steam & condensate management
solutions

Check valves overview

First for Steam Solutions

spirax sarco

EXPERTISE | SOLUTIONS | SUSTAINABILITY

Reverse flow protection

Spirax Sarco offers a comprehensive range of check valves designed to protect equipment that can be affected by reverse flow.

An awareness of the problems associated with reverse flow and related pressure surges is essential, particularly when using flowmeters, as reverse flow reduces accuracy. Reverse flow can also cause problems in manufacturing processes affecting product quality.

There are a number of reasons for using check valves, which include:

- Protection of any item of equipment that can be affected by reverse flow, such as flowmeters and control valves
- Prevention of unwanted pressure surges associated with hydraulic forces, for example waterhammer
- Prevention of flooding which may occur under gravity or on system shutdown
- Relief of vacuum conditions
- Reduced risk of cross contamination in processes.

Our check valves can be used across a wide range of industries including:

- Oil and petrochemical
- Pharmaceuticals
- Shipbuilding
- Power generation
- Institutions
- Food and beverage production
- Pulp and paper
- Textiles.

Typical applications include:

- Steam and condensate lines
- Process lines
- Hot and cold water systems
- Heating systems
- Thermal oil systems.

Our check valves are available in a comprehensive range of designs, materials and sizes to suit a wide variety of applications and processes. With our expertise in steam systems and other related industrial fluids we are always on-hand to help you select the best solutions for your requirements.

Disc check valve

Designed to fit between two pipeline flanges, the Spirax Sarco DCV provides a compact installation when compared size-for-size with conventional lift type check valves. The DCV is available in a wide range of materials and suitable for use across a variety of processes and industries.

For applications which require heavy or pulsating flows, such as after a pump installation, the DCV10 is available. The 'centrally guided' design of the DCV10 offers improved reliability when compared to traditional unguided disc check valves.

DCV41

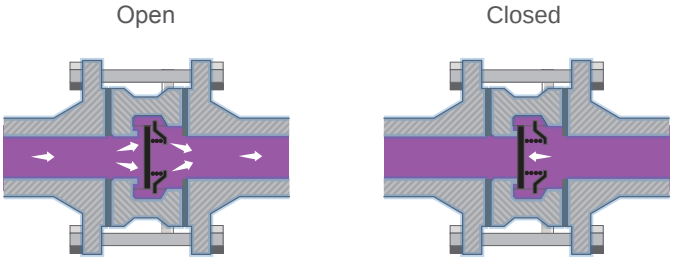
DCV4

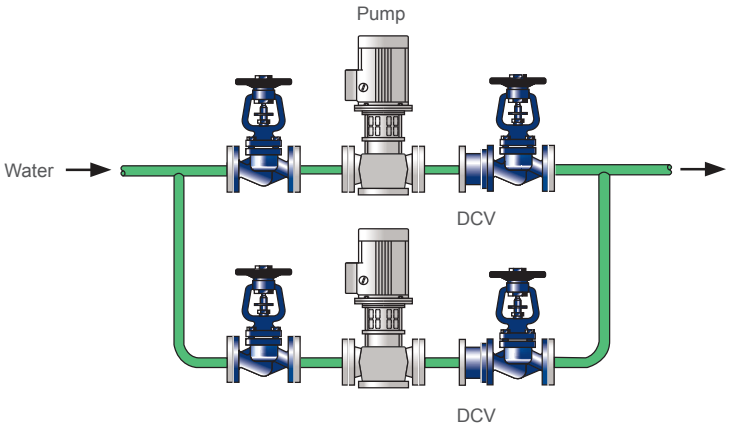
DCV10

For full range see pages 10-11

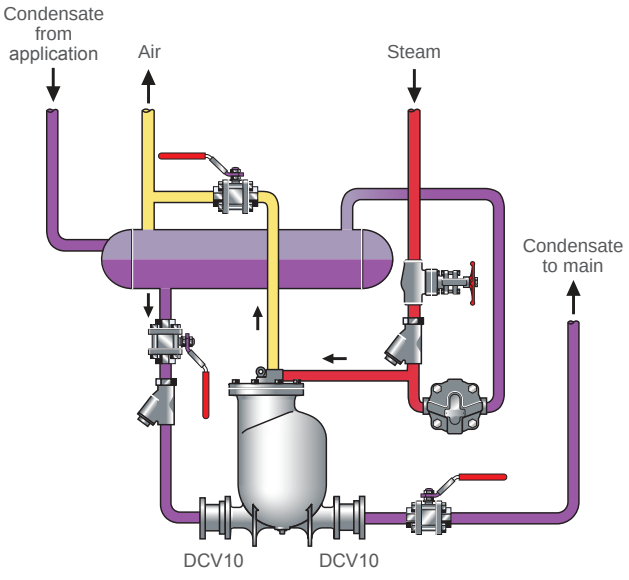
How the disc check valve works

The valve is opened by the flow pressure of the fluid, and closed by the spring when flow ceases and before reverse flow can occur.





