

SEMPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

Typical feed water heater isolation system



FEATURES

- Body of forged steel
- Body in form piece to reduce a number of welds and fittings
- Body also available as a single block type – thereby eliminating the nozzle welding seams
- Fast switch over, in order to avoid damaging further HP feedwater pipes
- Alternatives with a moderation of the closing speed by means of various solutions. This is then required if it is possible for the water to hit and damage the separation wall of the preheater or if the customer specifies the operating times
- Simultaneous operation of two main valves with one pilot valve
- Open the preheater only after equalization of the pressure – increases safety because work is done behind the valve
- System medium operated - no heavy actuator
- Alternatives available for selection of the pilot valves

GENERAL APPLICATION

In the event of a defective tube system these valves are designed to stop the feed of high pressure feedwater and to bypass it around a heater or a group of heaters in shortest time. Protection is achieved in the system by installing a quick closing changeover valve in front of and a quick closing check valve behind the heaters in the pipework. The motive power is the feedwater pressure, so that the system is failsafe if either electric or pneumatic supplies fail.

TECHNICAL DATA

Sizes:	DN 80 - DN 500
Temperature:	100 - 360°C
Body material:	1.0460
	1.7335
	1.5415
	1.6368
	A105
	A182F12
Pressure Class:	PN 160 - PN 500

SEPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

OPERATION

In case of damage happening to the preheater pipes, the feedwater supply upstream of the pump and the feed-water backflow from the boiler to the preheater must be shut off in the shortest possible time. Quick shut off and deviation of the flow will both prevent the preheater steam jacket designed for low pressures from being endangered, and also maintain the feed-water supply to the boiler. Moreover, the turbine is protected against water breaking in by flow backs through the bleeder pipe.

Due to the automatic shut off of the preheater and the simultaneous opening of the by-pass line, the feed-water keeps on flowing steadily. Even excessive pipe lengths between the pump and the AV5 valve will not create any additional dynamic forces. Due to the deviation of flow, the water column contained in the by-pass will have to be accelerated. Short by-pass pipes will keep such acceleration forces on a low level.

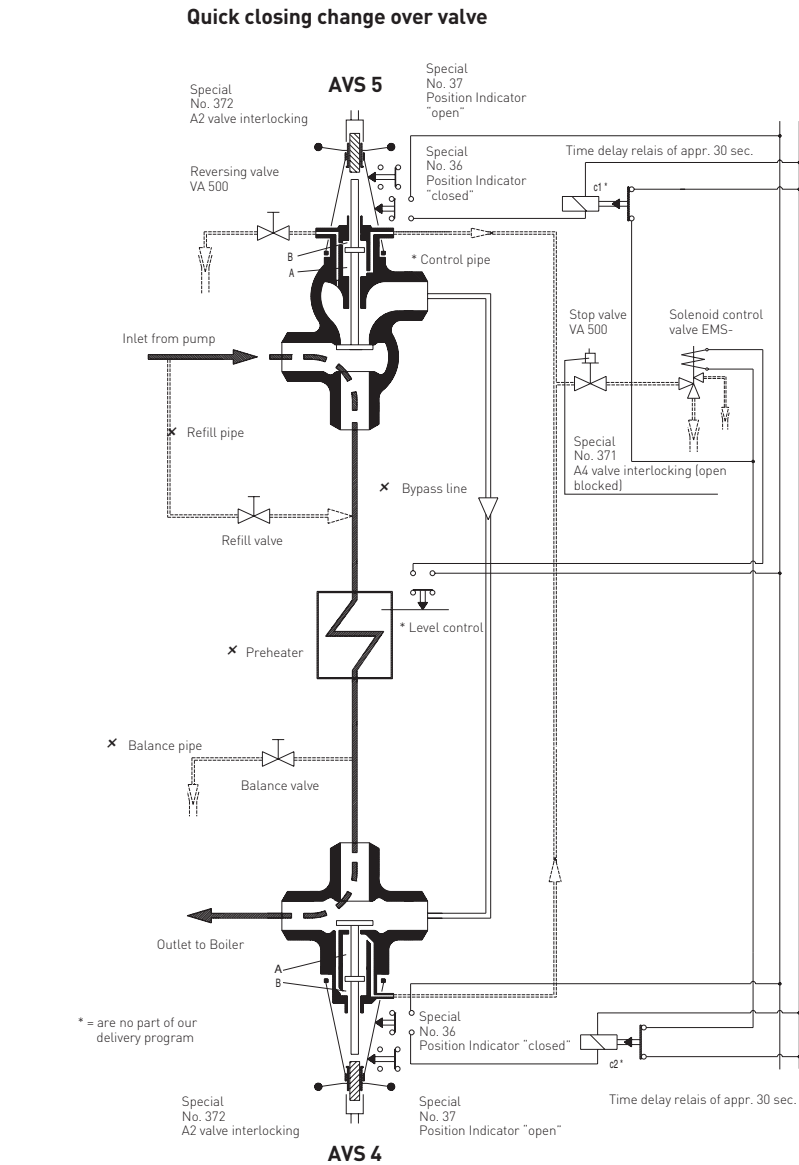
The AV quick closing valves are controlled by their own medium and will respond within a second's time, without varying operating forces and almost free of friction, because the valve seating faces close axially and do not slide on each other, as e.g. with gate valves.

If the feed-water pressure within the preheater pipes rises due to faulty control or during trial runs, the AV valves will act as safety valves and open slightly

In normal operation pump pressure will prevail in the inlet of the AV5 changeover valve. Due to pressure losses, the pressure in the by-pass line is somewhat lower. This pressure differential as well as the balanced stem that is passed to the outside, will safely hold the disc of the AV valve in open position, providing a shut off towards the by-pass. Minor pressure fluctuations within the range of 5% of the inlet pressure will not affect the operation of the AV valves. Higher pressure variations will have to be checked and may require a change in design.

