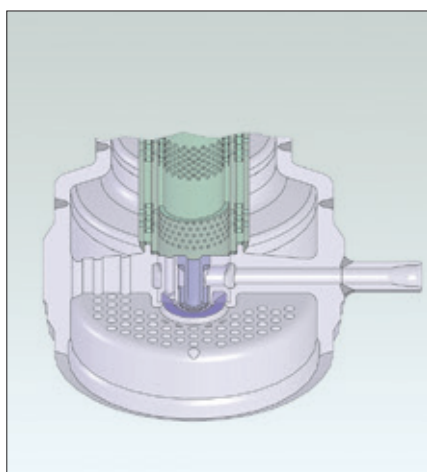
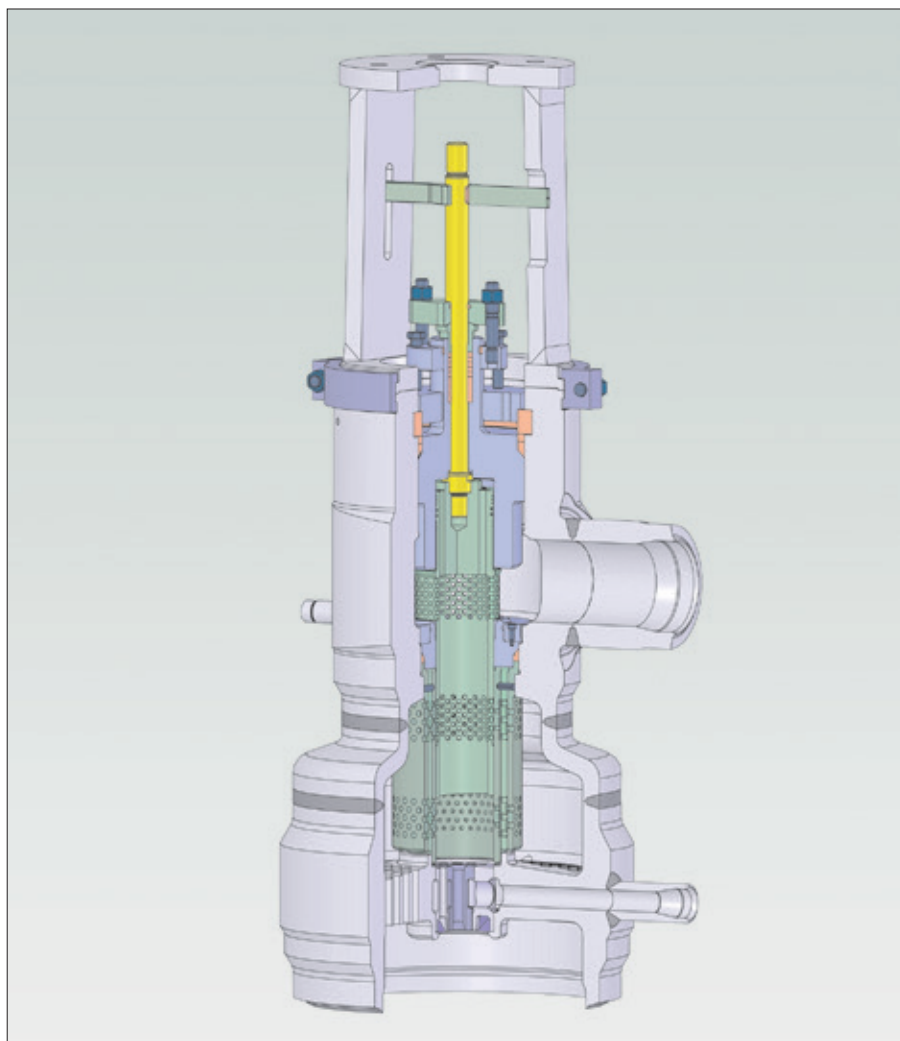


SEMPELL

Steam Turbine and Boiler protection at Steam Turbine trip. Steam Turbine bypass to Cold Reheat or Condenser while Boiler/Turbine start-up and shut-down.

Features and Benefits

- Pressure reduction by multi-stage controlled, subcritical expansion peculiar low noise
- Trim can be changed in the system
 - valve seat can be changed
 - cage can be changed"
- Subsequently adjustment to changed operational conditions is possible
- Good adjustment to the task by optimum-staged Cv-value-series and large turn-down ratio
- Steam bypass over downstream two-fluid nozzle at outlet
 - integrated in restrictor
 - replaceable via flanges without bonnet disassembly
- Pressure seal bonnet
- Low maintenance gland (packing pure graphite) can be retightened
- Burnished valve stem
- Surfaces treated guiding faces on each moving part
- Optional
 - pressure balanced plug
 - hardfaced sealing faces
 - pre-warming and drain studs"
- Easy storage of spare parts by modular design
- Universal connections by various design of welding ends as standard
- Deviating designs of welding ends in regard of dimension and material as well as designs with accessories according customers request
- Pickling resistant of trim
- All usual actuator types can be used



