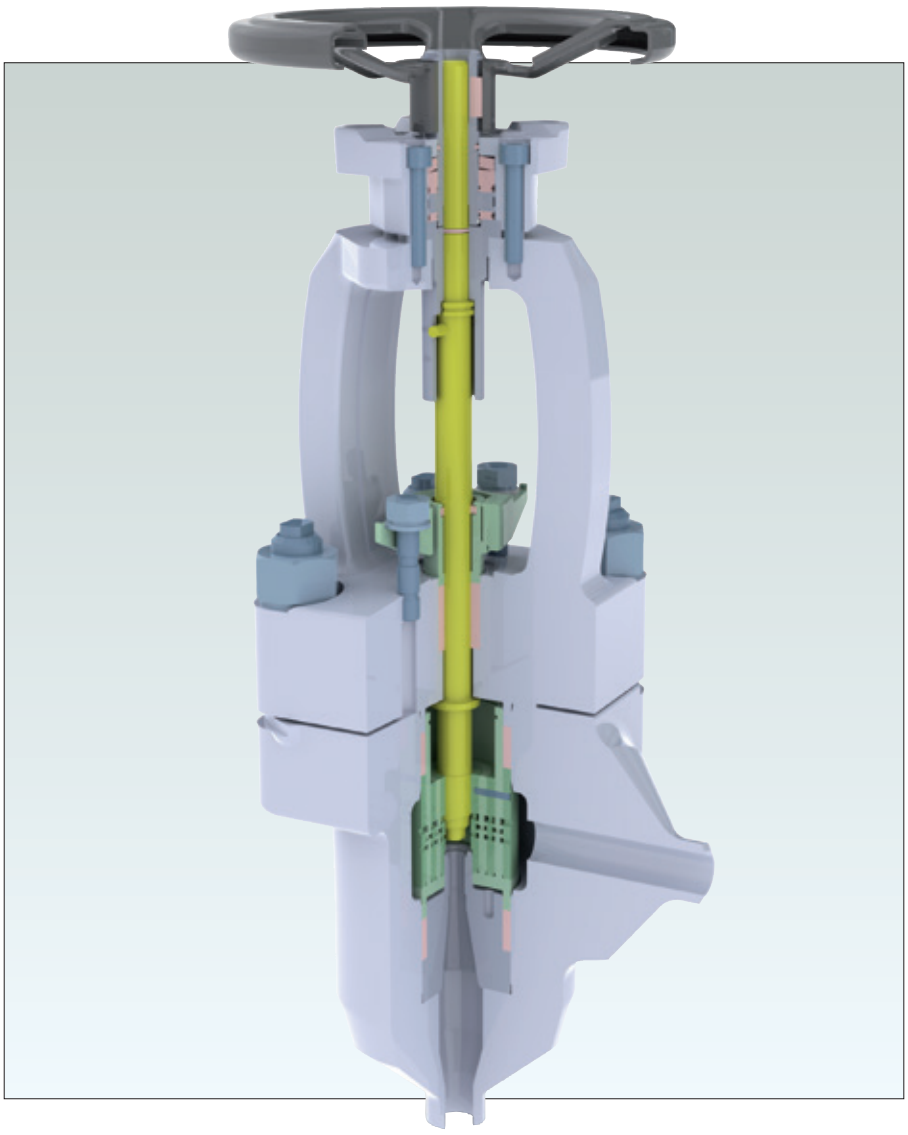
PENTAIR

SEMPELL

Specially designed low-maintenance control valves for a wide range of applications in water circulation



Features and benefits

- modular design
- the valve is suitable for continuous operation
- good adjustment to the task by narrowly staged Cv-value-series and large control ratio
- trims can be changed easily while valve is welded into pipe
- different plug types available
- minimized wear and tear through separation of sealing and control area at high Δp
- different actuator types can be used
- with low-friction PTFE packing at design temperatures ≤ 480°F
- resistant for standard pickling process
- the stem nut can be re-lubricated during operation
- thermal expansion by high temperature differences at stem will be balanced by cup spring in yoke head