In case of damage in the preheater, the level control emits an electric impulse to the solenoid control valve, in addition to possible optical and audible warnings. The valve opens and relieves the cylinders "A" of the AV valves. Cylinders "B" receive the full pressure of the feed-water line via a small passage, which causes the discs to move into their closing positions. The preheater is no longer in operation and the feed-water flow passes through the by-pass line.

When the solenoid control valve closes, the AV5 changeover valve will only remain in its closed position, if the feed-water pressure in the preheater has lowered by at least 10% as compared with the pump pressure and does not rise again. Therefore, with power test runs,



Quick closing check valve

the AV valves will open automatically, and the preheater is put into operation again, as soon as the solenoid control valve is closed. This automatic opening is effected by the valve stems being balanced and passed through to the outside. The pistons of the AV valves have been so dimensioned, that any opening towards the preheater is prevented, if the latter is pressureless or under low pressure. This design prevents any sudden and harmful admission of pressure to the preheater piping. For the start-up or after repairs the preheater is filled via the refill pipe by the pump line. Only then the AV valves can be opened, or will

open automatically after the pressure has been balanced within the system. With low operating pressures, the open hand-operated control valve relieves the cylinder "B" sufficiently for allowing the disc to move into its open position.

Closing the solenoid control valve after changeover is necessary, because a permanent relief via the control pipe may cause erosion. As shown in the drawing, a corresponding closing impulse is emitted by the electric indicator (SN 36) in "closed" position. Contactors C1 and C2 are lagging at approx. 30 seconds.

SEMPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

DESIGN

Quick - closing valves										
Check valves	AVS 4									
Three way valves	AVS 5									
Size of seat	01	02	03	04	05	06	07	08	09	10
Maximum flow quantity t/h	85	120	200	300	400	550	850	1200	1600	2000
Forged steel	DIN - PN 160 - 500									
Control pipes	DIN - DN 15									

Quick - closing valves

For easy mounting of the AV valves, they should preferably be installed in vertical position. Their pressure losses are equivalent to 90° bands and are substantially more advantageous as compared with T-fittings. In case of preheater groups, the valve bodies being designed as fittings, may serve for the feed-water line to be distributed to the individual preheaters.

Control valves		
For AV valves	Close	EMS3 or EMS4 solenoid control valves Other control valves on request
	Open	Automatically
	Min.(bar)	40 - 160 depending on seat size
		With reversing valve 15

Control valves

The feed-water pressure being used as the source of energy for operating the AV valves necessitates minimum overpressures in the preheater system as shown in the table.

Equipment	
Type ST.KG	Spur gear and bevel gear
Type FA	Remote driving parts
E-actuators	Size and connect. acc. to ISO 5210
Pneumatic actuators	

Equipment

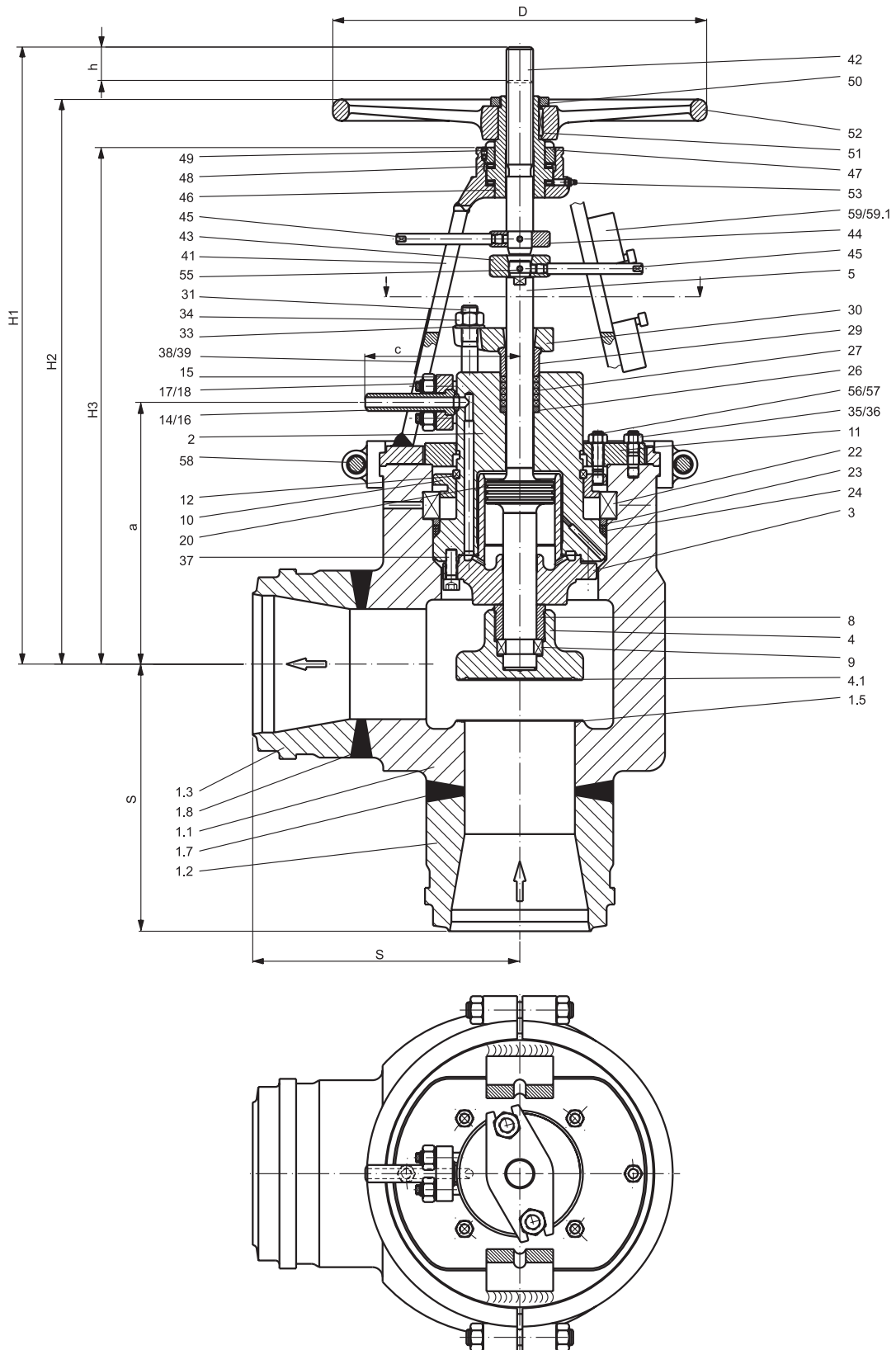
The blocking stem enables the AV valves to be closed independently from the solenoid control. The blocking stems must not be used for closing the disc against the full operating pressure. The AV4 non return valve must not be closed before the AV5 changeover valve has been blocked. The blocking stem can be operated by handwheel or by remote drives with corresponding equipment, see table.

