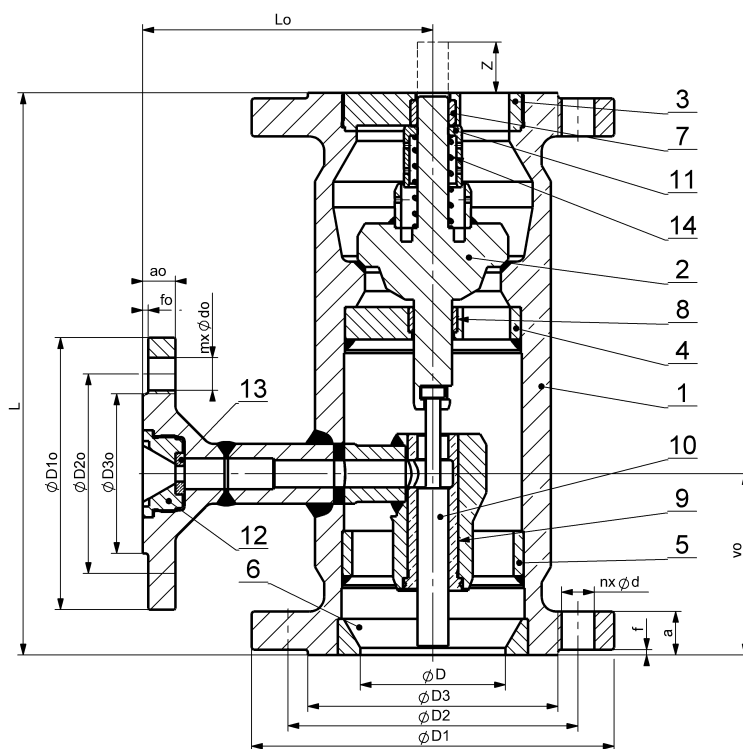


VERTICAL LIFT-TYPE CHECK VALVE WITH AUTOMATIC RELIEF, WITH A SPRING ON THE DISC

KM 9903.1 117P (Z40) FLANGED
 DN 50–400 PN 16–100



Materials

KM 9903.1 117 P-X		Material		
		Stainless steel	Alloyed steel	Carbon steel
Position	Component	X=0	X=3	X=4
1	Body	1.4541	1.5415 + seat facing 18/8 CrNi	S355J2 + seat facing 18/8 CrNi
2	Disc	DN < 125	1.4541 + seat facing Stellite 6	1.4541
		DN > 125	1.4541 + seat facing Stellite 6	1.5415 + seat facing 18/8 CrNi
3	Outlet guide	1.4541	1.5415	S355J2
4	Guide	1.4541	1.5415	S355J2
5	Guide of piston	1.4541	1.5415	S355J2
6	Ring	1.4541	1.5415	S355J2
7	Slide bearing	1.4462	1.4034	1.4034
8	Slide bearing	1.4462	1.4034	1.4034
9	Bush of piston	Bronze	Bronze	Bronze
10	Piston	1.4541	1.4541	1.4021, ČSN 17 027
11	Travel stop	1.4021, ČSN 17 027	1.4021, ČSN 17 027	1.4021, ČSN 17 027
12	Insert	1.4021, ČSN 17 027	1.4021, ČSN 17 027	1.4021, ČSN 17 027
13	Orifice plate	Stellite 6	Stellite 6	Stellite 6
14	Spring	1.4310	1.4310	1.4310

Dimensions

PN 16, 25 PN 40	DN	ØD1	ØD2	ØD3	f	a	n	Ød	L	Lo	Vo	Z~
	50	165	125	102	3	20	4	18	230	130	80	24
	65	185	145	122	3	22	8	18	290	150	90	27.5
	80	200	160	138	3	24	8	18	310	160	100	28
PN 16	DN	ØD1	ØD2	ØD3	f	a	n	Ød	L	Lo	Vo	Z~
	100	220	180	158	3	20	8	18	350	200	110	34
	125	250	210	188	3	22	8	18	400	210	130	47
	150	285	240	212	3	22	8	22	480	260	150	46
	200	340	295	268	3	24	12	22	600	310	165	*
	250	405	355	320	3	26	12	26	730	340	190	85.5
	300	460	410	378	4	28	12	26	850			*
	350	520	470	438	4	30	16	26	980			*
PN 25, 40	DN	ØD1	ØD2	ØD3	f	a	n	Ød	L	Lo	Vo	Z~
	100	235	190	162	3	24	8	22	350	200	110	37
	125	270	220	188	3	26	8	26	400	210	130	45
	150	300	250	218	3	28	8	26	480	260	150	46
PN 25	DN	ØD1	ØD2	ØD3	f	a	n	Ød	L	Lo	Vo	Z~
	200	360	310	278	3	30	12	26	600	310	165	*
	250	425	370	335	3	32	12	30	730	340	165	*
	300	485	430	395	4	34	16	30	850			*
	350	555	490	450	4	38	16	33	980			*
PN 40	DN	ØD1	ØD2	ØD3	f	a	n	Ød	L	Lo	Vo	Z~
	200	375	320	285	3	34	12	30	600	310	165	*
	250	450	385	345	3	38	12	33	730	340	165	*
	300	515	450	410	4	42	16	33	850			*
	350	580	510	465	4	46	16	36	980			*
PN 63	DN	ØD1	ØD2	ØD3	f	a	n	Ød	L	Lo	Vo	Z~
	50	180	135	102	3	26	4	22	300			*
	65	205	160	122	3	26	8	22	340	193	110	27.5
	80	215	170	138	3	28	8	22	380	203	120	*
	100	250	200	162	3	30	8	26	430	218	170	28
	125	295	240	188	3	34	8	30	500			*
	150	345	280	218	3	36	8	33	550	233	190	46.5
	200	415	345	285	3	42	12	36	650	308	205	*
	250	470	400	345	3	46	12	36	775			*
	300	530	460	410	4	52	16	36	900			*
	350	600	525	465	4	56	16	39	1025			*
400	670	585	535	4	60	16	42	1150			*	

* = contact our office.

