Lift Check Valve

RGS

Type Series Booklet

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Type Series Booklet RGS

Contents

Check Valves and Strainers

Lift Check Valves to DIN/EN

RGS

Main applications

- Fossil-fuelled power stations
- Boiler feed applications
- Process engineering
- Petrochemical industry
- Chemical industry
- Shipbuilding
- Paper industry / pulp industry
- Sugar industry
- Descaling units
- Mining
- Nuclear power stations

Fluids handled

- Water
- Steam
- Other non-aggressive fluids such as gas or oil on request.

Operating data

Table 1: Operating properties

Characteristic	Value
Nominal pressure	PN 250 - 400
Nominal size	DN 10 - 50
Max. permissible pressure [bar]	400
Min. permissible temperature [°C]	≥ -10
Max. permissible temperature [°C]	≤ +580

Selection as per pressure/temperature ratings (⇨ Page 6)

Valve body materials

Table 2: Overview of available materials

Material	Material number	Temperature limit
16 Mo 3	1.5415	≤ 530 °C
13 CrMo 4-5	1.7335	≤ 550 °C
10 CrMo 9-10/ 11 CrMo 9-10	1.7380/ 1.7383	≤ 580 °C

Design details

Design

- Straight-way Y-pattern valve
- Pressure seal design
- Forged body and cover
- Spring-loaded check disc
- Seat/disc interface made of wear-resistant and corrosion-proof Hastelloy

Variants

- Other butt weld end versions
- Other socket weld end versions
- Inspections to technical codes such as AD2000 or to customer specification
- Strainer
- Lift check valve with bolted cover, PN 250-500, DN 10-50, NORI 500 RXLR/RXSR, on request

Product benefits

- Robust design made of forged steel.
  - Extremely robust material with a very dense, homogenous and fine-grained microstructure enables the valve to withstand high stresses.
  - Ideal for very high pressures and temperatures.
- Economically efficient due to Y-pattern. Excellent zeta values and little pressure loss.
- Added safety due to pressure seal design providing safe sealing to atmosphere: The higher the pressure in the body, the tighter the bonnet joint. Very low risk of leakage, particularly at high pressures and temperatures. Compact design.
- Long service life and high functional reliability:
  - Hard-faced valve seat made of wear-resistant and corrosion-proof Hastelloy.
  - Closing spring made of stainless steel as a standard for variable installation positions.

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Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see https://www.ksb.com/en-global/company/corporate-responsibility/reach.

Product information as per Directive 2014/34/EU (ATEX)

The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zone 2+22) to ATEX 2014/34/EU.

Product information as per European Pressure Equipment Directive 2014/68/EU (PED)

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

Related documents

Table 3: Information/documents

Document	Reference number
Operating manual	0570.82

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Material
8. Fluid handled
9. Flow rate
10. Pipe connection
11. Variants
12. Reference number

Always indicate the original serial number and the year of construction when ordering spare parts.

Pressure/temperature ratings

Butt weld ends, machined (⇨ Table 8)

Table 4: Permissible operating pressure [bar][1]

PN	Material		[°C]																	
	Designation	Number	Up to 100	150	200	250	300	350	400	425	450	475	500	510	520	530	540	550	560[2]	570[2]	580[2]
250	16 Mo 3	1.5415	250,0	250,0	250,0	244,0	214,2	202,3	186,9	179,7	172,6	141,6	110,7	88,0	70,2	55,9	-	-	-	-	-
	13 CrMo 4-5	1.7335	250,0	250,0	250,0	250,0	250,0	238,0	225,0	217,8	210,7	185,2	163,0	138,0	111,9	92,8	72,6	58,3	-	-	-
	10 CrMo 9-10 / 11 CrMo 9-10	1.7380 / 1.7383	250,0	250,0	250,0	250,0	250,0	244,0	232,1	226,0	220,2	190,4	160,7	140,4	122,6	107,1	92,8	80,9	69,0	60,7	52,3

Butt weld ends, machined (⇨ Table 8)

Table 5: Permissible operating pressure [bar][1]

PN	Material		[°C]																	
	Material designation	Number	Up to 100	150	200	250	300	350	400	425	450	475	500	510	520	530	540	550	560[2]	570[2]	580[2]
320	16 Mo 3	1.5415	320,0	320,0	320,0	312,3	274,2	259,0	239,2	230,0	220,9	181,3	141,7	112,7	89,9	71,6	-	-	-	-	-
	13 CrMo 4-5	1.7335	320,0	320,0	320,0	320,0	320,0	304,7	288,0	278,8	269,7	237,1	208,7	176,7	143,2	118,8	92,9	74,6	-	-	-
	10 CrMo 9-10 / 11 CrMo 9-10	1.7380 / 1.7383	320,0	320,0	320,0	320,0	320,0	312,3	297,1	289,5	281,9	243,7	205,7	179,8	156,9	137,1	118,8	103,6	88,3	77,7	67,0

