4	disk or drilled basket type silencer																		
5	HAS reactive absorption silencer																		
6	Limiphon disk stack silencer																		



## SECTIONAL DRAWINGS

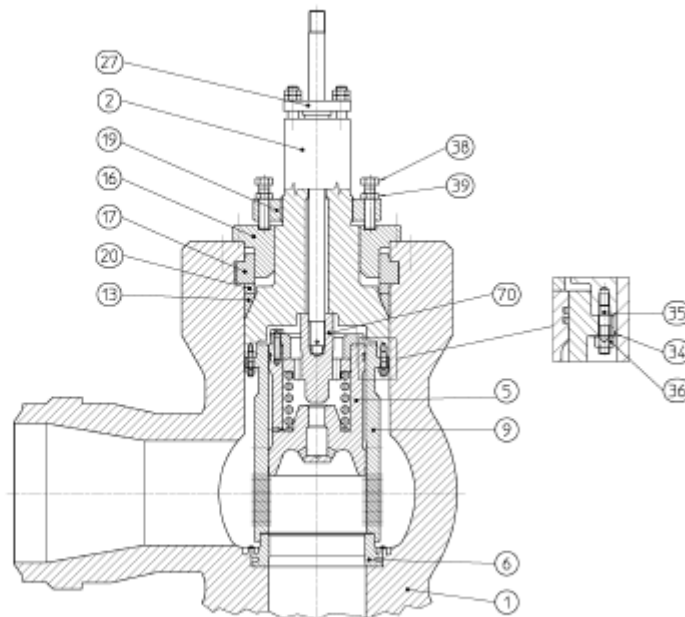
Flanged Body – Bonnet connection  
ANSI 150 ÷ 600



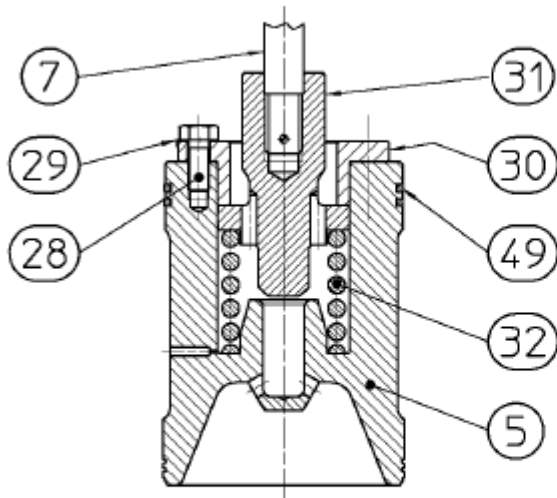
ITEM	PART NAME
1	BODY
2	BONNET
3	STUD
4	NUT
5	PLUG
6	SEAT
8	GASKET
9	CAGE
21	GASKET
27	PACKING BOX

Pressure Seal – Bonnet connection  
ANSI 900 ÷ 2500

ITEM	PART NAME
1	BODY
2	BONNET
5	PLUG
6	SEAT
9	CAGE
13	SEAL RING
16	FLANGE
17	RETAINING RING
19	RING NUT
20	SPACER
27	PACKING BOX
34	STOP RING
35	STUD
36	NUT
38	SCREW
39	NUT



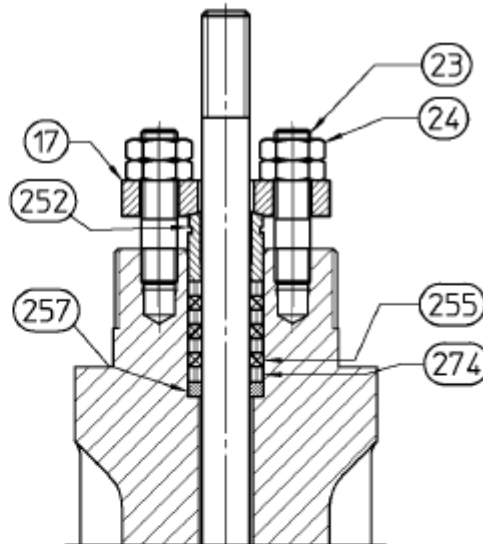
**Balanced Plug with Pilot**  
ANSI 150 ÷ 2500