Technical Data

Size	: 80 - 400 further design on request
Pressure class	: PN 320
Body material	: 11 CrMo 9-10 (1.7383 / A182F22) other design on request
Trim Materials	: Stem 1.4922 Cages 1.7380 / A335P22 Seat ring 1.7380 - hardfaced Stellite 6
Stem sealing	: Pure graphite
Trim design	: Perforated disc, 1. stage Cages, 2 - 5. stage"
Guide	: Stem guide, guidance at seat ring
Turn-down ratio	: Standard 1:25
Sealing seat/plug	: Metallic, class IV
Shutoff leakage class	: (DIN EN1349), other design on request

HP Steam bypass valves

The steam bypass valves of series 115 are used to transform steam, i.e. to reduce pressure and temperature of steam. The processes of pressure reduction and desuperheating are separated in the valve and take place one after the other. The desuperheating takes place at the outlet of the valve by means of atomizing steam spray through special nozzles.

An optimum-staged CV-value-series and a large turn-down ratio allow an exact adjustment to the pertaining task. The trim can be easily changed. An adjustment to subsequently changed operational conditions is thus possible.

A combination of material choice and multi-stage pressure reduction in radial cage system make the valve highly resistant to wear in spite of extreme working conditions.

Type 115 with integral steam desuperheating orifice

Balanced trim

Prepared for mounting a pneumatic actuator

Flow tends to close

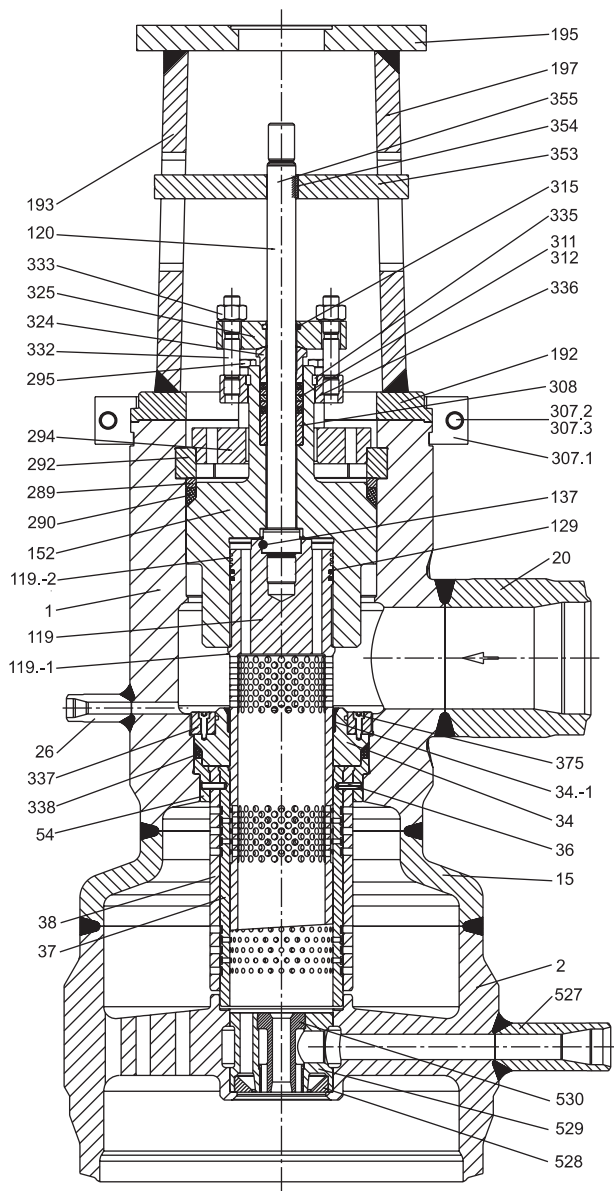


Figure 1

Type 115 with nozzle complete

Non-balanced trim

Prepared for mounting a pneumatic actuator

Flow tends to close

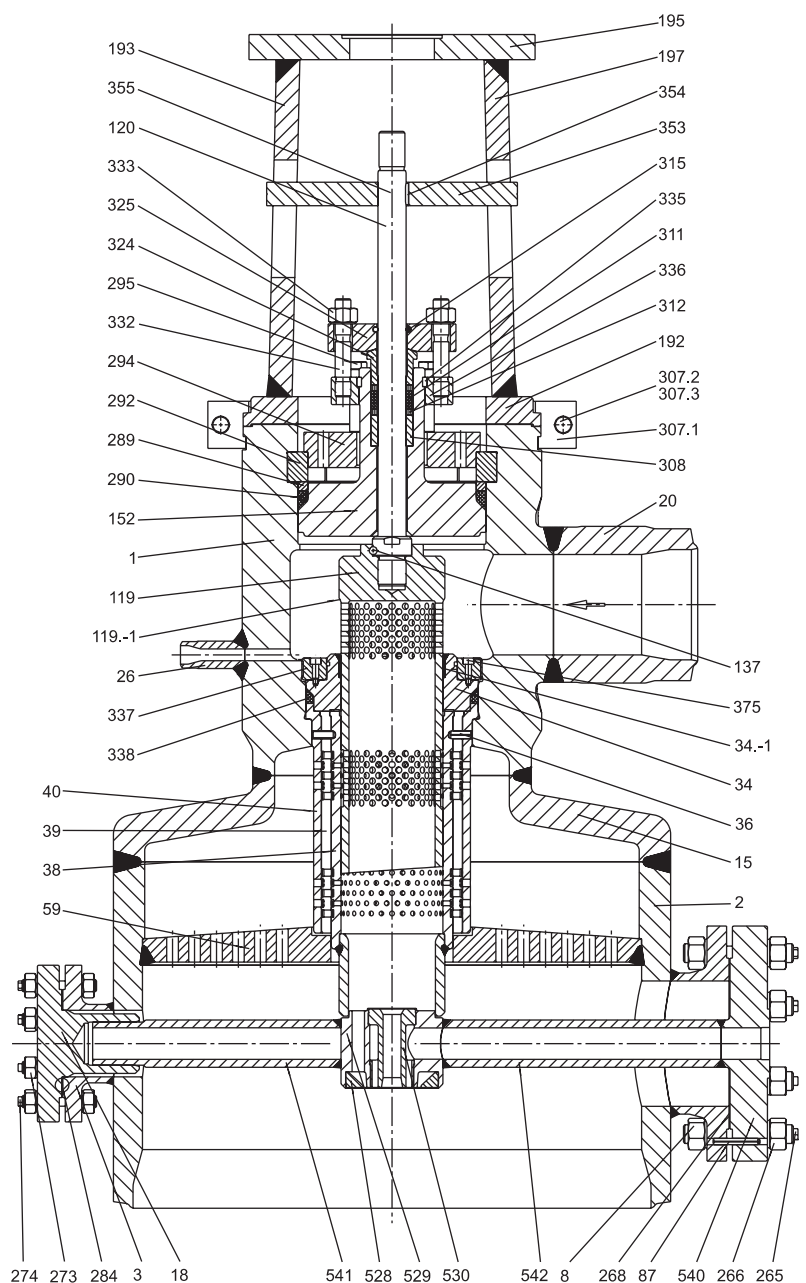


Figure 2

Pressure balancing systems

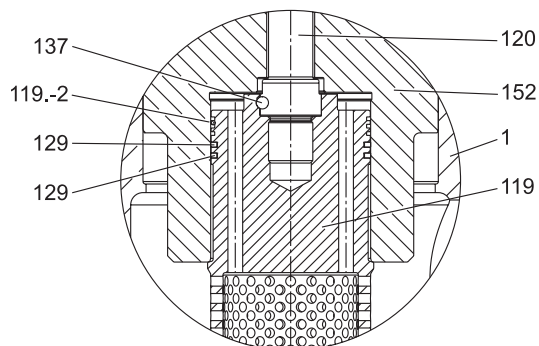


Figure 3
Detail pressure balance without pilot disc