Typical bypass application



Typical mechanical pump-trap application

Split disc check valve

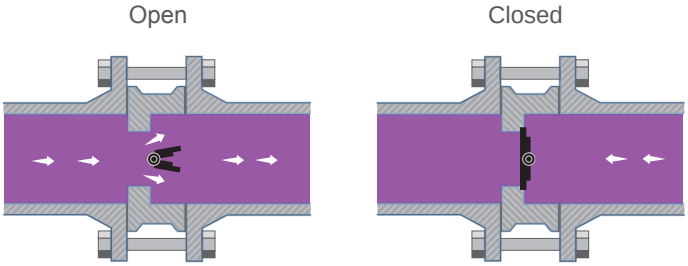
Like the DCV, the Spirax Sarco SDCV provides a compact installation. The design of the SDCV resolves the size and pressure drop limitations of other check valve types. The split disc design is not limited in size which means it can be produced in much larger sizes than other disc check valve types.

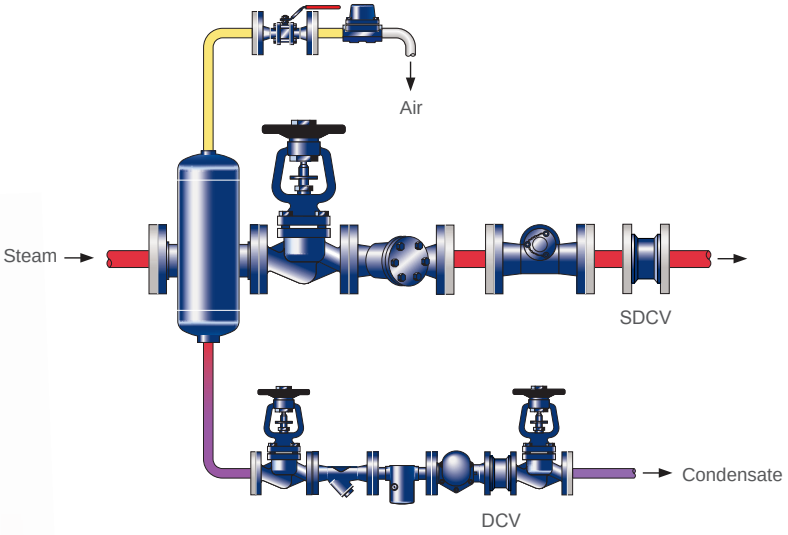
SDCV8

For full range see pages 10-11

How the split disc valve works

The valve is opened by the flow pressure of the fluid, and closed by the spring when flow ceases and before reverse flow can occur.





Typical application showing condensate removal from steam main

Swing-type wafer check valve

The swing-type wafer check valve (WCV), has the most compact and light-weight design of all the check valve types making it ideal for use in larger pipeline sizes, typically above DN125, with reduced requirement for additional support to pipelines.

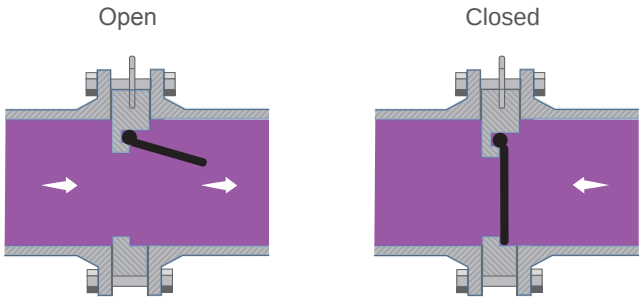
Its unobstructed flow-path design ensures the WCV can be used in applications where fluids carry solid elements such as sludge and pulp.

WCV2

For full range see pages 10-11

How the swing-type wafer check valve works

The wafer check valve is opened by the flow pressure of the fluid forcing the disc to hinge upwards allowing flow through the valve. Reverse flow will cause the disc to shut against the seat. In the absence of flow the weight of the disc forces closure of the valve.



Lift check valve

The Spirax Sarco LCV range offers robust solutions for prevention of reverse flow with options for use in horizontal and vertical pipelines. With only a single moving part the LCV design is virtually maintenance free. The majority of the valves within the LCV range also offer a replaceable seat arrangement for simple and quick maintenance. This range is also ideal for low differential pressure applications.

