

SEMPELL

Sempell controlled and uncontrolled Non-Return or Swing Check Valves prevent unallowable pressure built up in the turbine coming due to back-flowing steam.

Features and Benefits

- low maintenance gland can be retightened
- hardfaces sealing faces at disc and body seat
- low friction by burnished shaft
- surfaces treated bearing faces on each part with relative motion
- easy to disassemble bodies
- low resistance coefficient λ by favorable flow characteristic of internal structure
- actuator mounting right or left possible seen from steam flow direction
- universal connections by various design of welding ends or direct welding-in
- deviating designs of welding ends in regard of dimension and material as well as other actuators, limit switches and special designs according to customers' request can be supplied.

Use and application of non-return valves

Type 801 is a controlled non-return valve and installed into the steam line between outlet turbine and HRSG reheater. It protects the HP turbine against backflow of the steam flow from the cold reheat line in case of standstill or at no-load condition.

Under normal operating conditions the non-return valve is kept in open position by the actuator. The disc is completely out of the steam flow. In case of malfunction the non-return valve will be closed. The closing will be initiated by an impulse and a closing spring within the actuator. The closed final position and the sealing in this position is reached by the steam pressure.

The non-return valve starts opening again from a pressure difference of about 1 bar.

The closing spring is so dimensioned that the non-return valve does not remain in closed position. Thus, no overpressure can be built in the HP part of the turbine.

By mounting limit switches the positions OPEN/CLOSED are indicated.



Technical data

Size	: DN 350- DN 1000
Pressure Class	: PN 64
Connections	: Welding ends acc. to DIN
Body material	: GS-17CrMo55 (1.7357)
Materials internals	: Shaft 1.4122 nitriding Disc lever = body material Hardfacings 1.4115 Bearing sleeve 1.8550 nitriding
Body sealing	: Cover screwing with serrated gasket
Shaft sealing	: Moulded graphit packing rings
Shaft design	: Controlled, burnished, resting into two bushes
Closing time	: < 2 sec.
Sealing body / disc	: metallic
Leakage class	: Leakage rate 2 acc. to DIN 3230 part 3 or IEC 534 part 4, Class IV, test course 2, medium L
Possible flow medium	: water, steam, gas, oil