For the maintenance of the solenoid control valve during operation, the stop valve can be closed after the preheater protection has been changed over to bypass operation and the blocking stems have been actuated. This procedure is guaranteed by the valve interlocking SN 372 and SN 371 provided.

SEMPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

Quick closing check valve - Type AVS 4



SEMPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

PARTS LIST AVS 4

Part	Part name	Material code					
		01	51	10	60	11	19
1	Body	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.1	Middle part of the body	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.2	Inlet connecting pipe	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.3	Outlet connecting pipe	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.5	Hardfacing	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel
1.7	Welding seam						
1.8	Welding seam						
2	Cover	1.0460	A105	1.7335	A182F12	1.5415	1.6368
3	Cylinder	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated
4	Disc	1.0460	A105	1.7335	A182F12	1.5415	1.6368
4.1	Hardfacing	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel
5	Rod with piston	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated
8	Disc stem connection	1.7335	1.7335	1.7335	1.7335	1.7335	1.7335
9	Split ring	1.7335	1.7335	1.7335	1.7335	1.7335	1.7335
10	Ring	1.0425	1.0425	1.0425	1.0425	1.0425	1.0425
11	Tightening plate	1.0425	1.0425	1.0425	1.0425	1.0425	1.0425
12	Split ring	1.0460	1.0460	1.0460	1.0460	1.0460	1.0460
14	Convex seal	1.4541	1.4541	1.4541	1.4541	1.4541	1.4541
15	Flange	1.7335	1.7335	1.7335	1.7335	1.7335	1.7335
16	Control stud	1.7335	1.7335	1.7335	1.7335	1.7335	1.7335
17	Bolt	1.7709	1.7709	1.7709	1.7709	1.7709	1.7709
18	Hexagonal nut	1.7258	1.7258	1.7258	1.7258	1.7258	1.7258
20	Piston ring	1.4086	1.4086	1.4086	1.4086	1.4086	1.4086
22	Segment ring	1.7380	A182F22	1.7380	A182F22	1.7380	1.6368
23	Ring	1.0460	A105	1.7335	A182F22	1.5415	1.6368
24	Cover seal	Graphite/1.4541	Graphite/1.4541	Graphite/1.4541	Graphite/1.4541	Graphite/1.4541	Graphite/1.4541
26	Base ring	1.4021	1.4021	1.4021	1.4021	1.4021	1.4021
27	Packing	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
29	Gland shaft	1.4021	1.4021	1.4021	1.4021	1.4021	1.4021
30	Gland flange	1.0460	1.0460	1.7335	1.7335	1.7335	1.7335
31	Stud	1.1181	1.1181	1.1181	1.1181	1.1181	1.1181
33	Washer	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite
34	Hexagonal nut	1.0501	1.0501	1.0501	1.0501	1.0501	1.0501
35	Stud	1.1181	1.1181	1.1181	1.1181	1.1181	1.1181
36	Hexagonal nut	1.0501	1.0501	1.0501	1.0501	1.0501	1.0501
37	Allan bolt	A4	A4	A4	A4	A4	A4
38	Name plate	1.4541	1.4541	1.4541	1.4541	1.4541	1.4541
39	Roundheaded notched nail	Austenite	Austenite	Austenite	Austenite	Austenite	Austenite
41	Bonnet	Divers	Divers	Divers	Divers	Divers	Divers
42	Spindle	1.4021	1.4021	1.4021	1.4021	1.4021	1.4021
43	Indicator ring	1.0460	1.0460	1.0460	1.0460	1.0460	1.0460
44	Indicator ring	1.0460	1.0460	1.0460	1.0460	1.0460	1.0460
45	Guide bolt	1.4122	1.4122	1.4122	1.4122	1.4122	1.4122
46	Threaded bush	CW713R	CW713R	CW713R	CW713R	CW713R	CW713R
47	Ring bearing	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
48	Axial-needle bearing	Ball bearing steel	Ball bearing steel	Ball bearing steel	Ball bearing steel	Ball bearing steel	Ball bearing steel
49	Threaded pin	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite
50	Pipe nut	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite
51	Fitting key	1.0503	1.0503	1.0503	1.0503	1.0503	1.0503
52	Hand wheel	0.6025	0.6025	0.6025	0.6025	0.6025	0.6025
53	Lubrication nipple	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite
55	Tightening pin	Springsteel	Springsteel	Springsteel	Springsteel	Springsteel	Springsteel
56	Stud	1.1181	1.1181	1.1181	1.1181	1.1181	1.1181
57	Hexagonal nut	1.0501	1.0501	1.0501	1.0501	1.0501	1.0501
58	Bonnet holder	Divers	Divers	Divers	Divers	Divers	Divers
59	Limit switch	Divers	Divers	Divers	Divers	Divers	Divers
59.1	Allan bolt	8.8	8.8	8.8	8.8	8.8	8.8

SEPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

WELDING ENDS AVS 4

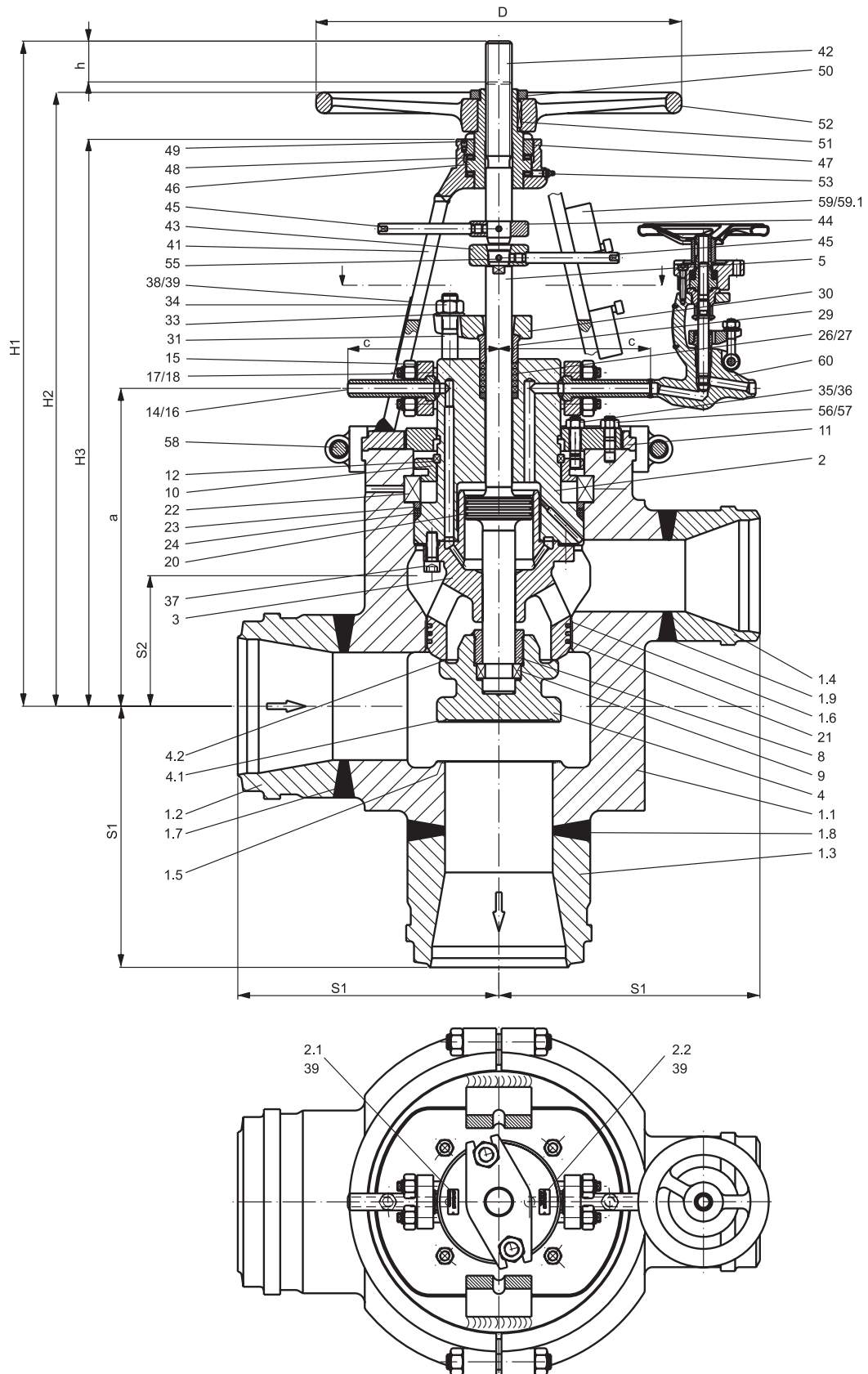
PN	Size of seat	Seat diameter mm	DN Inlet mm	DN Outlet mm	DN Bypass mm	Dimensions in mm								Weight kg
						S	H1	H2	H3	h	D	a	c	
160/500	01	75	80-125	80	50-80	230	665	615	555	35	400	140	235	100
			100-125	100	50-100	250								110
			125	125	50-125	250								120
	02	90	100-150	100	65-100	250	665	615	555	35	400	140	235	140
			125-150	125	65-125	275								155
			150	150	65-150	275								170
160/400	03	115	125-175	125	80-125	300	825	735	675	50	400	330	200	200
			150-175	150	80-150	325								230
			175	175	80-175	325								260
	04	140	150-200	150	100-150	325	825	735	675	50	400	330	200	300
			175-200	175	100-175	350								340
			200	200	100-200	350								390
	05	165	175-250	175	125-175	350	895	825	755	60	560	390	220	420
			200	200	125-200	375								490
			250	200	125-200	375								560
	06	190	200-300	200	125-200	375	895	825	755	60	560	390	220	600
			250	250	125-250	400								700
			300	250	125-250	400								800
	07	240	250-350	250	150-250	425	1120	1020	940	80	560	490	235	900
			300	300	150-300	475								1000
			350	300	150-300	475								1100
	075	260	250-350	250	150-250	425	1120	1020	940	80	560	490	235	900
			300	300	150-300	475								1000
			350	300	150-300	475								1100
	08	290	300-350	300	150-300	525	1140	1030	940	90	560	490	245	1300
			400	300	150-300	550								1400
			350-400	350	150-350	550								1500
	085	310	300-350	300	150-300	525	1140	1030	940	90	560	490	245	1300
			400	300	150-300	550								1400
			350-400	350	150-350	550								1500
	09	335	350-400	350	200-350	575	1295	1160	1080	105	800	530	270	2000
			450	350	200-300	625								2200
			400-450	400	200-400	625								2400
	095	360	350-400	350	200-350	575	1295	1160	1080	105	800	530	270	2000
			450	350	200-300	625								2200
			400-450	400	200-400	625								2400
	10	375	400-450	400	250-400	625	1300	1160	1180	115	800	565	285	3000
			500	400	250-400	625								3400
			450-500	450	250-450	625								3800
	105	390	400-450	400	250-400	625	1300	1160	1180	115	800	565	285	3000
			500	400	250-400	625								3400
			450-500	450	250-450	625								3800