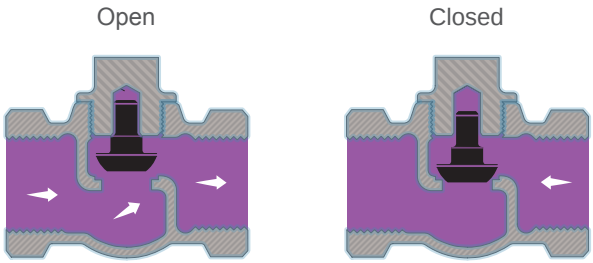
LCV1

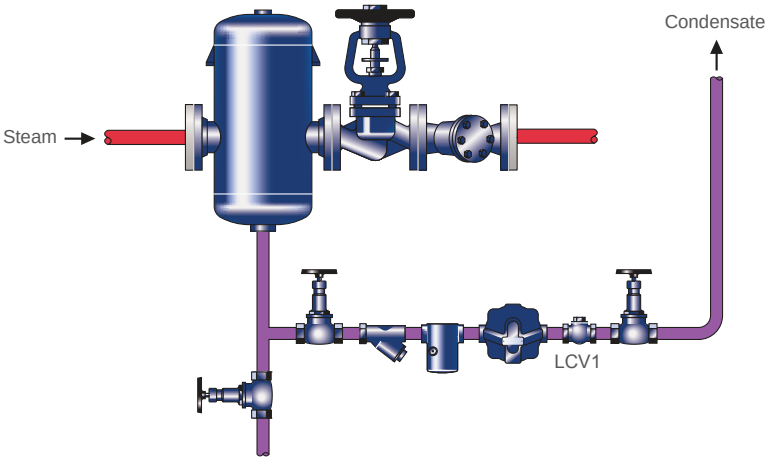
LCV4

For full range see pages 10-11

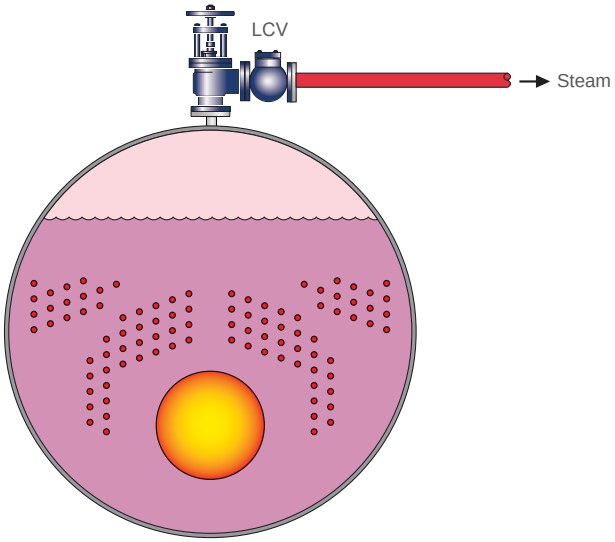
How the lift check valve works

The flow of fluid into the valve lifts the cone off its seat, exposing the outlet and allowing fluid to pass through. The cone returns to its seat when the flow ceases.





Typical application showing an LCV1 as part of a trap set



Typical application showing an LCV4 installation on a steam boiler

Sanitary check valve

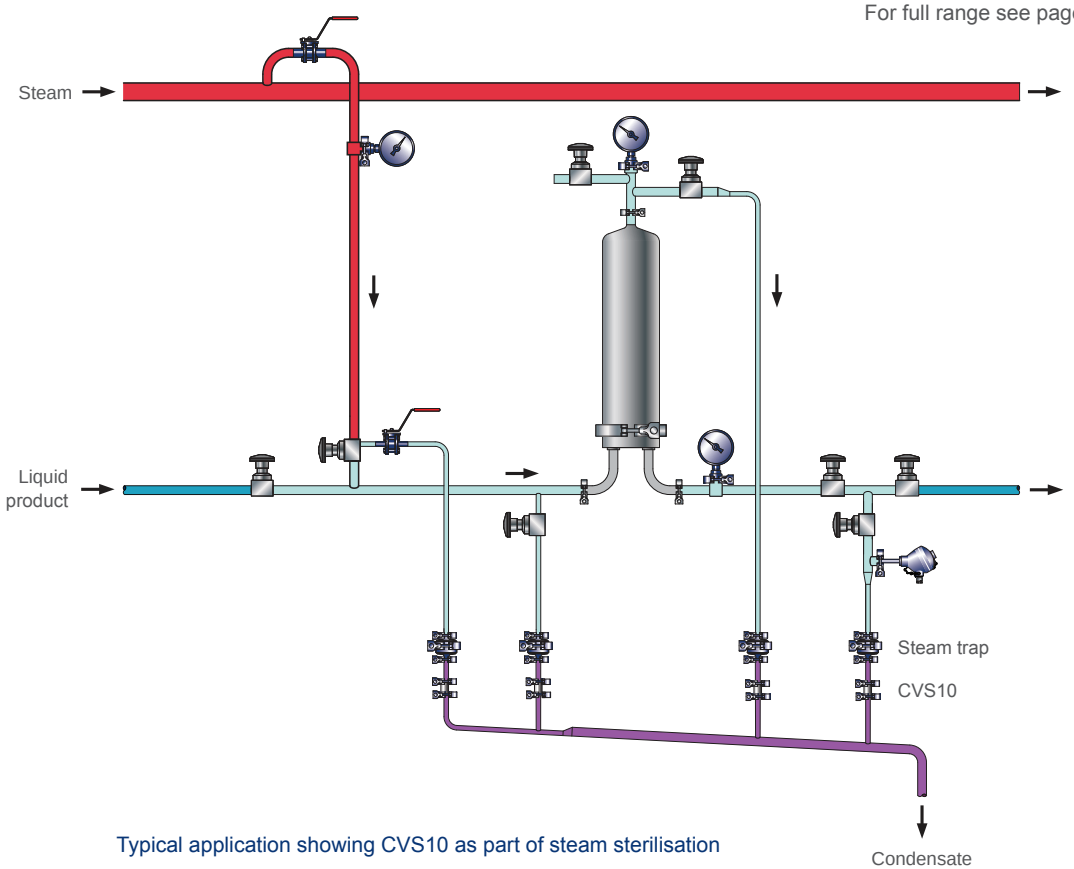
The CVS10 sanitary check valve has been designed specifically for use in the pharmaceutical industry for the prevention of reverse flow and cross contamination and is manufactured to the latest version of ASME BPE.