ITEM	PART NAME
5	PLUG
7	STEM
28	SCREW
29	STOP RING
30	FLANGE
31	PILOT
32	SPRING
49	SEAL RING

**GRF – Pure Flexible Graphite Packing**  
Ratings: ANSI 150 ÷ 2500

ITEM	PART NAME
17	PACKING FLANGE
23	STUD
24	NUT
252	PACKING FOLLOWER
255	PACKING RING
257	END RING
274	INTERMEDIATE RING



**Spare parts**

ITEM	PART NAME	STARTUP <sup>(1)</sup>	STRATEGIC <sup>(2)</sup>
8	GASKET	X	X
13	SEAL RING	X	X
21	GASKET	X	X
50 (5-28-29-30-32-49)	PLUG ASSEMBLY		X
70 (7-31)	STEM-PILOT ASSEMBLY		X
255	PACKING RING	X	
274	INTERMEDIATE RING	X	

<sup>(1)</sup> commissioning and start-up suggested spare parts  
<sup>(2)</sup> two years suggested spare parts



## MATERIALS OF CONSTRUCTION

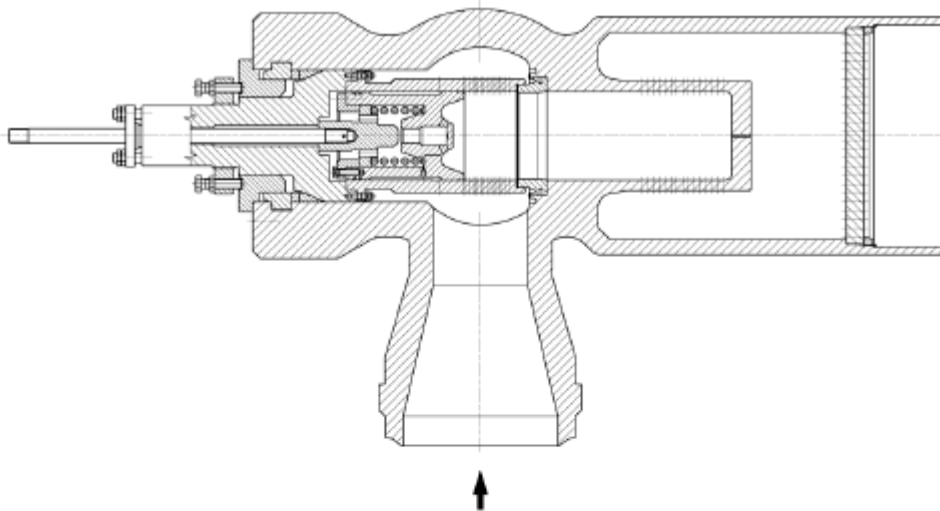
ITEM	PART NAME	Basic Class / Temperature range		
		A (-29 / +427 °C)	D (-29 / +566 °C)	V (-29 / +593°C)
1	BODY	SA 105 / SA 350 LF2 <sup>(1)</sup>	SA182 F22 Cl.3	SA 182 F91
2	BONNET			
3	STUD	SA 193 B7	SA 479 XM-19	
4	NUT	SA 194 Gr.4	SA 194 Gr.8	
5	PLUG	SA 182 F6NM Nitrided		
6	SEAT	A182 F6NM Seat joint stellite		
8	GASKET	AISI 321+GRAPHITE		
9	CAGE	A 351 CA6NM Nitrided		
12	PIN	A 479 316		
13	SEAL RING	A 479 316		
14	GASKET	AISI 321+GRAPHITE		
15	ADAPTER	SA 105 / SA 350 LF2	SA182 F22 Cl.3	SA 182 F91
16	FLANGE	SA182 F22 Cl.3		
17	RETAINING RING	A 182 F91 Nitrided		
19	RING NUT	A 182 F6NM Nitrided		
20	SPACER	A 182 F91		
21	GASKET	AISI 321+GRAPHITE		
25	PLATE	A 479 304		
26	SCREW	A2-70 EN ISO 3506		
27	PACKING	SEE PACKING SUB-CLASS		
28	SCREW	A2-70 EN ISO 3506		
29	STOP WASHER	A 479 304 ANNEALED		
30	FLANGE	A182 F6NM HARDENED 240-300 HB		
32	SPRING	INCONEL X-750 T.T.T.		
34	STOP WASHER	A 479 304 ANNEALED		
35	STUD	SEE NOTE (3)		
36	NUT	SA 194 Gr.8		
38	SCREW	A2-70 EN ISO 3506		
39	NUT	SA 194 Gr.8		
49	SEAL	A182 F6NM HARDENED 240-300 HB		
70	STEM + PILOT ASSEMBLY	A 276 XM19 + A 182 F6NM Nitrided		