Welding ends as specified by customer

SEMPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

Quick closing three-way valve - Type AVS 5



SEPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

PARTS LIST AVS 5

Part	Part name	Material code					
		01	51	10	60	11	19
1	Body	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.1	Middle part of the body	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.2	Inlet connecting pipe	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.3	Outlet connecting pipe	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.4	Bypass connecting pipe	1.0460	A105	1.7335	A182F12	1.5415	1.6368
1.5	Hardfacing	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel
1.6	Hardfacing	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel
1.7	Welding seam						
1.8	Welding seam						
1.9	Welding seam						
2	Cover	1.0460	A105	1.7335	A182F12	1.5415	1.6368
2.1	Indication plate	1.4541	1.4541	1.4541	1.4541	1.4541	1.4541
2.2	Indication plate	1.4541	1.4541	1.4541	1.4541	1.4541	1.4541
3	Cylinder	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated	1.4008 / part. Cr-plated
4	Disc	1.0460	A105	1.7335	A182F12	1.5415	1.6368
4.1	Hardfacing	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel
4.2	Hardfacing	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel	Chromium steel
5	Rod with piston	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated	1.4021 / par. Cr-plated
8	Disc stem connection	1.7335	1.7335	1.7335	1.7335	1.7335	1.7335
9	Split ring	1.7335	1.7335	1.7335	1.7335	1.7335	1.7335
10	Ring	1.0425	1.0425	1.0425	1.0425	1.0425	1.0425
11	Tightening plate	1.0425	1.0425	1.0425	1.0425	1.0425	1.0425
12	Split ring	1.0460	1.0460	1.0460	1.0460	1.0460	1.0460
14	Convex seal	1.4541	1.4541	1.4541	1.4541	1.4541	1.4541
15	Flange	1.7335	1.7335	1.7335	1.7335	1.7335	1.7335
16	Control stud	1.7335	1.7335	1.7335	1.7335	1.7335	1.7335
17	Bolt	1.7709	1.7709	1.7709	1.7709	1.7709	1.7709
18	Hexagonal nut	1.7258	1.7258	1.7258	1.7258	1.7258	1.7258
20	Piston ring	1.4086	1.4086	1.4086	1.4086	1.4086	1.4086
21	Piston ring	1.4086	1.4086	1.4086	1.4086	1.4086	1.4086
22	Segment ring	1.7380	A182F22	1.7380	A182F22	1.7380	1.6368
23	Ring	1.0460	A 105	1.7335	A182F12	1.5415	1.6368
24	Cover seal	Graphite/1.4541	Graphite/1.4541	Graphite/1.4541	Graphite/1.4541	Graphite/1.4541	Graphite/1.4541
26	Base ring	1.4021	1.4021	1.4021	1.4021	1.4021	1.4021
27	Packing	Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
29	Gland shaft	1.4021	1.4021	1.4021	1.4021	1.4021	1.4021
30	Gland flange	1.0460	1.0460	1.7335	1.7335	1.7335	1.7335
31	Stud	1.1181	1.1181	1.1181	1.1181	1.1181	1.1181
33	Washer	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite
34	Hexagonal nut	1.0501	1.0501	1.0501	1.0501	1.0501	1.0501
35	Stud	1.1181	1.1181	1.1181	1.1181	1.1181	1.1181
36	Hexagonal nut	1.0501	1.0501	1.0501	1.0501	1.0501	1.0501
37	Allan bolt	A4	A4	A4	A4	A4	A4
38	Name plate	1.4541	1.4541	1.4541	1.4541	1.4541	1.4541
39	Roundheaded notched nail	Austenite	Austenite	Austenite	Austenite	Austenite	Austenite
41	Bonnet	Divers	Divers	Divers	Divers	Divers	Divers
42	Spindle	1.4021	1.4021	1.4021	1.4021	1.4021	1.4021
43	Indicator ring	1.0460	1.0460	1.0460	1.0460	1.0460	1.0460
44	Indicator ring	1.0460	1.0460	1.0460	1.0460	1.0460	1.0460
45	Guide bolt	1.4122	1.4122	1.4122	1.4122	1.4122	1.4122
46	Threaded bush	CW713R	CW713R	CW713R	CW713R	CW713R	CW713R
47	Ring bearing	1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
48	Axial-needle bearing	Ball bearing steel	Ball bearing steel	Ball bearing steel	Ball bearing steel	Ball bearing steel	Ball bearing steel
49	Threaded pin	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite

SEPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

PARTS LIST AVS 5 (CONTINUED)

Part	Part name	Material code					
		01	51	10	60	11	19
50	Pipe nut	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite
51	Fitting key	1.0503	1.0503	1.0503	1.0503	1.0503	1.0503
52	Hand wheel	0.6025	0.6025	0.6025	0.6025	0.6025	0.6025
53	Lubrication nipple	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite	Ferrite
55	Tightening pin	Springsteel	Springsteel	Springsteel	Springsteel	Springsteel	Springsteel
56	Stud	1.1181	1.1181	1.1181	1.1181	1.1181	1.1181
57	Hexagonal nut	1.0501	1.0501	1.0501	1.0501	1.0501	1.0501
58	Bonnet holder	Divers	Divers	Divers	Divers	Divers	Divers
59	Limit switch	Divers	Divers	Divers	Divers	Divers	Divers
59.1	Allan bolt	8.8	8.8	8.8	8.8	8.8	8.8
60	Manual control valve	Divers	Divers	Divers	Divers	Divers	Divers