Butt weld ends, unmachined or machined to customer specifications

Table 6: Permissible operating pressure [bar][1]

PN	Material		[°C]																	
	Designation	Number	Up to 100	150	200	250	300	350	400	425	450	475	500	510	520	530	540	550	560[2]	570[2]	580[2]
400	16 Mo 3	1.5415	400,0	400,0	400,0	390,4	342,8	323,8	299,0	287,5	276,1	226,6	177,1	140,9	112,3	89,5	-	-	-	-	-
	13 CrMo 4-5	1.7335	400,0	400,0	400,0	400,0	400,0	380,9	360,0	348,5	337,1	296,3	260,9	220,9	179,0	148,5	116,1	93,3	-	-	-
	10 CrMo 9-10 / 11 CrMo 9-10	1.7380 / 1.7383	400,0	400,0	400,0	400,0	400,0	390,4	371,4	361,8	352,3	304,7	257,1	224,7	196,1	171,4	148,5	129,5	110,4	97,1	83,8

> PN 400: Higher operating pressure on request.

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1 The valves are suitable for temperatures down to -10 °C.
2 Only possible with bonnet, ring and segmental ring made of 1.4903

Materials

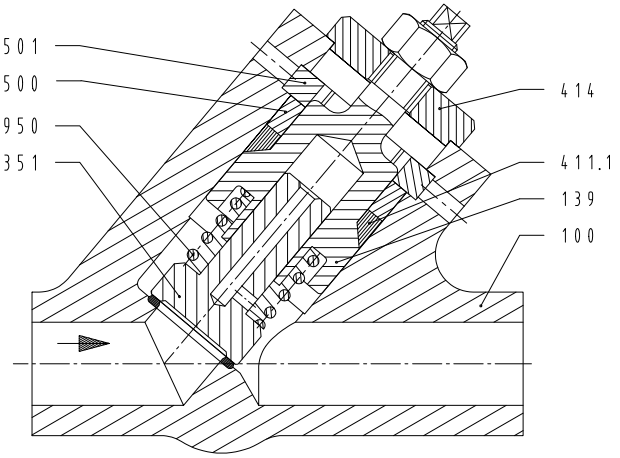
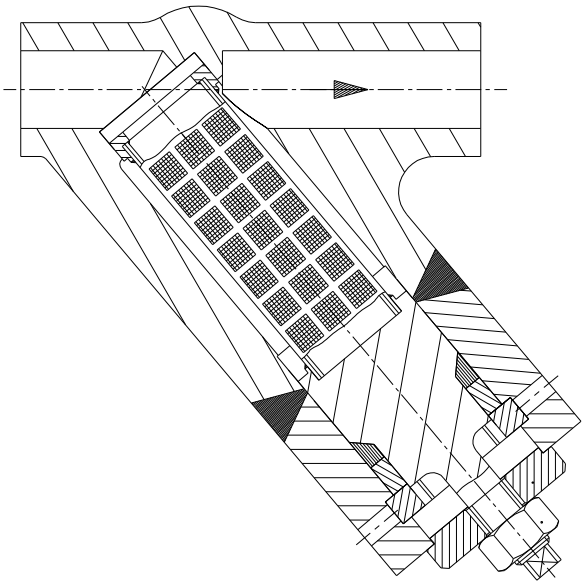


Fig. 1: Sectional drawings of RGS

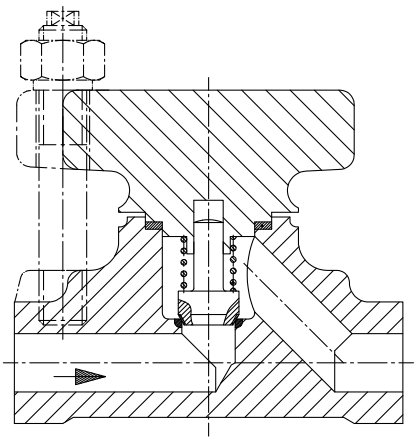
Table 7: Parts list

Part No.	Description	Temperature [°C]	Material	Material number	Note	Seat/disc interface
100	Body	≤ 530	16 Mo 3	1.5415	Die-forged	Hastelloy hard-faced
		≤ 550	13 CrMo 4-5	1.7335		
		≤ 580	10 CrMo 9-10/ 11 CrMo 9-10	1.7380/ 1.7383		
139	Bonnet	≤ 550	21 CrMo V 5-7	1.7709	-	-
		≤ 580	X 10 CrMoVNb 9-1	1.4903	-	-
351[3)]	Check disc	≤ 580	X 39 CrMo 17-1	1.4122	-	Solid
411.1[3)]	Joint ring	≤ 580	Graphite	-	-	-
414	Thrust plate	≤ 580	13 CrMo 4-5	1.7335	-	-
500	Ring	≤ 550	21 CrMo V 5-7	1.7709	-	-
		≤ 580	X 10 CrMoVNb 9-1	1.4903	-	-
501	Segmental ring	≤ 550	21 CrMo V 5-7	1.7709	-	-
		≤ 580	X 10 CrMoVNb 9-1	1.4903	-	-
950[3)]	Spring	≤ 580	Inconel	2.4669	-	-