Applications

Spraywater Control valve
Start-up valve
Feedpump Re-circulation valve

Use and application

The series 142 as angular Spraywater Control valve is designed for the following applications:

- boiler injections into the final superheater stages at the HP and reheater
- injection at HP/IP Bypass valves with or without safety function
- injection into or directly behind Steam Transforming valves for process steam
- Feedwater Start-up Control valve
- Minimum Flow valve at feedwater pumps
- Blow-down valve at drum boilers

The valve type covers the complete pressure and temperature ranges up to about 7000 psig and 750°F. The bodies are forged. The narrowly scaled Cv values-series and a large control ratio allow an exact adjustment for the respective task. The trims can be easily changed. It is thereby possible to make necessary adjustments in the case that operational conditions change. A combination of material choice and multi stage pressure reduction by radial step system make the valve highly resistant to wear under severe working conditions.

Technical data

Size	:	1" - 6"
Pressure class	:	class 3000
Body material	:	A105 A182 F12 / A182 F22 special design
Trim material	:	stem 1.4057 / 1.4122 (17% Cr steel) cages 1.4057 / 1.4122 (17% Cr steel) seat ring 1.4057 / 1.4122 (17% Cr steel)
Stem sealing	:	PTFE (up to 480°F), pure graphite
Plug design	:	A-type - parabolic Flow To Close (FTC) L-type - multistage Flow To Close (FTC) X-type - single stage Flow To Open (FTO)
Characteristic	:	equal percent (square, linear on request)
Control ratio	:	standard 1:40
Sealing seat/plug	:	metallic
Leakage class	:	ANSI / FCI 70-2 class V DIN EN 12266-2 class B