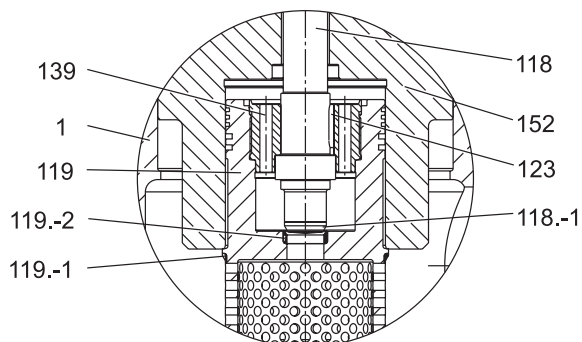


Figure 4
Detail pressure balance with pilot disc

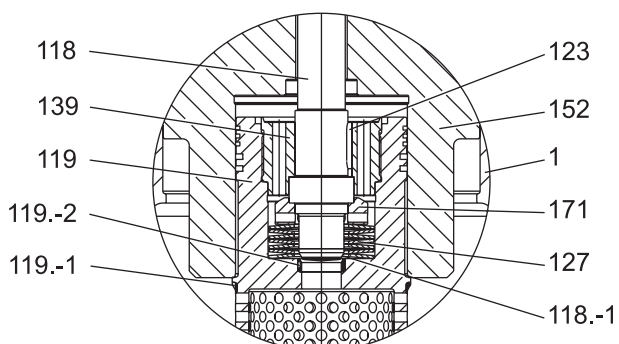


Figure 5
Detail pressure balance with pilot disc and cup spring set

Trims

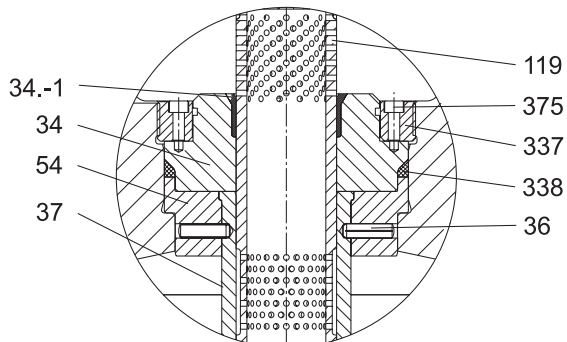


Figure 6
Two-stage controlled perforated disc trim

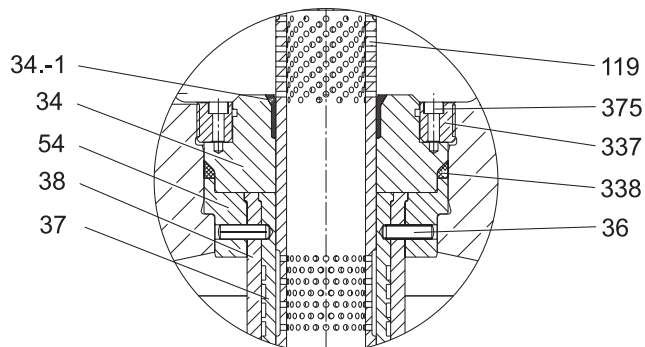


Figure 7
Three-stage controlled perforated disc trim

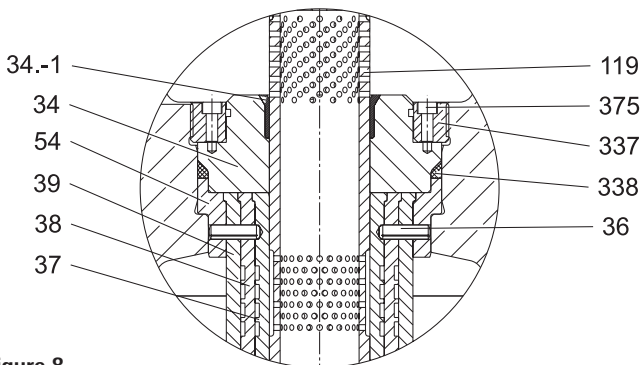


Figure 8
Four-stage controlled perforated disc trim

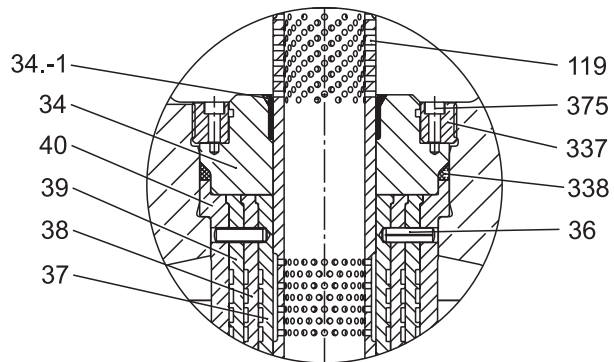


Figure 9
Five-stage controlled perforated disc trim

High Pressure Steam Bypass Valves - Type 115 DIN

Table 1 - Materials, material specification

Pos.	Name	DIN-Material				
		01	10	11	13	30
1	body	1.0460	1.7335	1.5415	1.7383	1.4903
2	pipe connection	1.0460	1.7335	1.5415	1.7335	1.7380
15	distance piece	1.0460	1.7335	1.5415	1.7335	1.7380
20	pipe connection	1.0460	1.7335	1.5415	1.7383	1.4903
26	nozzle	1.0460	1.7335	1.5415	1.7383	1.4903
Design L-type (without pressure balance)						
* 34	seat ring	1.7380	1.7380	1.7380	1.7380	1.4903
34.-1	seat hard faced	Stellit 6	Stellit 6	Stellit 6	Stellit 6	Stellit 6
36	grooved pin	Austenit	Austenit	Austenit	Austenit	Austenit
* 37	cage	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22
* 38	cage	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22
* 39	cage	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22
* 40	cage	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22	1.7380 / SA335P22
54	change holder	1.7380	1.7380	1.7380	1.7380	1.4903
* 119	plug	1.7380 nitr.	1.7380 nitr.	1.7380 nitr.	1.7380 nitr.	1.4903
119.-1	plug hard faced	Stellit 6	Stellit 6	Stellit 6	Stellit 6	Stellit 6
* 120	stem	1.4922	1.4922	1.4922	1.4922	1.4922
152	closure	1.7380	1.7380	1.7380	1.7380	1.4903