Variants



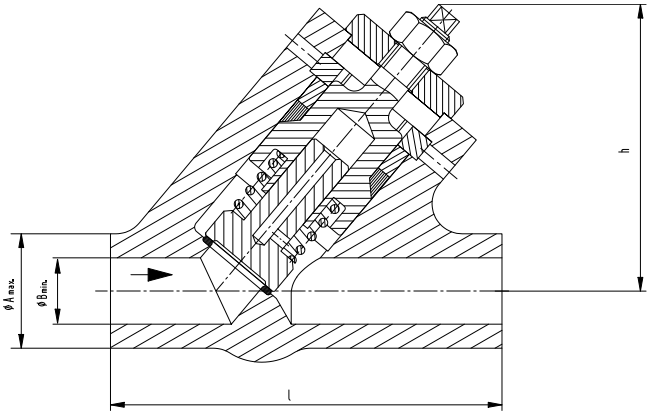
Strainer type FSS



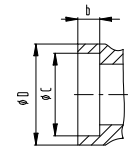
Lift check valve with bolted cover, PN 250-500, DN 10-50, NORI 500 RXLR/RXSR

3 Recommended spare parts

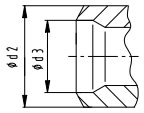
Dimensions and weights



Dimensions



Socket weld end
DN 20-50,
welded-on



Butt weld end

Table 8: Dimensions [mm] and weights [kg], RGS

PN	DN	l		Butt weld ends, unmachined		Butt weld ends to DIN EN 12627					Socket weld ends to DIN EN 12760 (PN 320)			h	[kg]
		Butt weld ends	Socket weld ends	ø $A_{max.}$	ø $B_{min.}$	ø d_2	ø d_3		Associated pipe dimensions		ø $D_{-0,5}$	ø $C^{+0,2}$	$b_{min.}$		
							PN 250	PN 320	PN 250	PN 320					
250 320 400	10	130	130	38	9	18	12,0	11,5	17,2 × 2,6	17,2 × 2,9	27,0	17,6	10,0	95	3,0
	15	130	130	38	14	22	16,0	15,0	21,3 × 2,6	21,3 × 3,2	32,5	21,8	10,0	95	3,0
	20	130	200	38	19	28	20,0	19,0	26,9 × 3,6	26,9 × 4,0	39,5	27,2	13,0	95	3,0
	25	130	200	38	22	35	26,5	24,0	33,7 × 3,6	33,7 × 5,0	48,0	33,9	13,0	95	3,5
250 320 400	32	160	240	58	30	44	34,0	30,5	42,4 × 4,5	42,4 × 6,3	57,0	42,7	13,0	125	6,5
	40	160	240	58	35	50	39,0	36,0	48,3 × 5,0	48,3 × 6,3	64,5	48,8	13,0	125	6,5
	50	210	290	80	46	62	48,0	47,0	60,3 × 6,3	60,3 × 7,1	83,0	61,2	16,0	145	9,0

Table 9: Dimensions [mm], RGS-FSS

PN	DN	Standard screen				Fine screen			
		Kv [m^3/h]	Zeta value	Mesh width	Wire diameter	Kv [m^3/h]	Zeta value	Mesh width	Wire diameter
250 320 400	10	2,8	2,0	1,25	0,63	2,3	2,9	0,28	0,22
	15	6,7	1,8	1,25	0,63	5,5	2,7	0,28	0,22
	20	12,2	1,7	1,25	0,63	9,9	2,6	0,28	0,22
	25	19,2	1,7	1,25	0,63	15,6	2,6	0,28	0,22
	32	31,7	1,7	1,25	0,63	25,6	2,6	0,28	0,22
	40	49,9	1,6	1,25	0,63	40,2	2,5	0,28	0,22
	50	78,0	1,6	1,25	0,63	62,9	2,5	0,28	0,22

Mating dimensions as per standard

Face-to-face lengths:	See table
Butt weld ends:	DIN EN 12627 Figure 2
Socket weld ends:	ASME B16.11, DIN EN 12760

Different designs of butt weld ends, socket weld ends and welding groove types are possible, but only within the dimensions $A_{max.}$ and $B_{min.}$.
Butt weld ends to DIN 3239-1 and/or socket weld ends to DIN 3239-2 are possible.

Installation instructions

Lift check valves must be installed in the line so as to ensure that the fluid enters the valve beneath the valve disc and flows out above the valve disc.

7692.1/20-EN

2025-07-31

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