Dimensions

	DN	ØD1	ØD2	ØD3	f	a	n	Ød	L	Lo	Vo	Z~
PN 100	50	195	145	102	3	30	4	26	300			*
	65	220	170	122	3	34	8	26	340	193	110	27.5
	80	230	180	138	3	36	8	26	380	203	120	28
	100	265	210	162	3	40	8	30	430	218	155	34
	125	315	250	188	3	40	8	33	500	228	165	46
	150	355	290	218	3	44	12	33	550	233	190	*
	200	430	360	285	3	52	12	36	650	308	205	*
	250	505	430	345	3	60	12	39	775			*
	300	585	500	410	4	68	16	42	900			*
	350	655	560	465	4	74	16	48	1025			*
	400	715	620	535	4	78	16	48	1150			*

* = contact our office.

Application

Flanged vertical lift-type check valve with automatic relief type KM 9903.1 117 (Z40) is designed to ensure safety of service, i.e. to protect pump against reverse flow of the pumped fluid and to safe start-up and termination of operation of the pump. The valve is not designed for long-term fluid flow through the bypass when the bypass channel is opened.

The check valve for vertical pipeline is an unidirectional valve and the direction of the fluid flow is marked with an arrow on the valve's body from the bottom to the top, i. e. under the disc. In case the fluid starts flowing back, the disc closes the check valve automatically. Movement of the disc is linked with movement of the piston of automatic relief which opens the flow to the bypass. The bypass is connected to a pipe which mouths into the pump tank. In this way the pump can terminate its operation with a minimum quantity of the fluid in order to protect it against damage by overloading. Closing or opening of the bypass channel is not mechanically regulated. Operation of the valve with opened bypass channel is accompanied by increased noise. When the valve is opened then the bypass channel is closed by a piston which is loose in its bush therefore it is not possible to ensure 100% tightness of the inlet of the bypass channel.

Vertical lift-type check valves are neither designed as conventional isolating valves nor regulating valves. If permanent tightness of the disc or bypass is required, an isolating valve shall be installed into the delivery piping or bypass piping. The service fluid must contain no mechanical impurities in form of grains or powders and its chemical composition must not form segregation deposits on the piston and the piston guide bearings. The same applies to impurities in the piping system during installations, repairs or replacements.

The check valves are designed to be used with fluids in group 2 (non-corrosive fluids with the exception of potable water) according to Decree of the Government No. 26/2003 and Pressure Equipment Directive 97/23/EC, but it is recommended to use this valve for demineralized water only. The resistance of the check valve to the fluid and its temperature is limited by the chemical composition of the check valve materials. It is therefore recommended to consult the suitability for the relevant fluid with the manufacturer. Allowable service pressures are in compliance with the pressure-temperature ratings.

Technical description

The main part of the flanged vertical lift-type check valve with automatic relief is a one-piece body which is made of rolled or forged steel. The body contains an inlet disc guide and an outlet disc guide with plain bearings and a piston guide with bronze bushing which are pressed into the body. The pressed-in parts are secured by centre punching or welds. The disc guides are secured in place by the counter-flanges of the piping. The seats of both the body and the disc are usually weld-deposited with austenitic steel of 18/8 CrNi type or Stellite 6 – type of the weld overlay depends on the material composition of the check valve. The disc is lapped with the body seat.

The disc closes by self-weight and, in addition to it, is pressed into the seat by a compression spring made of a high-quality material. The piston, which is linked to the spindle of the disc, moves with the disc and automatically opens or closes the fluid flow to the bypass. The pressure drop on the bypass channel is reduced on a single orifice plate or a set of orifice plates. It is recommended to the user to install a horizontal pipeline behind the flange of the bypass with its length at least 5 times of the nominal diameter of the bypass pipeline, to soothe the turbulent flow of the fluid.

The design of the valve is suitable for pressures up to PN 100 and for a maximum volume flow rate through the bypass channel of about 20 % of the allowed volume flow rate through the check valve.

Connection to piping

Overall dimensions are shown in the tables of dimensions.

- connection according to EN 1092-1
- face-to-face dimensions in pressure classes PN 16, 25, 40 – Series 1 according to EN 558-1
- face-to-face dimensions in pressure classes PN 63, 100 – Series 2 according to EN 558-1

Testing

According to EN 12 266-1 as a standard, i.e. shell strength test P10, P11, seat tightness test P12 (water pressure $1,1 \times PN$ and air pressure 0,6 MPa), leakage rate A – zero leakage, operability test F20. Standard ČSN EN 13709 specifies that a seat leakage corresponding to leakage rate C according to ČSN EN 12266-1 is allowed in case of test P12. If required by the Customer, additional tests may be performed as well.

Installation, service and maintenance

Vertical lift-type check valve shall be installed in vertical position. As it is a uni-directional valve, the fluid flow shall correspond to the arrow marked on the valve body. When installing the vertical lift-type check valve to piping it should be taken into account the fact that that in the fully open position of the valve the shaft of cone protrudes above the outlet flange by a distance which is equal to the maximum cone lift.

If the values of temperature and pressure of the fluid and quantity of the fluid flowing through the branch piece as specified on the valve label are adhered to, the check valve operation is fully automatic.

When the service fluid does not meet the requirements regarding the purity, the operator must ensure regular cleaning of the piston and of the bronze piston guide otherwise the piston gets blocked. Cleaning interval depends on the specific operating conditions, however, it is recommended to clean the piston guide every 2 months.