192	yoke flange	1.5415	1.5415	1.5415	1.7335	1.7380
193	yoke arm	1.5415	1.5415	1.5415	1.7335	1.7380
195	yoke head	1.5415	1.5415	1.5415	1.7335	1.7380
197	yoke arm	1.5415	1.5415	1.5415	1.7335	1.7380
289	distance piece	1.7380	1.7380	1.7380	1.7380	1.4903
* 290	gasket	Grafit / Austenit	Grafit / Austenit	Grafit / Austenit	Grafit / Austenit	Grafit / Austenit
292	segmented ring	1.7380	1.7380	1.7380	1.7380	1.4903
294	cover	1.7380	1.7380	1.7380	1.7380	1.7380
295	hexagon screw	1.7709	1.7709	1.7709	1.7709	1.7709
307.1	locking ring	1.7335 (1.7380)	1.7335 (1.7380)	1.7335 (1.7380)	1.7335 (1.7380)	1.7335 (1.7380)
307.2	stud	1.7709	1.7709	1.7709	1.7709	1.7709
307.3	hexagon nut	1.7258	1.7258	1.7258	1.7258	1.7258
* 308	guide bush	1.8550 nitr.	1.8550 nitr.	1.8550 nitr.	1.8550 nitr.	1.4903/Stel.
* 311	packing ring	Grafit	Grafit	Grafit	Grafit	Grafit
* 312	packing ring	Grafit / Austenit	Grafit / Austenit	Grafit / Austenit	Grafit / Austenit	Grafit / Austenit
* 315	packing cord	Grafit	Grafit	Grafit	Grafit	Grafit
324	gland	1.8550 nitr.	1.8550 nitr.	1.8550 nitr.	1.8550 nitr.	1.8550 nitr.
325	gland flange	1.7335	1.7335	1.7335	1.7335	1.7335
332	stud	1.7709	1.7709	1.7709	1.7709	1.7709
333	hexagonal nut	1.7258	1.7258	1.7258	1.7258	1.7258
335	divided ring	1.7335	1.7335	1.7335	1.7335	1.7335 / 1.7380
336	fixing ring	1.7335	1.7335	1.7335	1.7335	1.7335
337	locking screw	1.7380 nitr.	1.7380 nitr.	1.7380 nitr.	1.7380 nitr.	1.4903 nitr.
* 338	gasket	Grafit	Grafit	Grafit	Grafit	Grafit
353	clamp	1.1191	1.1191	1.1191	1.1191	1.1191
354	parallel key	1.0503	1.0503	1.0503	1.0503	1.0503
355	hexagon screw	8,8	8,8	8,8	8,8	8,8
375	socket head screw	Austenit	Austenit	Austenit	Austenit	1.4986
Design M-type (with pressure relief)						
118	stem plug	1.4922	1.4922	1.4922	1.4922	1.4903
118.-1	plug hard faced	Stellit 6	Stellit 6	Stellit 6	Stellit 6	Stellit 6