ITEM	PART NAME	MATERIAL
17	PACKING FLANGE	AISI 316
23	STUD	AISI 304
24	NUT	AISI 304
252	PACKING FOLLOWER	AISI 316
255	PACKING RING	Flexible Graphite
257	END RING	AISI 316
274	INTERMEDIATE RING	Pure Graphite

<sup>(1)</sup> only for flanged body-bonnet connection

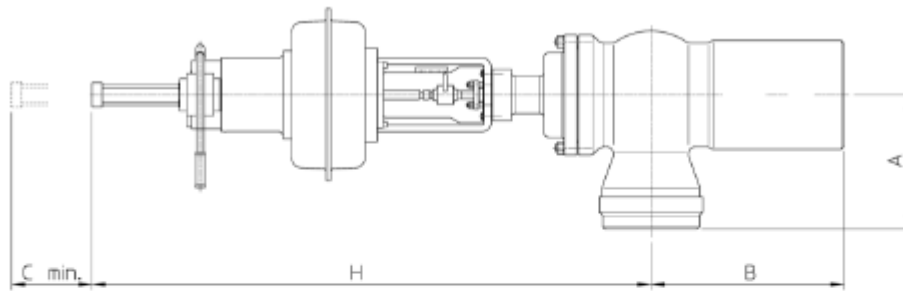
## C<sub>v</sub> TABLES

Port		Valve stroke mm	Max valve C <sub>v</sub> with silencer - gpm					
in.	mm		Linear Characteristic			Modified Linear Characteristic		
			1 stage	2 stages	3 stages	1 stage	2 stages	3 stages
2"	85.5	45	100	100	105	84	85	88
3"	83.5	60	180	170	185	155	145	155
4"	95.5	60	215	200	210	180	170	180
5"	112.5	76	320	280	305	275	245	265
6"	126.5	100	470	380	420	405	345	370
7"	146.5	100	555	455	485	465	400	420
8"	161.5	120	730	570	605	620	515	540
9"	186.5	120	875	695	715	730	615	630
10"	216.5	150	1 250	940	950	1 050	850	855
12"	244.5	150	1 450	1 100	1 100	1 200	995	985
13"	266.5	200	2 050	1 450	1 400	1 750	1 350	1 300
14"	294.5	200	2 350	1 700	1 600	1 950	1 550	1 450
15"	324.5	250	3 150	2 150	2 000	2 700	1 950	1 850
16"	344.5	250	3 350	2 300	2 150	2 900	2 150	2 000
17"	364.5	300	4 150	2 700	2 450	3 600	2 500	2 300



Parcol 1-4475 High Temperature High Pressure control valves.  
 HAS style silencer:  
 - increase downstream silencer efficiency  
 - minimize outlet generated noise levels  
 - allows to reduce valve outlet diameters.