WELDING ENDS AVS 5

PN	Size of seat	Seat diameter mm	DN Inlet mm	DN Outlet mm	DN Bypass mm	Dimensions in mm									Weight kg	
						S1	S2	H1	H2	H3	h	D	a	c		
160/500	01	75	80-125	80	50-80	230	140	665	615	555	35	400	80	235	130	
			100-125	100	50-100	250									140	
			125	125	50-125	250										150
	02	90	100-150	100	65-100	250	140	665	615	555	35	400	80	235	180	
			125-150	125	65-125	275										195
			150	150	65-150	275										210
160/400	03	115	125-175	125	80-125	300	160	885	795	735	50	400	385	200	260	
			150-175	150	80-150	325										290
			175	175	80-175	325										320
	04	140	150-200	150	100-150	325	160	885	795	725	50	400	385	200	390	
			175-200	175	100-175	350										430
			200	200	100-200	350										480
	05	165	175-250	175	125-175	350	200	990	920	850	60	560	470	220	520	
			200	200	125-200	375										590
			250	200	125-200	375										660
	06	190	200-300	200	125-200	375	210	1000	930	860	60	560	470	220	730	
			250	250	125-250	400										830
			300	250	125-250	400										930
	07	240	250-350	250	150-250	425	280	1285	1185	1110	80	560	595	245	1100	
			300	300	150-300	475										1200
			350	300	150-300	475										1300
	075	260	250-350	250	150-250	425	280	1285	1185	1110	80	560	595	245	1100	
			300	300	150-300	475										1200
			350	300	150-300	475										1300
	08	290	300-350	300	150-300	525	320	1325	1225	1150	90	560	690	245	1600	
			400	300	150-300	550										1700
			350-400	350	150-350	550										1800
	085	310	300-350	300	150-300	525	320	1325	1225	1150	90	560	690	245	1600	
			400	300	150-300	550										1700
			350-400	350	150-350	550										1800
	09	335	350-400	350	200-350	575	365	1565	1425	1345	105	800	785	270	2600	
			450	350	200-300	625										2800
			400-450	400	200-400	625										3000
	095	360	350-400	350	200-350	575	365	1565	1425	1345	105	800	785	270	2600	
			450	350	200-300	625										2800
			400-450	400	200-400	625										3000
	10	375	400-450	400	250-400	625	400	1650	1510	1430	115	800	875	285	3700	
			500	400	250-400	650										4100
			450-500	450	250-450	650										4500
	105	390	400-450	400	250-400	625	400	1650	1510	1430	115	800	875	285	3700	
			500	400	250-400	650										4100
			450-500	450	250-450	650										4500

Welding ends as specified by customer

SEPELL HP PREHEATER PROTECTION VALVES

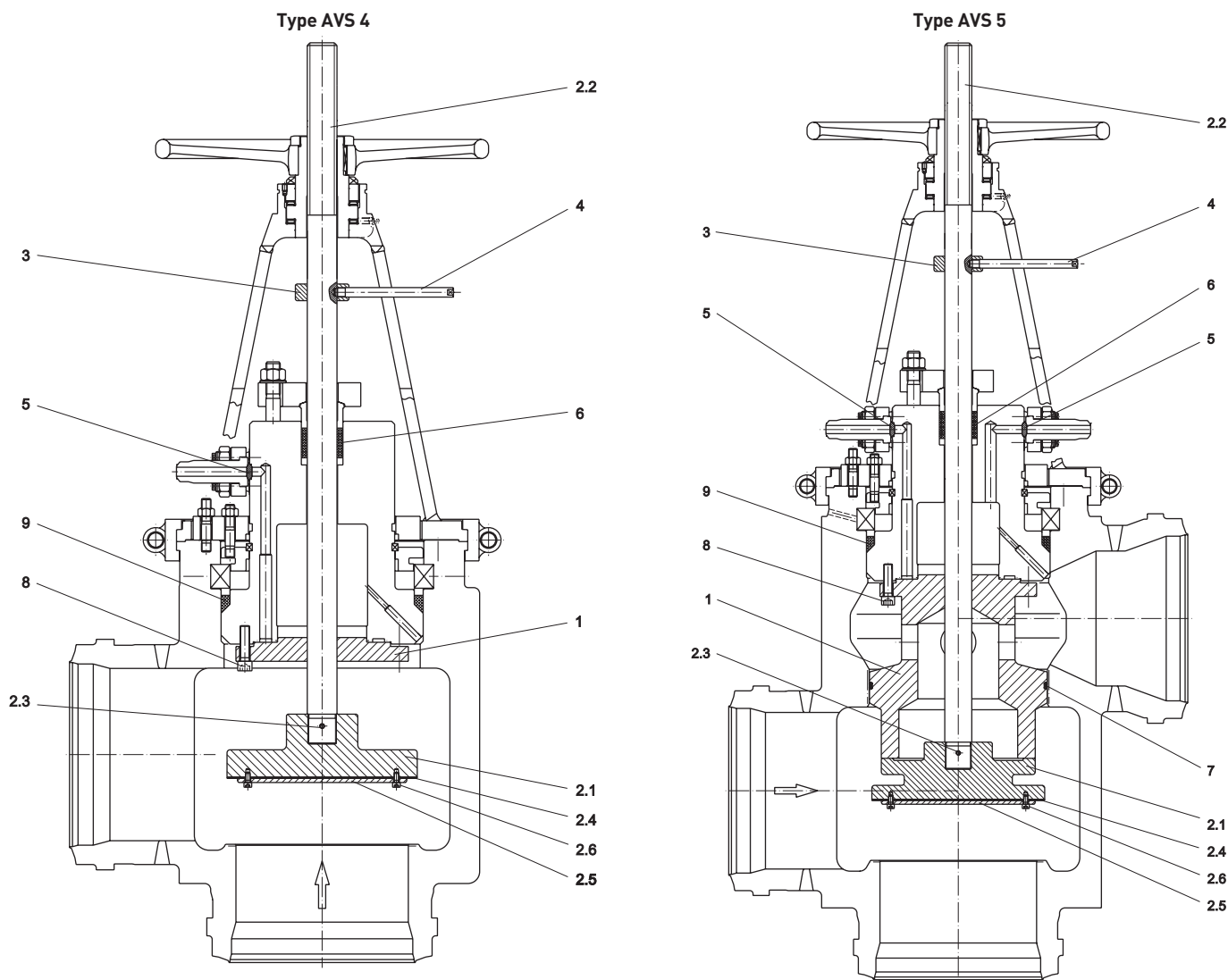
TYPE AVS 4/5

LOCATIONS OF CONNECTIONS FOR SEAT SIZE 03-10 FOR AVS 4/5

The maximum number of connections of the outlet plane is 4 of limited size. There must be at least 90° between adjacent connections. Their number, sizes and angular positions must be stated upon ordering or inquiring.