119.-2	plug hard faced	Stellit 6	Stellit 6	Stellit 6	Stellit 6	Stellit 6
123	parallel key	1.7380 nitr.	1.7380 nitr.	1.7380 nitr.	1.7380 nitr.	1.4922
127	cup spring	1.4922	1.4922	1.4922	1.4922	2.4668
* 129	rectangular ring	1.4922 nitr.	1.4922 nitr.	1.4922 nitr.	1.4922 nitr.	Stellite
137	cylindrical pin	Austenit	Austenit	Austenit	Austenit	1.4922
139	retaining nut	1.7380	1.7380	1.7380	1.7380	1.4903
171	stop plate	1.7380	1.7380	1.7380	1.7380	1.4903
Cooling water injection						
Integral steam desuperheating orifice						
527	pipe	1.0460	1.7335	1.5415	1.7380	1.7380
528	spout piece	1.4922	1.4922	1.4922	1.4922	1.4922
529	nozzle body	1.4922	1.4922	1.4922	1.4922	1.4922
530	nozzle	1.4922	1.4922	1.4922	1.4922	1.4922
Nozzle complete						
3	flange	1.0460	1.7335	1.5415	1.7380	1.7380
8	flange	1.0460	1.7335	1.5415	1.7380	1.7380
18	load carrying tube	1.7335	1.7335	1.7335	1.7335 / 1.7380	1.7335 / 1.7380
59	perforated disc	1.7335	1.7335	1.7335	1.7335 / 1.7380	1.7335 / 1.7380
87	pin / bolt	Austenit	Austenit	Austenit	Austenit	Austenit
265	stud	1.7709	1.7709	1.7709	1.7709	1.7709
266	hexagon nut	1.7258	1.7258	1.7258	1.7258	1.7258
* 268	gasket	Austenit - Grafit	Austenit - Grafit	Austenit - Grafit	Austenit - Grafit	Austenit - Grafit
273	stud	1.7709	1.7709	1.7709	1.7709	1.7709
274	hexagon nut	1.7258	1.7258	1.7258	1.7258	1.7258
* 284	gasket	Austenit - Grafit	Austenit - Grafit	Austenit - Grafit	Austenit - Grafit	Austenit - Grafit
528	spout piece	1.4922	1.4922	1.4922	1.4922	1.4922
529	nozzle body	1.4922	1.4922	1.4922	1.4922	1.4922
530	nozzle	1.4922	1.4922	1.4922	1.4922	1.4922
540	out-of-flange	1.7335	1.7335	1.7335	1.7335 / 1.7380	1.7335 / 1.7380
541	pipe	1.7380	1.7380	1.7380	1.7380	1.7380
542	connection pipe	1.7380	1.7380	1.7380	1.7380	1.7380