Figure 1
Design Non Return Valve

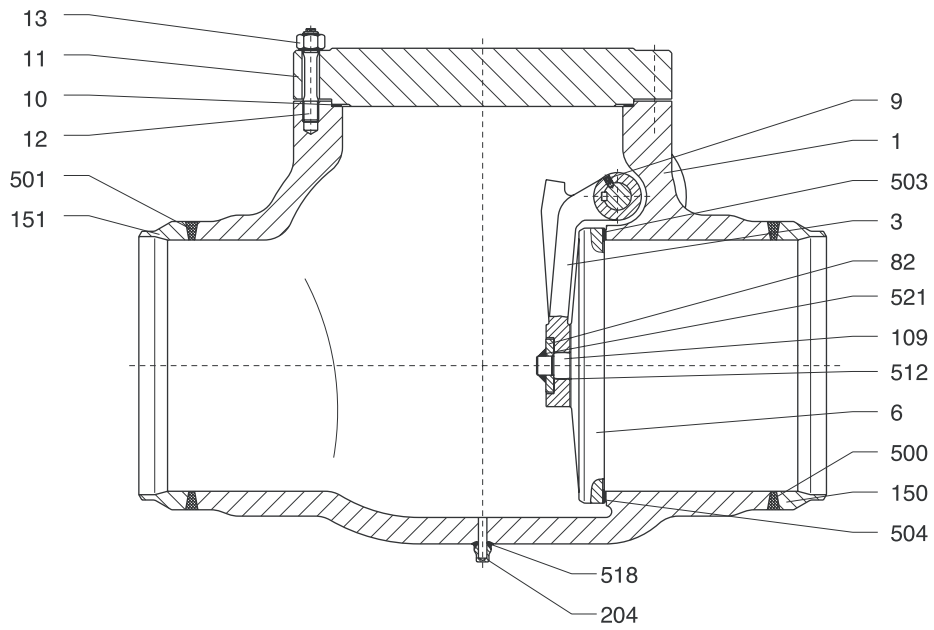


Figure 2
Design with pneumatic part-turn actuator up to nominal size 700

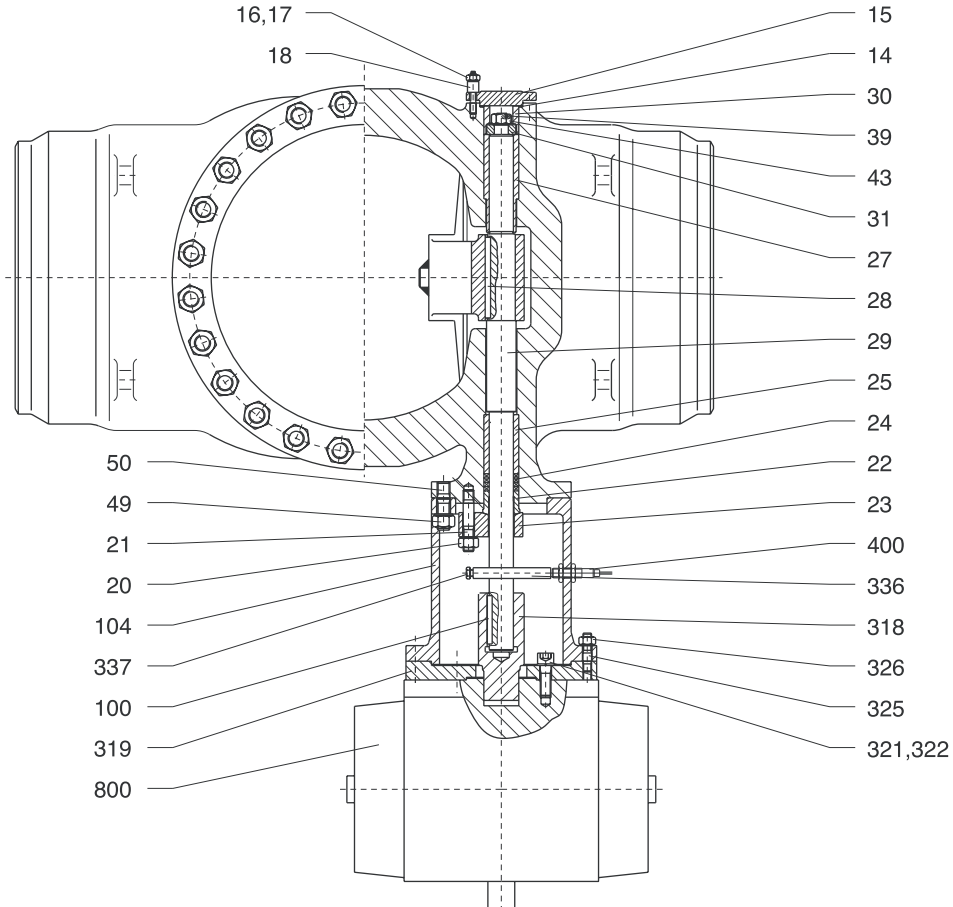


Figure 3

Design with pneumatic multi-turn actuator from nominal size 800

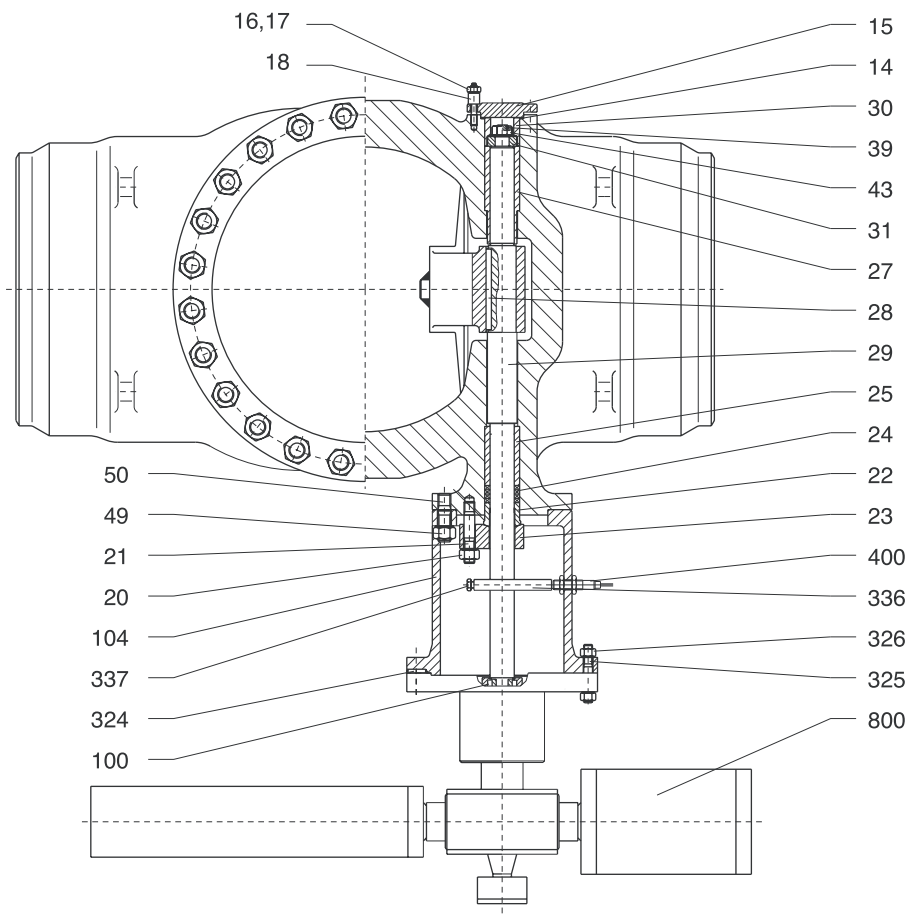


Table 1 - Materials, material specification

Pos.	Name	DIN-Material	Pos.	Name	DIN-Material
1	Body	1.7357	31 •	Bearing Ring	1.8550
3	Disc Lever	1.7357	39	Threaded Pin	Austenit
6	Disc	1.7335	43	Hexagonal Nut	1.7258
10 •	Gasket	1.4541 / Graphite	49	Hexagonal Nut	1.7258
11	Cover	1.7335	50	Stud Screw	1.7709
12	Stud	1.7709	82	Washer	1.5415
13	Hexagonal Nut	1.7258	100 •	Parallel Key	1.4122
14 •	Gasket	1.4541 / Graphite	104	Connecting Piece	1.0619
15	Cover	1.7335	109	Bolt	1.5415
16	Hexagonal Nut	1.7258	150	Pipe Connection	1.7335 / 1.5415
17	Stud	1.7709	151	Pipe Connection	1.7335 / 1.5415
18	Expansion Sleeve	1.7709	204	Drainage Nozzle	1.7335 / 1.5415
20	Hexagonal Nut	1.7258	318	Distance Piece	1.4122
21	Stud Screw	1.7709	319	Intermediate Flange	1.0425
22	Gland	1.8550	321	Lock Washer	Steel
23	Gland Flange	1.7335	322	Allan Bolt	8.8
24 •	Packing Ring	Graphite	325	Stud Screw	1.7709
25 •	Bearing Sleeve	1.8550	326	Hexagonal Nut	1.7258
27 •	Bearing Sleeve	1.8550	336	Switch Segment	1.0425
28 •	Parallel Key	1.4122	337	Hexagonal Screw	8.8
29 •	Shaft	1.4122	400 •	Proximity Switch	Div.
30 •	Bearing Sleeve	1.8550	800	Actuator	Div.