The angular positions of the control connection (16) is independent of the connections of the valve body. It can be fixed in any desired position after loosening the hexagonal nuts (36, 57, 58.2). Where an extra manual control valve SN 66 is employed, it should be fitted exactly opposite (180°) to the control connection (16).

EXHAUST-, RINSING- AND PICKLING INSERT



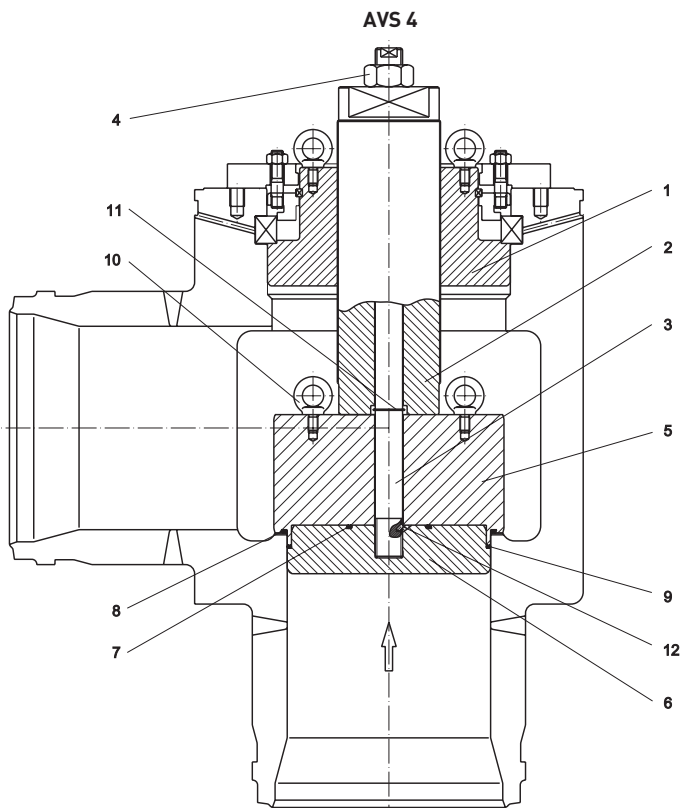
Parts list AVS 4				Parts list AVS 5			
1	Pickling cylinder	3	Guide ring	1	Pickling cylinder	3	Guide ring
2.1	Pickling disc	4	Guide bolt	2.1	Pickling disc	4	Guide bolt
2.2	Pickling stem	5	Dummy convex seal	2.2	Pickling stem	5	Dummy convex seal
2.3	Tightening pin	6	Packing	2.3	Tightening pin	6	Packing
2.4	Sealing plate	8	Allan bolt	2.4	Sealing plate	7	O-Ring
2.5	Holding plate	9	Gasket	2.5	Holding plate	8	Allan bolt
2.6	Allan bolt			2.6	Allan bolt	9	Gasket

To avoid damages of the hard-faced sliding surfaces, seats and control valves, it is necessary to disassemble the valve components above mentioned and replaced by accessory parts before exhausting, rinsing and pickling is carried out.

SEMPELL HP PREHEATER PROTECTION VALVES

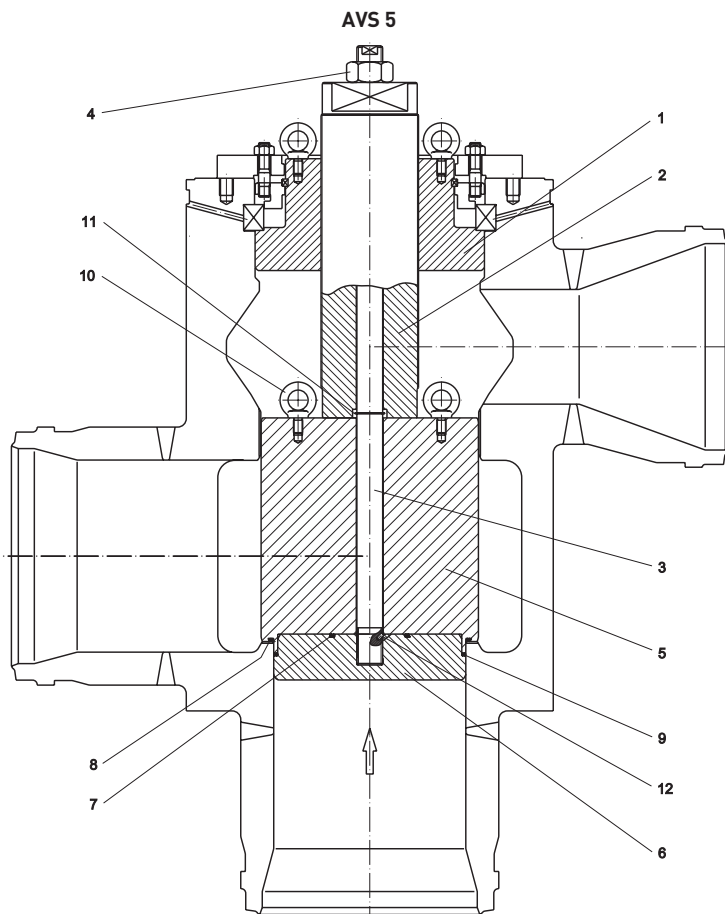
TYPE AVS 4/5

INSERT FOR PRESSURE TEST



Parts list AVS 4

1	Lid
2	Tightening screw
3	Threaded stem
4	Hexagonal nut
5	Tightening plate
6	Shutt off plate
7	O-Ring
8	O-Ring
9	O-Ring
10	Ring screw
11	Safety ring
12	Cylinder slotted pin



Parts list AVS 5

1	Lid
2	Tightening screw
3	Threaded stem
4	Hexagonal nut
5	Tightening plate
6	Shutt off plate
7	O-Ring
8	O-Ring
9	O-Ring
10	Ring screw
11	Safety ring
12	Cylinder slotted pin