* Recommended spare parts

Main Dimensions and Characteristic Data of HP Steam Bypass Valve

Dimensions valve bodies Pipe connections and weights

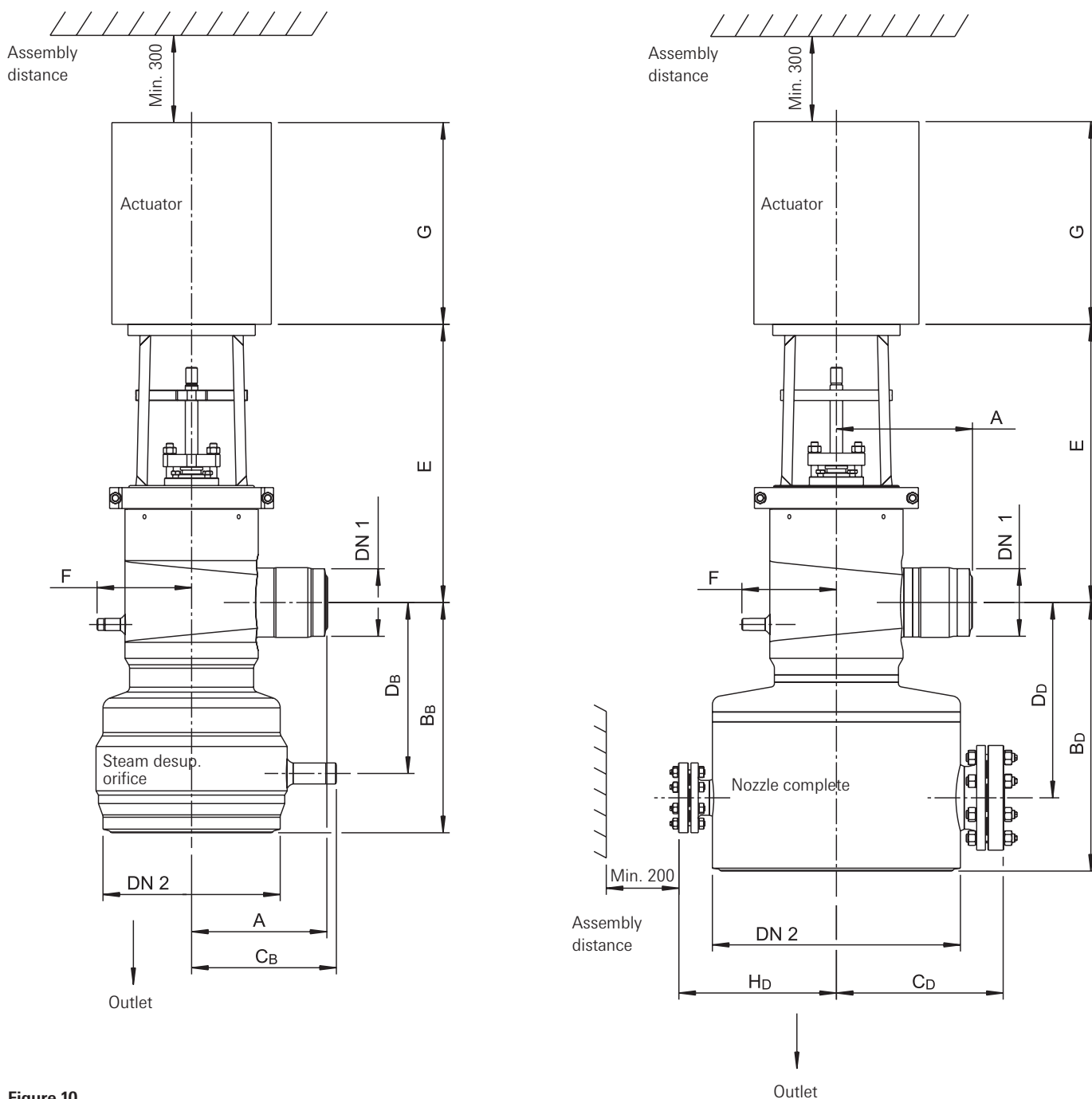


Figure 10

Actuators

Valves of type 115 can be equipped with all commercial electric, pneumatic and hydraulic actuators.

Table 2 - Dimensions & weights

BG	seat	lift	DN1 inlet	DN2 outlet	A	E	E1	F	Steam								Weight (kg)	
									desuperh. orifice			Nozzle complete						
									BB	CB	DB	BD	BD1	CD	DD	DD1		HD
80			65	200					460	265	340	--	--	--	--	--	--	230
	55	45	80	250	250	630	680	205	490	290		--	--	--	--	--	--	250
	70		125	300					500	315		--	--	--	--	--	--	270
100			80	250					560	290	420	--	--	--	--	--	--	350
	70	60	100	300	290	650	710	225		315		--	--	--	--	--	--	400
	90		150	400					575	365		--	--	--	--	--	--	460
125			100	300	330				600	315	440	--	--	--	--	--	--	520
	90	60	125	400		670	740	253		365		--	--	--	--	--	--	590
	110		200	500	360					415		--	--	--	--	--	--	650
150			125	350	390	710	780	271	660	335	490	--	--	--	--	--	--	650
			150	400						365		--	--	--	--	--	--	690
	110	70	200	500						415		--	--	--	--	--	--	780
	130		250	600	430				675	465		780	840	450	500	560	445	
200			150	400		800	870	292	745	365	575	--	--	--	--	--	--	970
			200	500	420					415		--	--	--	--	--	--	1040
	130	80	250	600					760	465		865	925	450	585	645	445	1160