www.pentair.com/valves

Design size I + II

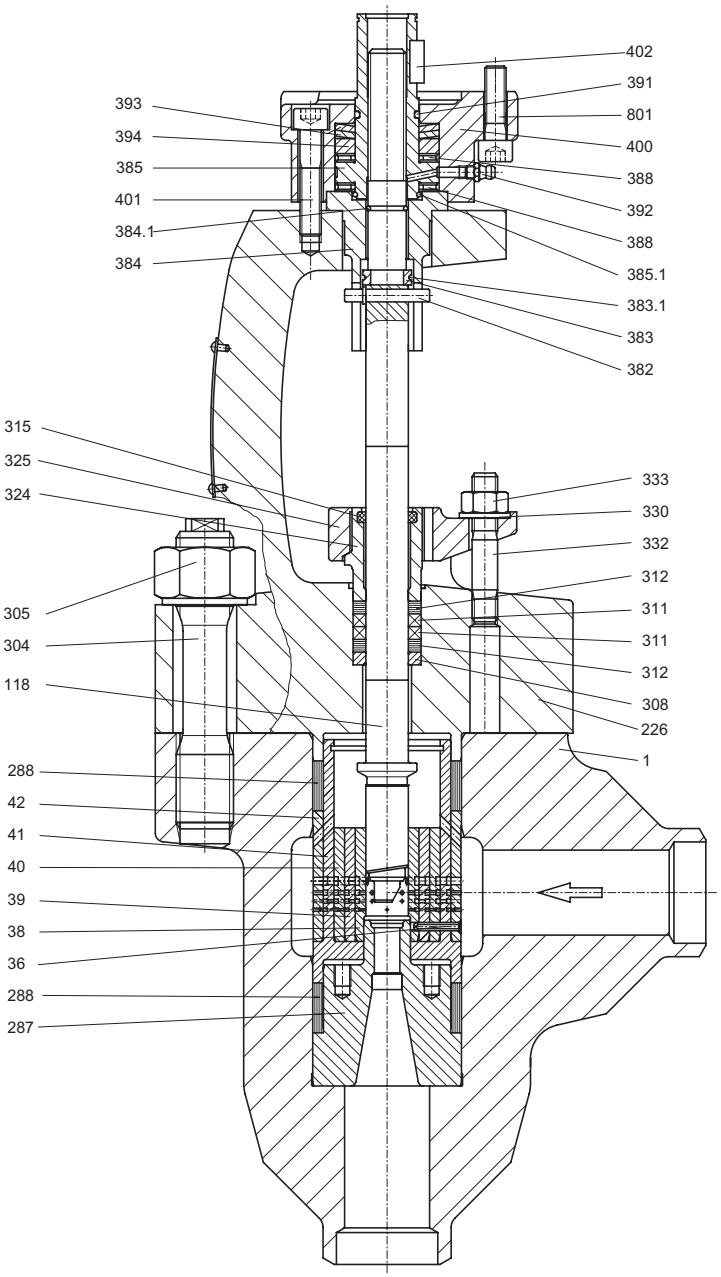


Figure 1

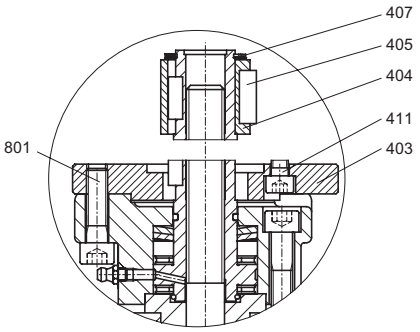


Figure 2
Actuator connecting parts for output drives acc. to ISO 5210
(accessories: SN 33 A1- A4, 33 B1-B4)