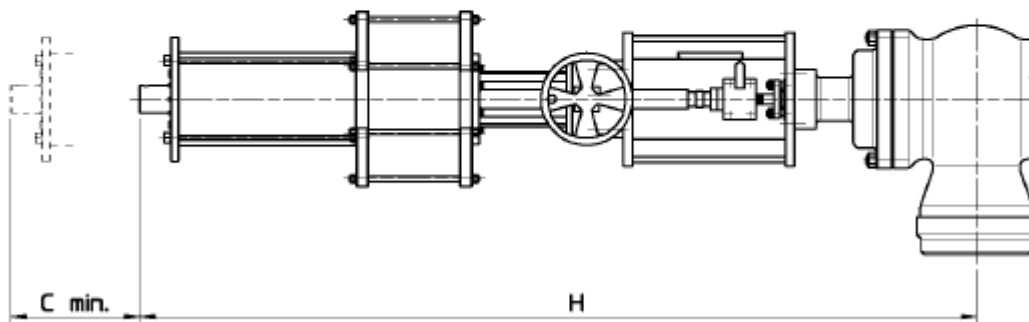
**DIMENSIONS**



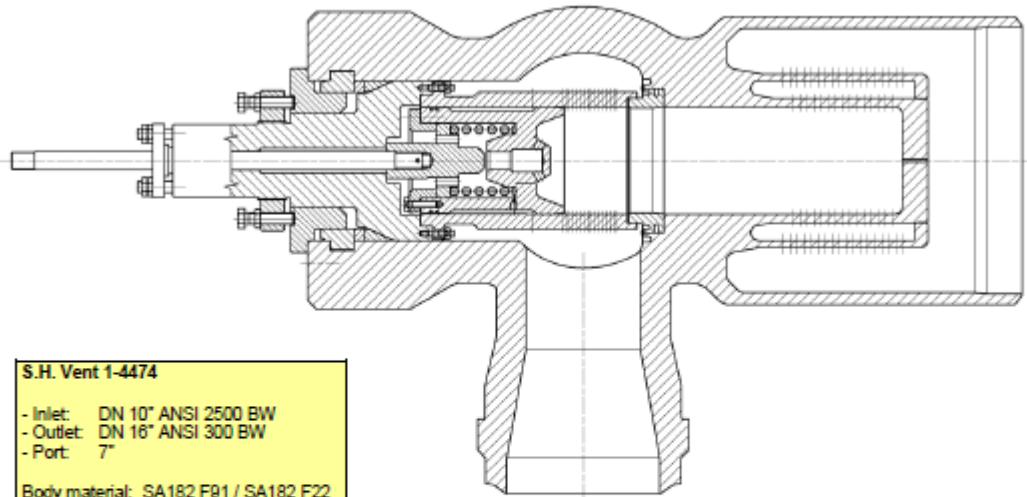
Port in.	Inlet connection in.	ANSI 150-600				ANSI 900-1500				ANSI 2500			
		A	B	C	H	A	B	C	H	A	B	C	H
2"	3"	210	420	250	1070	220	440	250	1080	230	460	250	1110
	4"	220				230				240			
3"	3"	240				260				260	-	-	-
	4"	270	450	250	1080	290	470	250	1090	320			
	6"	270				290				320	490	250	1120
4"	6"	280				300				320			
	8"	300	570	250	1130	380	590	450	1930	390	610	450	1970
	10"	400				480				480			
5"	6"	310				320				360			
	8"	370	620	250	1140	380	640	450	1945	390	655	450	1980
	10"	470				480				480			
6"	6"	320				330				380			
	8"	360	665	450	2055	380	685	450	2055	400	695	450	2085
	10"	460				480				470			
	12"	-	-	-	-	-	-	-	-	550			
7"	8"	350				370				420			
	10"	430	720	450	2060	430	735	450	2075	470	755	450	2100
	12"	520				520				550			
8"	8"	350				400				450			
	10"	410	780	450	2085	430	890	450	2115	450	810	450	2145
	12"	520				500				520			
	14"	-	-	-	-	-	-	-	-	580			
9"	10"	400				450				500			
	12"	470	850	450	2105	480	855	450	2120	520	890	450	2160
	14"	520				540				580			
10"	10"	430				500				550			
	12"	460	940	500	2505	500	940	500	2570	550	1000	500	2615
	14"	500				530				560			
	16"	-	-	-	-	610				650			
12"	12"	480				520				600			
	14"	500	1010	500	2510	530	1015	500	2580	600	1060	500	2630
	16"	560				580				600			
	18"	-	-	-	-	-	-	-	-	700			
13"	14"	500				600				650			
	16"	550	1070	500	2605	600	1090	500	2700	650	1140	500	2770
	18"	610				680				750			
	20"	-	-	-	-	-	-	-	-	850			
14"	14"	520				600				700			
	16"	550				600				700			
	18"	610	1150	500	2615	640	1180	500	2705	800	1240	500	2800
	20"	690				720				900			
15"	18"	600				730				750			
	20"	650	1240	350	3505	750	1340	350	3610	850	1360	350	3700
	22"	700				850				950			
16"	18"	650				730				780			
	20"	700	1300	350	3515	750	1430	350	3650	800	1450	350	3570
	22"	750				850				900			
	24"	800				950				1000			
17"	20"	700				850				850			
	22"	750	1380	400	3535	900	1520	400	3700	900	1540	400	3800
	24"	800				1000				1000			
	26"	850				1100				1100			