	155		300	700	470				--	--	--	795	925	485	585	645	480	
250			200	500		860	940	326	800	415	640	--	--	--	--	--	--	1330
			250	600	470				850	465		915	975	450	635	695	445	1460
	155	90	300	700					--	--		--	845	905	485		480	1570
	180		350	800	520				--	--	--	--	925	535		715	530	
300			250	600		910	990	352	880	465	690	980	1040	450	700	760	445	1680
			300	700	520				--	--	--	910	970	485			480	1910
	180	105	350	800					--	--	--	--	--	535		780	530	2060
	205		400	900	550				--	--	--	--	--	585			580	
350			300	700		1010	1080	378	--	--	--	980	1040	485	770	830	480	2150
			350	800	560				--	--	--	--	1060	535		850	530	2380
	205	120	400	900					--	--	--	--	--	585			580	2560
	235		450	1000	610				--	--	--	--	1080	635		870	630	
400			350	800		1030	1120	401	--	--	--	1010	1090	535	800	880	530	2770
			400	900	630				--	--	--	--	--	585			580	3100
	235	125	450	1000					--	--	--	--	1110	635		900	630	3350
	260		500	1200	670				--	--	--	--	--	735			730	

Notes

Other combinations and dimensions on request

- G = Acc. to actuator specification
- BG = Size
- E1 = Definition as "E", but control valve with balanced trim
- BD1 + DD1 = Definition as "BD" and "DD", but nozzle with additional perforated disc

Weights including pressure balance trim and bonnet

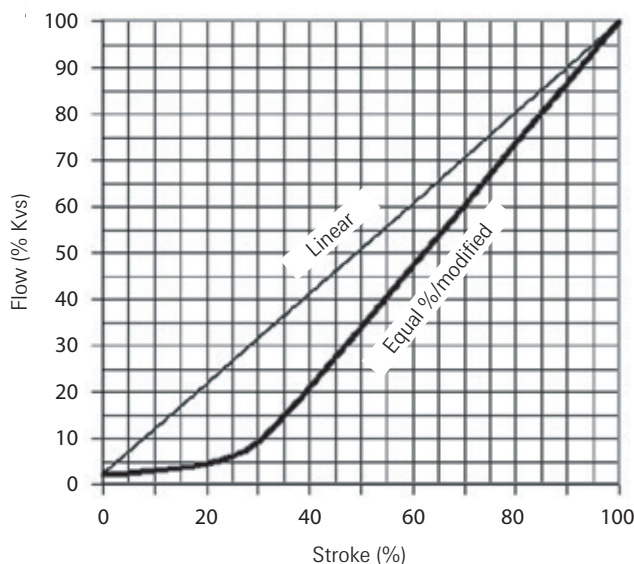
Table 3 - Kvs-Values of the HP steam bypass valves, seat diameters, valve strokes and the pertaining max. Kvs-values