Notes

- Recommended spare parts

Non-Return Valves - Type 801 DIN

Possible applications

Main steam

Hot reheat

1. Cold Reheat Non Return Valve
2. Pneumatic Actuator
3. Solenoid Valves (deenergized)
4. Limit Switch

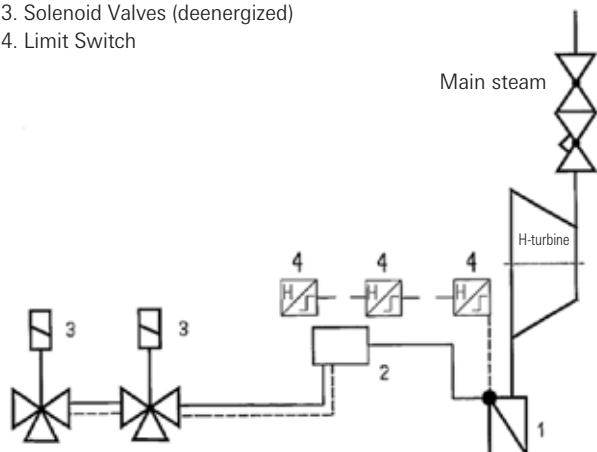


Figure 4

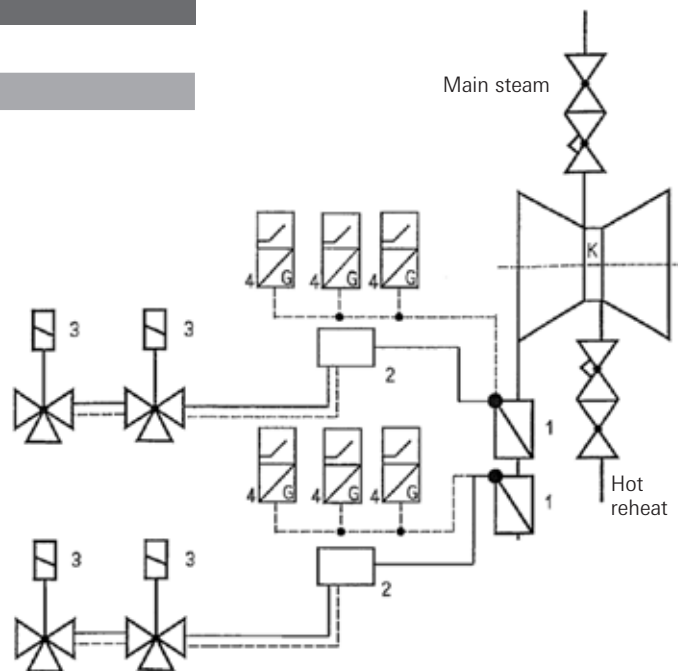


Figure 5

Main dimensions and characteristic data of Non-Return Valves

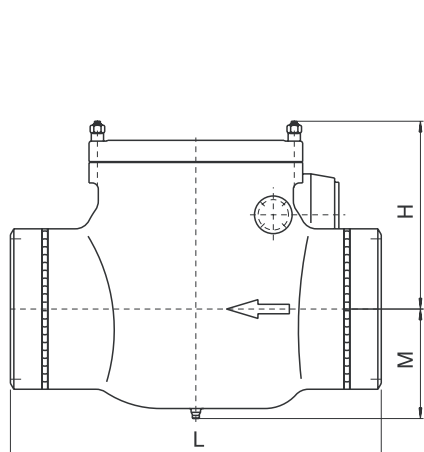


Figure 6

Drawing with welding ends and pneumatic actuator on the right

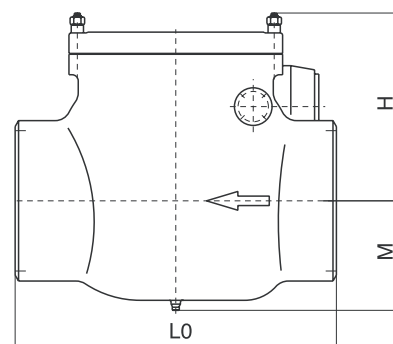
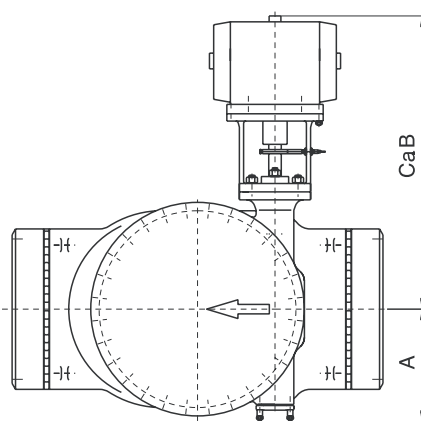