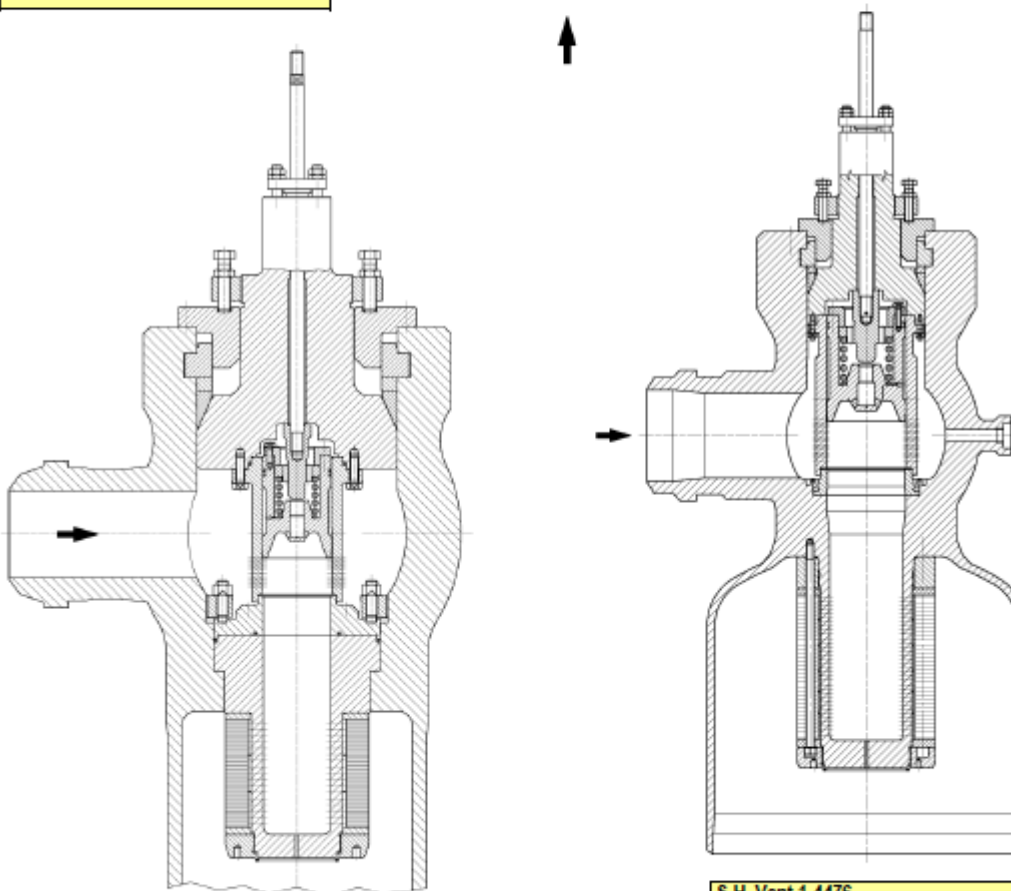
Parcol single effect diaphragm pneumatic actuator 1-X-252 D63 equipped with hydraulic manual operator, with speed regulating additional function.