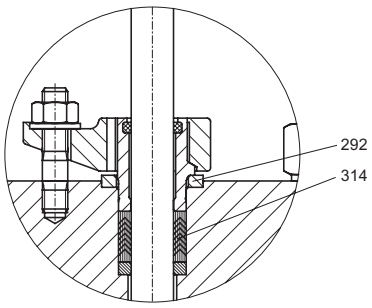


Figure 3
Packing-V-type for design temperature Ta ≤ 480°F

Design size III

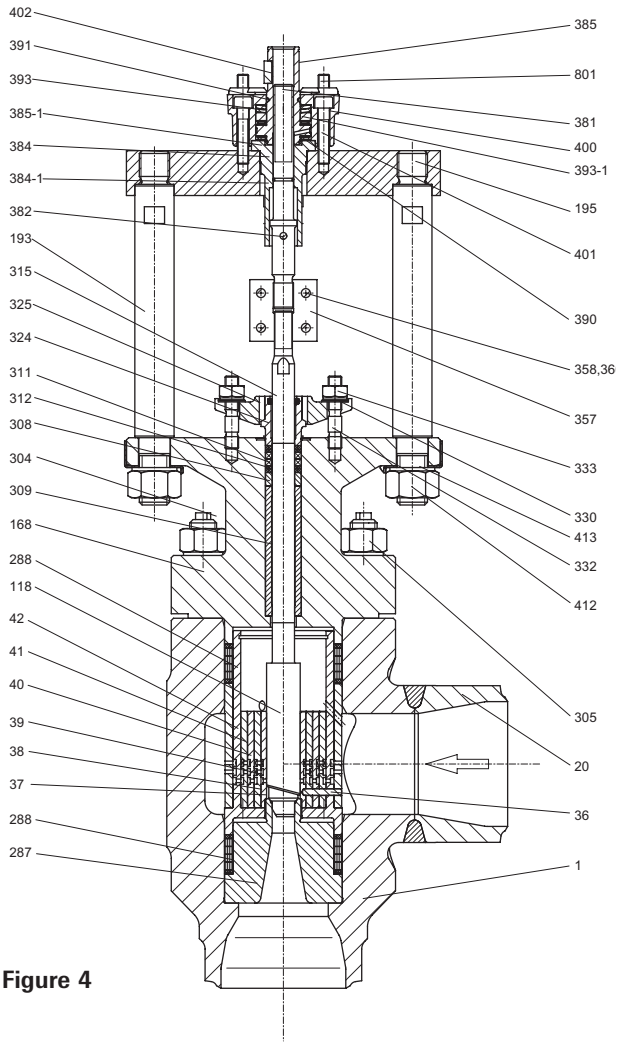


Figure 4

Design size IV

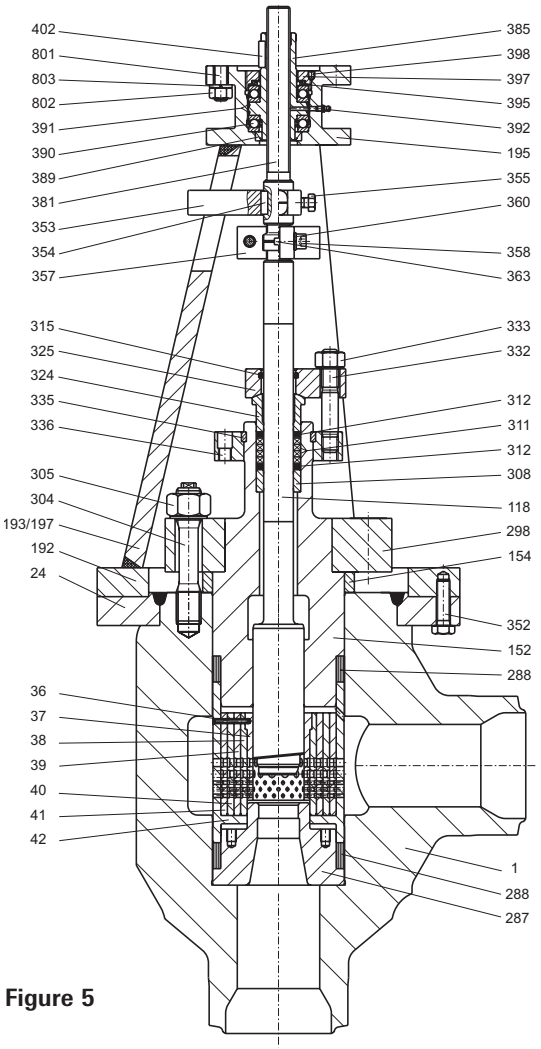


Figure 5

Trims

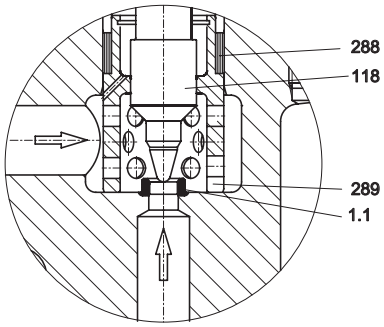


Figure 6
A-type: single stage with parabolic disk,
flow tends to open / close

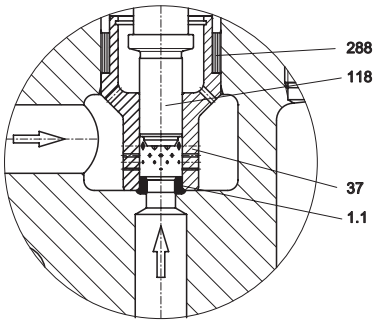


Figure 7
X-type: single stage with piston plug,
flow tends to open / close

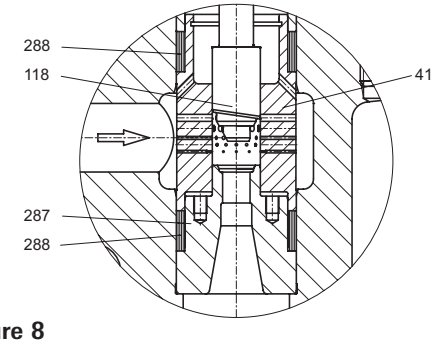


Figure 8
L-type: single stage with piston plug,
flow tends to close

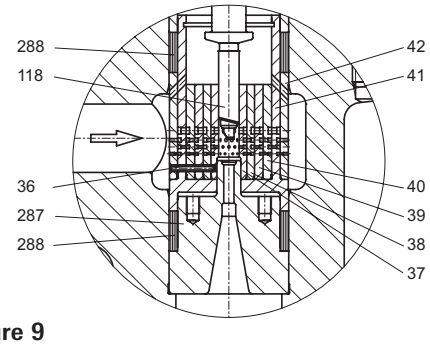


Figure 9
6 stages
Type L, multi stage (2 - 6 stages) with piston plug,
flow tends to close