BG	80		100		125		150		200		250		300		350		400	
lift	45		60		60		70		80		90		105		120		125	
seat	55	70	70	90	90	110	110	130	130	155	155	180	180	205	205	235	235	260
stage	Complete - Kvs max (m³/h) [linear]																	
1	60	90	90	165	165	240	240	360	360	540	540	715	715	910	910	1250	1250	1575
2	58	86	88	160	150	220	230	335	345	505	505	660	675	845	860	1145	1145	1415
3	56	81	85	150	150	210	220	310	325	475	475	610	630	785	810	1055	1055	1275
4	51	76	80	140	135	185	200	285	310	440	440	560	590	710	740	965	960	1165
5	45	--	70	--	120	--	185	--	280	--	400	--	520	--	685	--	885	--
6	Orifice/disc in outlet extension																	

Notes

- BG = size
- Equal percent start and special characteristics on request
- Conversion factor into Cvs values:
Cvs [gal./min] = 1,17 Kvs [m³/h]
- Feasibility depending on use conditions

Figure 11
Flow characteristic



Characteristic Curves

The HP steam bypass valves can be delivered with different flow characteristics. As basic characteristic curve the linear characteristic is provided.

Table 4 - Application Limits Subject to Pressure and Temperature

Body material		Application range														
X10 CrMoVNb 91	1.4903	Design temperature [°C]														
	DIN EN 10222-2	500	520	530	540	550	560	570	580	585	590	595	600	605	610	615
p max [bar]		475	404	370	336	304	272	244	216	203	191	180	169	157	146	137
Body material		Application range														
11 CrMo 9-10	1.7383	Design temperature [°C]														
	DIN EN 10222-2	380	400	420	440	460	480	500	510	520	530	540	545	550	555	560
p max [bar]		317	310	302	295	287	280	269	236	204	177	152	142	129	120	111
Body material		Application range														
13 CrMo 4-5	1.7335	Design temperature [°C]														
	DIN EN 10222-2	360	380	400	420	440	460	480	490	500	510	520	525	530	535	540
p max [bar]		308	304	300	292	285	280	276	274	259	216	171	155	139	126	112
Body material		Application range														
16 Mo 3	1.5415	Design temperature [°C]														
	DIN EN 10222-2	200	250	300	320	340	360	380	400	410	420	430	440	450	455	460
p max [bar]		338	310	272	268	264	261	257	253	251	249	248	246	244	243	242
Body material		Application range														
P250 GH	1.046	Design temperature [°C]														
	DIN EN 10222-2	140	200	260	300	320	340	360	370	380	390	400	405	410	415	420
p max [bar]		327	291	246	216	204	193	180	172	165	157	150	146	142	139	135

Example Coding System

115L 0100 0150 0400 130 5 B S 13 28 XXX

Valve type

115L	Without pressure balance
115H	Pressure balance without pilot disc
115N	Press. balance + pilot disc without springs
115M	Press.balance + pilot disc with springs

Inlet nominal size

0080	=	DN	80
0100	=	DN	100
0125	=	DN	125
0150	=	DN	150
0200	=	DN	200
0250	=	DN	250
0300	=	DN	300
0350	=	DN	350
0400	=	DN	400
0450	=	DN	450

Size

0080	=	DN	80
0100	=	DN	100
0125	=	DN	125
0150	=	DN	150
0200	=	DN	200
0250	=	DN	250
0300	=	DN	300
0350	=	DN	350
0400	=	DN	400

Outlet nominal size

0150	=	DN	150
0200	=	DN	200
0250	=	DN	250
0300	=	DN	300
0350	=	DN	350
0400	=	DN	400
0450	=	DN	450
0500	=	DN	500
0600	=	DN	600
0700	=	DN	700
0800	=	DN	800
0900	=	DN	900

Accessories

See TO.108.00.xxxx ED

Max. design (pressure rate)

28 = PN 320

Material Specification

01	body	1.0460
10	body	1.7335
11	body	1.5415
13	body	1.7383
30	body	1.4903

Pipe Connection

S Welding end
F Flange

Steam Bypass

B Steam desup. orifice
D Nozzle complete

Stages

2	=	2 Stages
3	=	3 Stages
4	=	4 Stages
5	=	5 Stages
6	=	6 Stages

Seat diameter

055	=	ø 55
070	=	ø 70
090	=	ø 90
110	=	ø 110
130	=	ø 130
155	=	ø 155
180	=	ø 180
205	=	ø 205
235	=	ø 235
260	=	ø 260