DOUBLE EFFECT SPRING RETURN PNEUMATIC CYLINDER ACTUATOR (PORT 15" AND OVER)



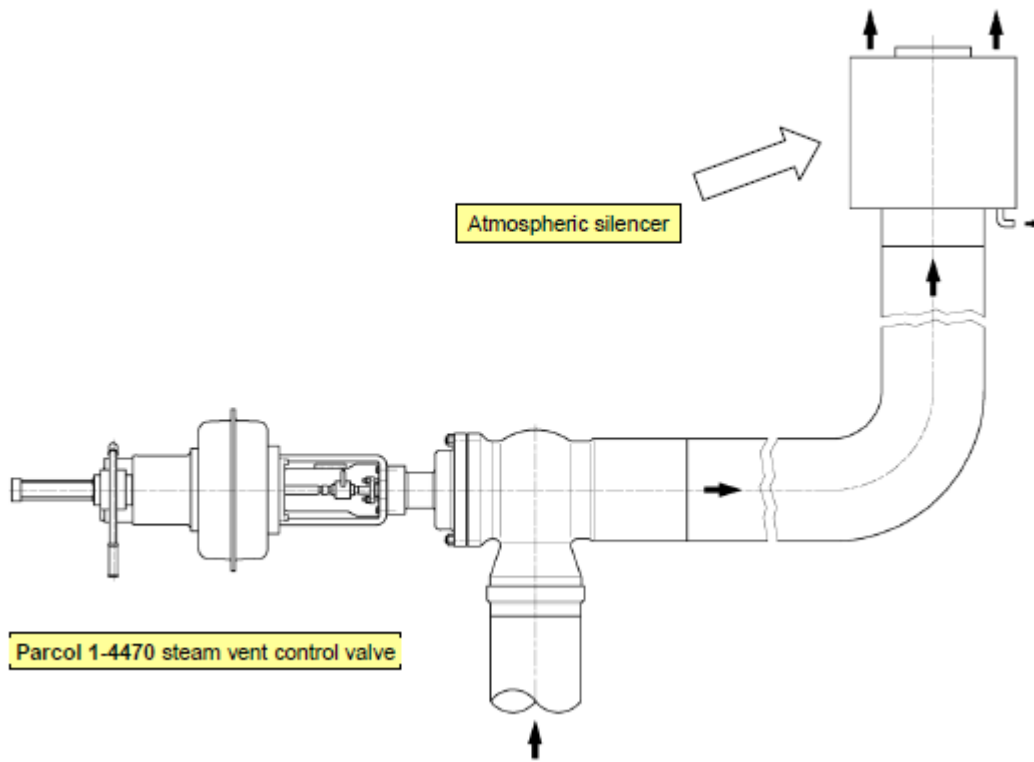
**S.H. Vent 1-4474**  
 - Inlet: DN 10" ANSI 2500 BW  
 - Outlet: DN 16" ANSI 300 BW  
 - Port: 7"  
 Body material: SA182 F91 / SA182 F22



**Parool 1-4476QL High Temperature High Pressure valve with quick change seat and Limphon silencer, suitable for high differential pressure services when very low noise levels are required.**

**S.H. Vent 1-4476**  
 - Inlet: DN 8" ANSI 2500 BW  
 - Outlet: DN 24" ANSI 300 BW  
 - Port: 7"  
 Body material: SA182 F91