Table 1 - Materials, material specification

	Pos.	Name	ASME-material	
			51	60/63
	1	body	A105	A182F12/A182F22
	(20)	connecting piece	A105	A182F12/A182F22
	24	flange	A105	A182F12
Design A-type (parabolic plug)				
	1.1	seat hard faced	1.4115	
*	118	stem plug	1.4057/1.4122	
*	289	thrust ring	1.4057/1.4122	
Design X-type (piston plug single stage)				
	1.1	seat hard faced	1.4115	
*	118	stem plug	1.4057/1.4122	
*	37	cage	1.4057/1.4122	
Design L-type (piston plug 1-6 stages)				
	36	cylindrical pin	Austenite	
*	37-42	cage	1.4057/1.4122	
*	118	stem plug	1.4057/1.4122	
*	287	seat ring	1.4057/1.4122	
	152	closure	A182F12/A182F22	A182F12/A182F22
	168	cover	216WCB	A182F12/A182F22
	192	yoke flange	1.0460	1.7335
	193/197	yoke arm	1.0460	1.7335
	195	yoke head	1.0460	1.7335
	226	yoke	A182F91	
*	288	packing set	Graphite	
	(292)	washer	1.4021	
	298	flange	A182F12/A182F91	
	304	stud	A193 B7	
	305	hexagonal nut	A194GR2H	
*	308	base ring	1.4021	
*	309	thrust ring	1.4021	
*	311	packing ring	Graphite	
*	312	packing ring	Graphite / Austenite	
*	(314)	packing V-type	Teflon	
*	315	wiper	Graphite	
	324	gland shaft	1.4027	
	325	gland flange	1.4317	
	330	washer	St.	
	332	stud	1.7709	
	333	hexagonal nut	1.7258	
	335	divided ring	1.5415	
	336	fixing ring	1.7335	
	352	hexagonal screw	8.8	
	353	clamp	1.0425	
	354	parallel key	1.0503	
	355	hexagon screw	8.8	
	357	coupling	1.4057	
	358	allen bolt	8.8	
	360	spring washer	Fe-St.	
	363	parallel key	1.0503	
	381	screw stem	1.8550	
	382	guide bolt	1.4122	
	383	split ring	1.4122	
	383.1	ring	1.4310	
	384	guide bush	1.4021	
	384.1	sealing ring	FPM	
*	385	threaded bush	1.8550	
	385.1	circlip	Fe-St.	
	388	axial needle bearing	KI-St	
	389	oil seal ring	NBR	

Table 1 - Materials, material specification

	Pos.	Name	ASME-material	
			51	60/63
*	390	ball bearing	St.	
*	391	sealing ring	NBR	
	392	lubrication nipple	5.8	
	393	cup spring	1.8159	
	393.1	ring	1.4021	
	394	cup spring ring	1.4021	
*	395	annular spring	1.8159	
	397	retaining nut	1.4021	
	398	grub screw	5.8	
	400	yoke head	1.0460	
	(401)	allan bolt	8.8	
	402	parallel key	1.0503	
	(403)	connecting flange	1.0460	
	(404)	bush	1.0503	
	(405)	parallel key	1.0503	
	(407)	retaining ring	Fe-St.	
	411	stud	8.8	
	412	hexagon nut	8	
	413	spring washer	Fe-St.	
	801	stud	8.8	
	802	hexagon nut	8	
	803	spring washer	Fe.-St	