- Available with metal seat for clean and pure steam/condensate applications or with soft seat for high purity fluid applications such as WFI (Water For Injection) systems
- All elastomers are compliant with the applicable FDA CFR 21 para 177 and USP class VI standards
- Full traceability of wetted materials throughout
- Choice of surface finish to maintain sterility and reduce risk of microbial growth
- Part of a dedicated high purity product range from Spirax Sarco.

CVS10 with soft seat for high purity fluid applications

CVS10 with metal seat for clean and pure steam/condensate applications

For full range see pages 10-11



Typical application showing CVS10 as part of steam sterilisation

Type of check valve			Disc								
Material			Bronze	Stainless steel							
Model			DCV1	DCV3	DCV3/B	DCV4	DCV6	DCV8	DCV10	DCV10C*	DCV41
Body design rating			PN16	PN40	PN40	ASME 300	PN40 or ASME 300	PN40	PN25 or PN40	PN40 or ASME 300	PN50
Size	DN15	½"	•	•		•	•	•			
	DN20	¾"	•	•	•	•	•	•			•
	DN25	1"	•	•	•	•	•	•	•		•
	DN32	1¼"	•	•	•		•	•	•		•
	DN40	1½"	•	•	•	•	•	•	•		
	DN50	2"	•	•		•	•	•	•		
	DN65	2½"	•	•			•	•	•		
	DN80	3"	•	•		•	•	•	•		
	DN100	4"	•	•		•	•	•	•		
	DN125	5"							•	•	
	DN150	6"							•	•	
	DN200	8"							•	•	
	DN250	10"							•	•	
	DN300	12"									
	DN350	14"									
	DN400	16"									
	DN450	18"									
	DN500	20"									
Pipeline connections	Screwed										•
	Socket weld										•
	Flanged	EN	•	•	•		•	•	•	•	
		ASME				•	•		•	•	
		JIS/KS	•	•			•		•	•	
		BS 10	•	•	•		•				
	Sanitary clamp										
Seat options	Metal-to-metal		•			•	•	•	•	•	•
	EPDM		•		•	•	•	•			•
	Fluoroelastomer (Viton)		•			•	•	•			•
	PTFE										
	FEP-Silicone										
	NBR										
Spring options	Without spring		•	•		•	•	•			•
	Standard		•	•		•	•	•	•	•	•
	Heavy duty		•	•	•		•	•			•
	High temperature			•		•	•	•			•

*** DCV10C features carbon steel body with stainless steel disc and seat.**

Split disc				Swing		Lift					Sanitary
Carbon steel		Stainless steel		Bronze	Stainless steel	Bronze	Cast iron	Carbon steel	Stainless steel	SG iron	Stainless steel
SDCV3	**SDCV7**	**SDCV4**	**SDCV8**	**WCV1**	**WCV2 / WCV3**	**LCV1**	**LCV3**	**LCV4**	**LCV6**	**LCV7**	**CVS10**
ASME 300	PN40	ASME 300	PN40	PN16	PN40	PN16	PN16	PN40	PN40	PN25	PN10
						•	•	•	•	•	•
						•	•	•	•	•	•
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The check valves featured in this brochure form part of a wide range of products and services available from Spirax Sarco. We offer expert advice and sustainable steam solutions to many industries and applications and in all areas of the steam and condensate process. For more information about our check valves or any of our solutions and services, please visit www.spiraxsarco.com.

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