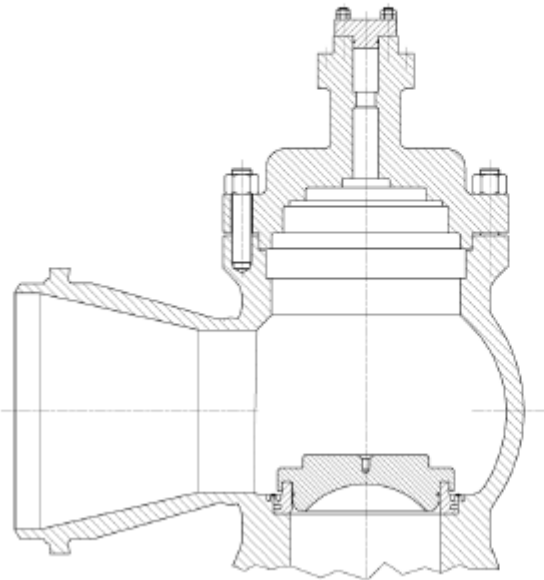


Parcol 3-9811 Limiphon resistor with lateral discharge

## HYDROSTATIC PRESSURE TEST DEVICES

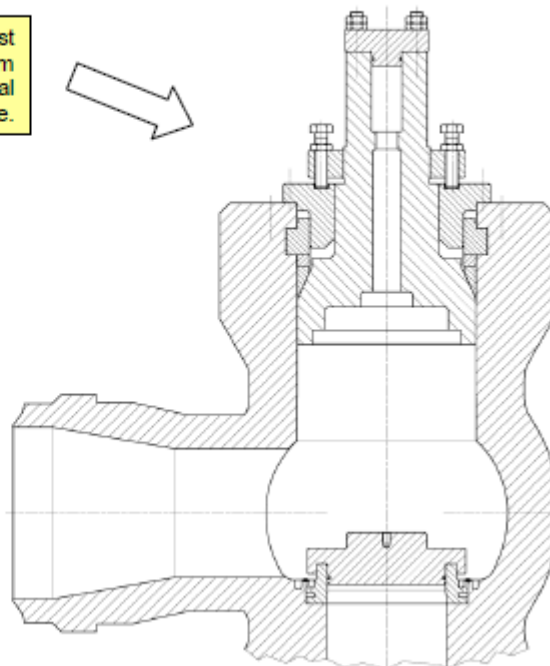
For valves with different upstream-downstream design conditions, upstream section can be hydrostatically tested up to 250 bar without any special device by closing valve plug.

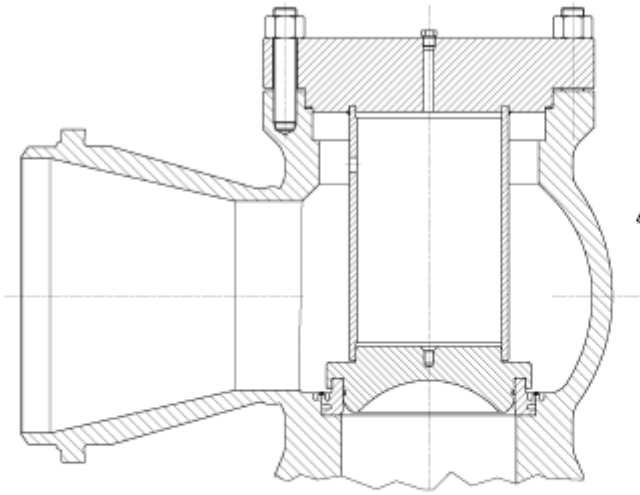
For higher test pressures or when downstream section must be tested separately from upstream section, pressure test devices can be supplied.



Hydrostatic pressure test device for upstream section of flanged body bonnet connection valve.

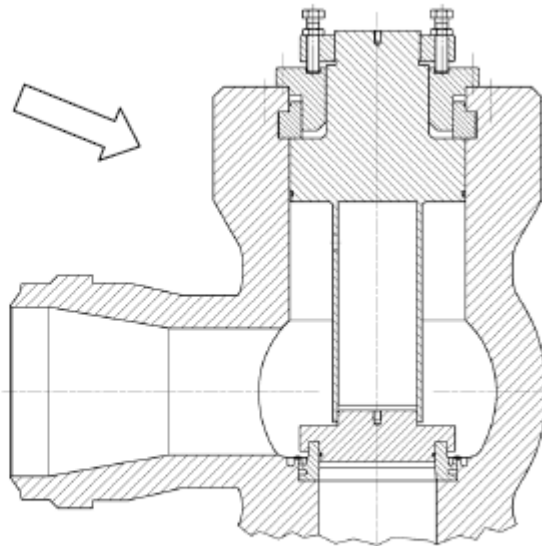
Hydrostatic pressure test device for upstream section of pressure seal bonnet valve.





Hydrostatic pressure test device for upstream and downstream sections of flanged body-bonnet connection valve (optional).

Hydrostatic pressure test device for upstream and downstream sections of pressure seal bonnet connection valve (optional).