* Recommended spare parts

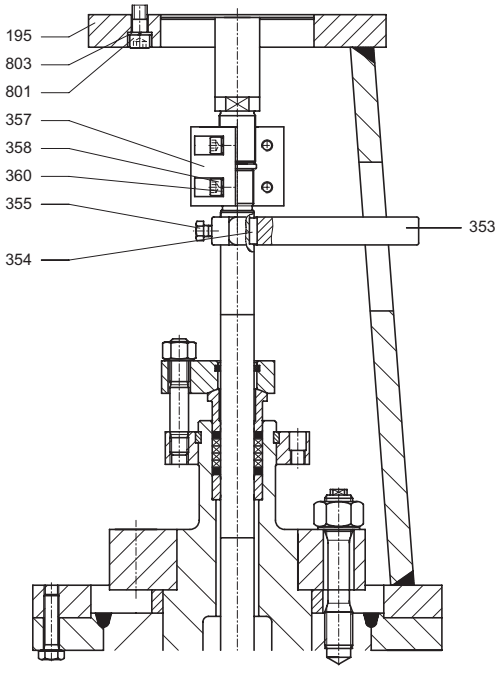


Figure 10
Size I - III
Detail for connecting pneumatic actuator

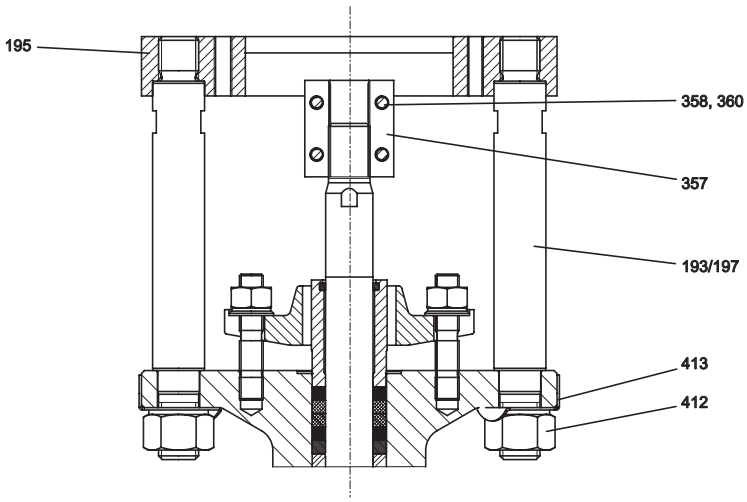


Figure 11
Size IV
Detail for connecting linear, hydraulic or pneumatic piston actuator