Figure 7

Drawing without welding ends

Table 2 - Dimensions and weights

Dimensions [mm]								Weight without actuator [kg]	
DN	seat Ø	L	L0	A	B	H	M	without	welding
350	330	1000	800	270	960	420	260	950	1050
400	330	1000	800	270	960	420	260	950	1150
400	380	1100	900	320	1040	530	310	1145	1249
450	380	1200	900	320	1040	530	310	1145	1350
450	425	1200	1000	355	1175	570	350	1295	1405
500	425	1300	1000	355	1175	570	350	1295	1510
500	475	1300	1100	385	1280	600	375	1435	1550
550	475	1450	1100	385	1280	600	375	1435	1660
550	520	1450	1230	440	1400	660	425	2005	2150
600	520	1600	1230	440	1400	660	425	2005	2275
600	570	1600	1400	480	1485	715	450	2540	2700
650	570	1800	1400	480	1485	715	450	2540	2900
700	570	1900	1400	480	1485	715	450	2540	3135
700	670	1900	1600	540	1555	830	530	4355	4650
750	670	1950	1600	540	1555	830	530	4355	4695
800	670	2150	1600	540	1555	830	530	4355	5065
800	760	2150	1880	610	1650	935	600	6815	7170
900	760	2400	1880	610	1650	935	600	6815	7710
900	860	2400	2120	675	1815	1060	670	8845	9300
1000	860	2700	2120	675	1815	1060	670	8845	10350

Dimensions of feasible welding ends

Table 3 - Straight nominal sizes

DN	Seat	OD	12,5	14,2	16,0	17,5	20,0	22,5	25,0	28,0	30,0
350	330	355,6	•	•	•	•	•				
400	380	406,4	•	•	•	•	•	•			
450	425	457,0	•	•	•	•	•	•			
500	475	508,0		•	•	•	•	•	•		
550	520	559,0		•	•	•	•	•	•		
600	570	610,0			•	•	•	•	•	•	
700	670	711,0			•	•	•	•	•	•	
800	760	813,0				•	•	•	•	•	•
900	860	914,0				•	•	•	•	•	•

Table 4 - Extended pipe connections

DN	Seat	OD	12,5	14,2	16,0	17,5	20,0	22,5	25,0	28,0	30,0	32,0	36,0
400	330	406,4	•	•	•	•	•	•					
450	380	457,0	•	•	•	•	•	•					
500	425	508,0		•	•	•	•	•	•				
550	475	559,0		•	•	•	•	•	•				
600	520	610,0			•	•	•	•	•	•			
650	570	660,0			•	•	•	•	•	•			
700	570	711,0			•	•	•	•	•	•			
750	670	762,0				•	•	•	•	•	•		
800	670	813,0				•	•	•	•	•	•		
900	760	914,0				•	•	•	•	•	•		
1000	860	1016,0					•	•	•	•	•	•	•

Applications limit subject to pressure and temperature

For material GS-17CrMo55 (1.7357) and body design with pipe connections in connection with inspection 3.1A, 3.1B or 3.1C according to EN 10204 (DIN 50059) the application limits can be increased according to table 5.

Table 5 - Application limits

Seat Ø	DN	Temperature in °C - excess pressure in bar						
		300°C	350°C	400°C	450°C	500°C	520°C	540°C
330	350/400							
380	400/450							
425	450/500							
475	500/550	70,7	66,1	63,0	58,4	35,9	25,5	18,7
520	550/600	69,7	65,5	62,2	57,7	35,4	25,1	18,4
570	600/650/700	74,4	69,6	66,3	61,5	37,8	26,8	19,7
670	700/750/800	70,9	66,3	63,2	58,6	36,1	25,6	18,8
760	800/900	74,0	69,2	66,0	61,1	37,6	26,7	19,6
860	900/1000	75,1	70,2	66,9	62,0	38,2	27,1	19,9

Admissible operating pressure for valves (body 1.7357) with welding ends, inspection: EN10204-3.1A, 3.1B, 3.1C

801 - 254 - 10 - 0700 - 670 - 0700 - S - XXX

Valve type

801 Non-Return Valve

Valve Code

254 Actuator left
255 Actuator right

Material Specification

10 body 1.7357

Inlet nominal size

350 = DN 350
400 = DN 400
450 = DN 450
500 = DN 500
550 = DN 550
600 = DN 600
650 = DN 650
700 = DN 700
750 = DN 750
800 = DN 800
900 = DN 900
1000 = DN 1000

Accessories

see TO.130.80.xxxx D E

Pipe Connection

S Welding end acc. to DIN
U Plain ends

Outlet nominal size

350 = DN 350
400 = DN 400
450 = DN 450
500 = DN 500
550 = DN 550
600 = DN 600
650 = DN 650
700 = DN 700
750 = DN 750
800 = DN 800
900 = DN 900
1000 = DN 1000

Seat diameter

330 = Ø 330
380 = Ø 380
425 = Ø 425
475 = Ø 475
520 = Ø 520
570 = Ø 570
670 = Ø 670
760 = Ø 760
860 = Ø 860