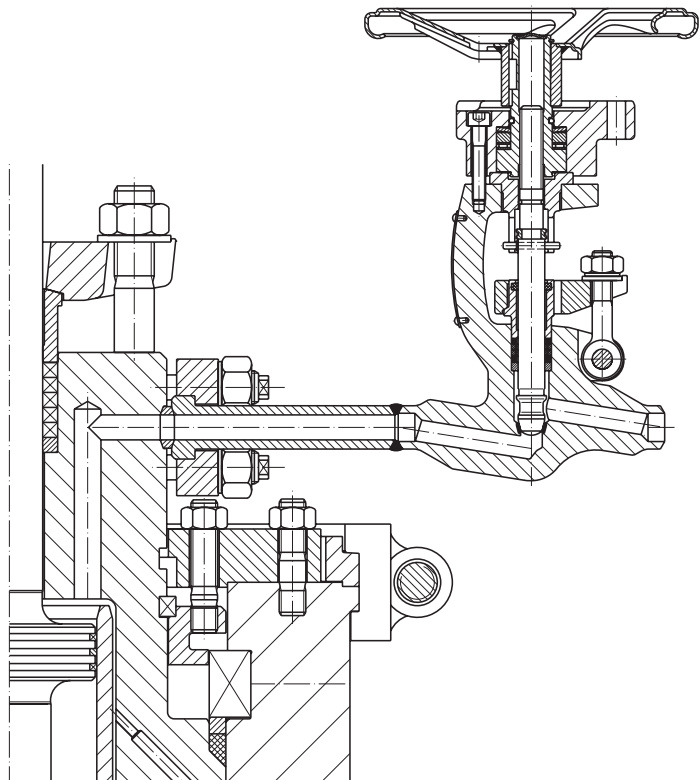
The driving heads with blocking stems [42] must not be used for shutting off against the full operating- of test pressure. For pressure within the installation special pressure test inserts will have to be employed.

SEPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

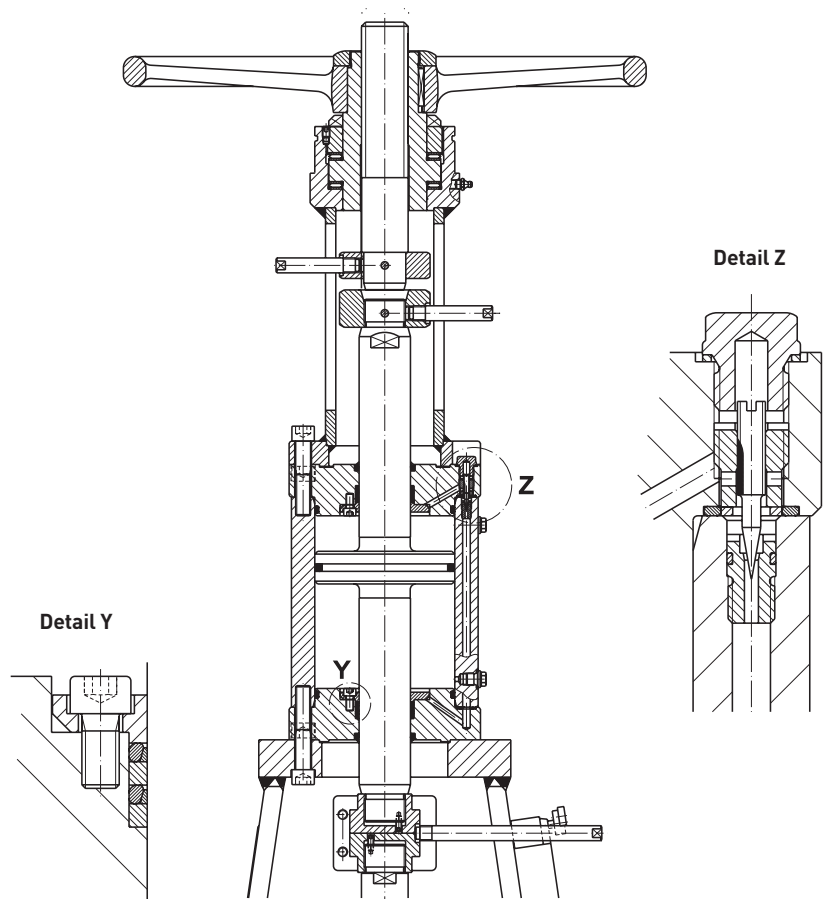
Standard accessories AVS 4

Manual control valve (SN 66).



Standard accessories

Hydraulic brake to increase opening and closing times by several seconds (SN 74).



SEPELL HP PREHEATER PROTECTION VALVES

TYPE AVS 4/5

SELECTION GUIDE FOR CODING SYSTEM

Example	AVS 4	02	160	300	300	200	10	(000)
Valve type								
AVS 4 Outlet valve								
AVS 5 Inlet valve								
Seat size								
01 = 75 mm		075 = 260 mm						
02 = 90 mm		08 = 290 mm						
03 = 115 mm		085 = 310 mm						
04 = 140 mm		09 = 335 mm						
05 = 165 mm		095 = 360 mm						
06 = 190 mm		10 = 375 mm						
07 = 240 mm		105 = 390 mm						
Nominal pressure								
PN 160 - 500								
Inlet nominal size								
DN 80		DN 250						
DN 100		DN 300						
DN 125		DN 350						
DN 150		DN 400						
DN 175		DN 450						
DN 200		DN 500						
Outlet nominal size								
DN 80		DN 250						
DN 100		DN 300						
DN 125		DN 350						
DN 150		DN 400						
DN 175		DN 450						
DN 200		DN 500						
Size of bypass								
DN 80		DN 250						
DN 100		DN 300						
DN 125		DN 350						
DN 150		DN 400						
DN 175		DN 450						
DN 200		DN 500						
Material code								
01 = 1.0460								
10 = 1.7335								
11 = 1.5415								
19 = 1.6368								
51 = A105								
60 = A182F12								
Accessories								