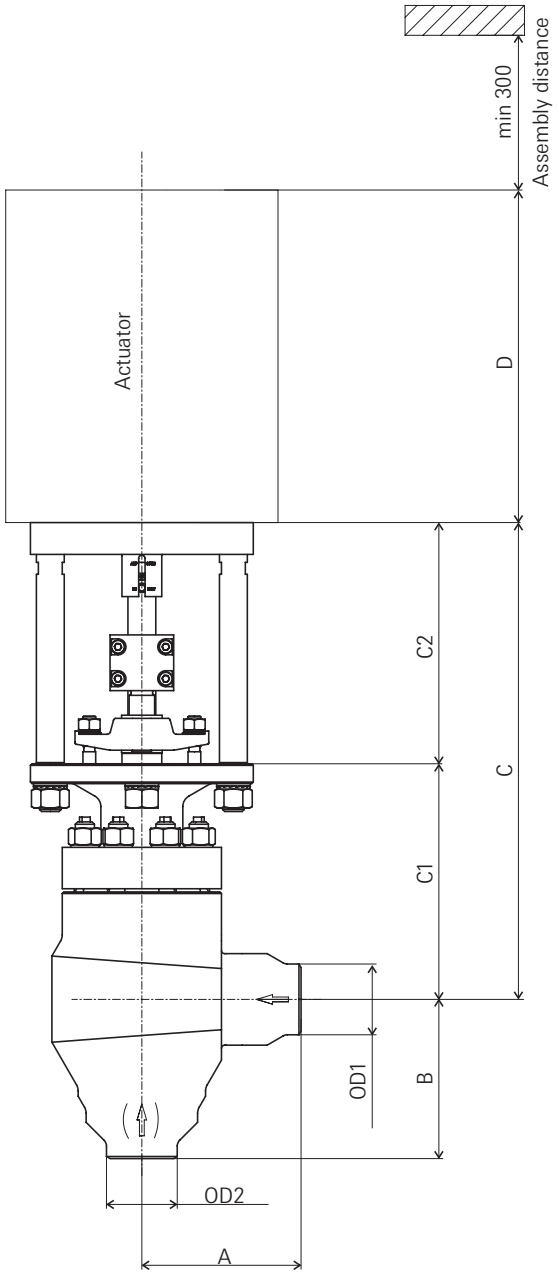


Figure 12
Actuators

Valves of Type 142 can be equipped with all commercial electric, pneumatic and hydraulic actuators.

Notes

* without actuator
C E-actuator
C1 preparation for pneumatic-, hydraulic actuator
C2 size depends on actuator design
D see actuator

Table 2 - Dimensions & weights

Size	NPS	OD1 [mm]	OD2 [mm]	A [mm]	B [mm]	Stroke [mm]	C [mm]	flange ISO 5210	C1 [mm]	C2 [mm]	D [mm]	Weight* [kg]
Size I	1″ to 1 1/2″	33,7 to 48,3	33,7 to 48,3	90	125	15-30	260	F07 - F10 B1 (B2)	90	max. 420	see actuator	ca.32
Size II	2″ to 3″	60,3 to 88,9	60,3 to 88,9	150	175	15-30	380	F07 - F10 B1 (B2)	140	max. 420	see actuator	ca.60
Size III	2,5″ to 5″	76,1 to 139,7	76,1 to 139,7	200	200 225	15-50	660	F10 - F14 B1 -B2	296	max. 500	see actuator	ca.150
Size IV	3″ to 6″	88,9 to 168,3	88,9 to 168,3	300	300	30-70	830+ stroke	F10 - F16 B1 (B2)	200	max. 740	see actuator	ca.360

Table 3 - Cvs-values of the HP Feedwater Control valves, seat diameters, valve strokes and the pertaining max. Cvs-values

		Seat diameter [mm]												
		4	6	8	12	16	20	25	30	38	48	60	74	90
		Stroke [mm]												
Type	A/X	15	15	15	30	30	30	30	30	30	30	50	50	70
Type	L	15	15	15	30	30	30	30	30	30	50	50	70	70
Type	**Stages**	Cvs max [usgpm]												
A	1	0,47	0,94	1,87	4,68	7,37	11,7	18,7	29,3	46,8	46,8	74	117*	117*	187,2	293*
X	1	0,29	0,59	1,17	2,93	4,68	7,37	11,7	18,7	29,3	29,3	47	74*	74*	117	187*
L	1	0,29	0,59	1,17	2,93	4,68	7,4	11,7	18,7	29,3	29,3	47	74*	74*	117	187*
	2	0,27	0,59	1,05	2,7	4,8	7,9	11,7	17	27,14	27,1	43,3	67,9		103	
	3	0,18	0,4	0,71	1,87	3,28	5,03	7,8	11,3	18,3	29,3	45,6	69			
	4	0,14	0,33	0,6	1,52	2,7	4,2	6,6	9,5	15,1	24,6	37,4	57,3			
	5	0,12	0,26	0,47	1,17	2,3	3,6	5,7	8,2	13,2	21,1	32,8				
	6	0,12	0,23	0,5	1,2	2,1	3,3	5,1	7,4	11,7	18,7					

Size I Size II Size III Size IV

Figure 13
Flow characteristic

The HP Feedwater Control valves can be delivered with different flow characteristics.