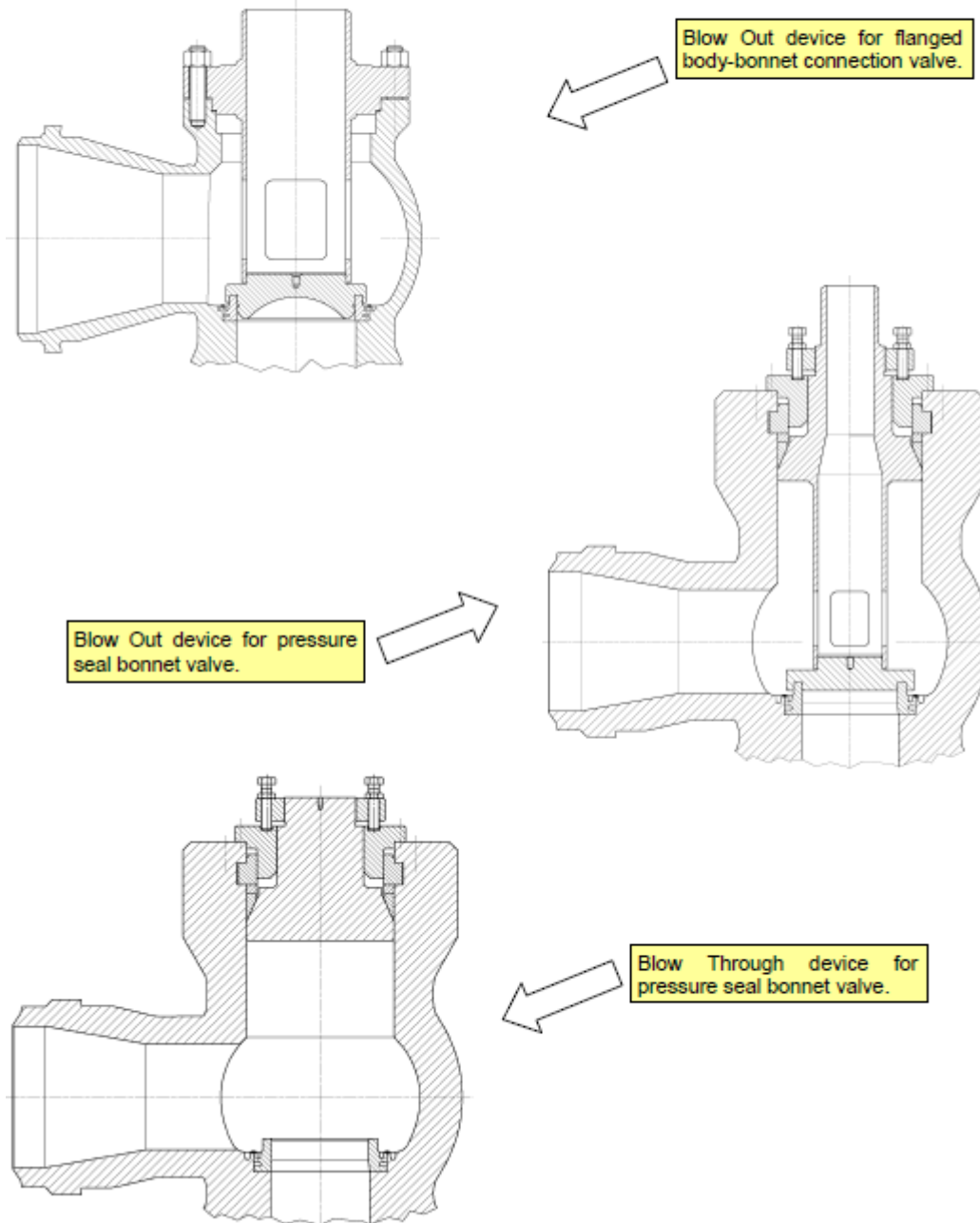


## BLOWING DEVICES

Valve seat of 1-4470 is self-protected by the micro-drilled cage, however line cleaning before valve operation is strongly recommended to avoid trim clogging and internal parts damage.

Blowing devices, typically with "blow out" function, can be supplied on request to perform line cleaning before put valves in service.

Blow through devices are usually supplied only when quick change seat and silencer are provided.



### SPECIAL MAINTENANCE TOOLS

1-4470 are often installed with horizontal actuator axis. For such an installation special tools can be supplied, on request, to simplify disassembly and re-assembly operations.