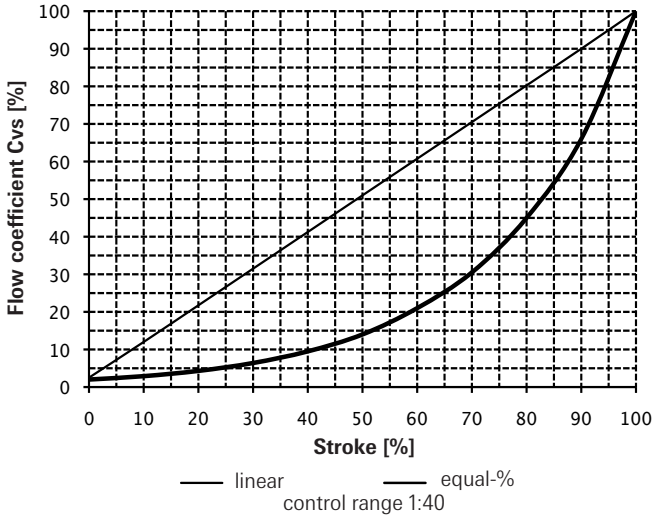


Table 4 - Application limits subject to pressure and temperature

		Standard Class - Application range ASTM materials (psig/°F)										
		Design temperature [°F]										
ASME	**Body**	100	200	300	400	450	500	550	600	650	700	750
Class 3000	**material**	Allowable working pressure [psig]										
Size I	A105	6400						6100	5850	5750	5700	5400
	A182F22	6900	6900	6700	6650		6550		6450	6300	6050	5700
Size II	A182F22	6600				6400	6250	5950	5700	5600	5550	5250
	A182F22	6750						6600	6300	6150	5900	5550
Size III	A105	4650	4250	4100	4000	3850	3750	3600	3400	3350	3350	3150
	A182F12	4700	4700	4550	4350	4250	4200	4000	3800	3700	3550	3350
Size IV	A105	6800	6800	6600	6450	6400	6400	6400	6300	6150	6100	5800
	A182F12	> 7000							6950	6750	6500	6100
		Application range ASTM materials Special Class (psig/°F)										
		Design temperature [°F]										
ASME	**Body**	100	200	300	400	450	500	550	600	650	700	750
Class 3000	**material**	Allowable working pressure [psig]										
Size I	A105	6400									6050	5400
	A182F22	6900	6900	6700	6650					6500	6400	6300
Size II	A182F22	6600									6250	5550
	A182F22	6750								6650	6600	6550
Size III	A105	6150										
	A182F12	6150										
Size IV	A105	> 7000									6850	6150
	A182F12	> 7000										6900

Example coding system

142L • 100 • 1 • 13 • 2 • 2 • 2 • Z • A • XXX

Valve type

142 A	Internal fitting (parabolic plug)
142 L	- (piston plug 1-6 stages)
142 X	- (piston plug single stage)

Valve code

100	Standard

Flow direction

1	Oncoming flow above disc (in closing direction)
2	Oncoming flow below disc (against closing direction)

Material specification

51	Body	A105
63	Body	A182F22

Inlet nominal size

1	=	NPS 1"
1 1/4	=	NPS 1 1/4"
1 1/2	=	NPS 1 1/2"
2	=	NPS 2"
2 1/2	=	NPS 2 1/2"
3	=	NPS 3"
4	=	NPS 4"
5	=	NPS 5"
6	=	NPS 6"

Accessories

see TO.097.00.xxxx.ED

Pipe connection

S	Welding end acc. to DIN
W	Weld. end acc. to ASME
U	Plain ends

Body type

E	Angle type
Z	Z-type

Outlet nominal size

1	=	NPS 1"
1 1/4	=	NPS 1 1/4"
1 1/2	=	NPS 1 1/2"
2	=	NPS 2"
2 1/2	=	NPS 2 1/2"
3	=	NPS 3"
4	=	NPS 4"
5	=	NPS 5"
6	=	NPS 6"

Nominal size body

1	=	Size I
2	=	Size II
3	=	Size III
4	=	Size IV