

C15

Axial Non-Slam Silent Check Valve

Product Description

DENZ-C15 Axial Silent Check Valve, is one of the main and most common check valve, which reduces or eliminates water hammer and its effects. There is a great deal of risk associated with pipelines due to water hammer and the most preferred solution is using the axial check valves. Alternatively, axial check valves are called non-slam check valves.

At other types of check valves, the discs might close quickly when the pump shuts down. When a pipe system abruptly stops flowing, water hammer occurs as high-pressure shock waves. The reversal of flow caused by water hammer places severe stress on the pipe, endangering its structural integrity and exposing it to potential rupture. Some of the most common causes of water hammer are swing check valves, tilting disc check valves, and double plate check valves. Various other non-return valve designs rely on external devices like counterweights and slam retarders to operate satisfactorily. Those do not allow buried installation, are space consuming and require regular maintenance. DENZ Axial Check Valve can be buried or installed in locations where space or weight is at a premium. DENZ Axial Flow Check Valve normally does not require maintenance.

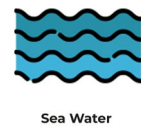
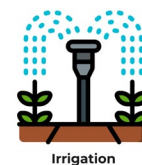
Application Areas

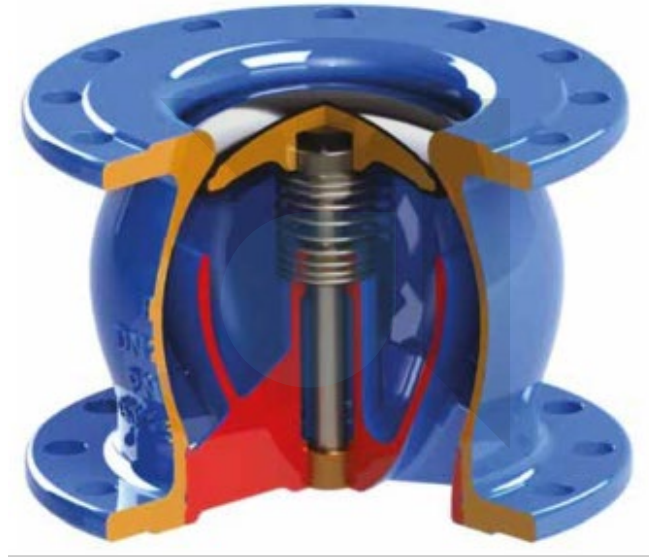
- Transmission pipeline
- Compressor discharge
- Water treatment plants
- Desalination plants
- Pumping stations
- Subsea pump and flowline applications
- Hydropower installations
- Potable water systems



Production References

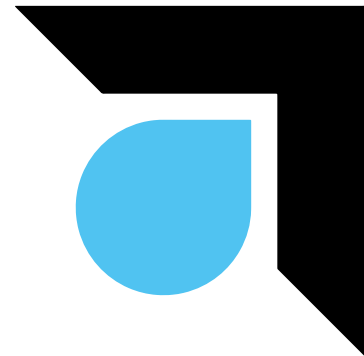
Size Range	DN50 - DN1000
Pressure Range	PN10/16/25/40
Temperature	EPDM: +80°C NBR: 60°C VITON: 120°C
Face to face	EN558 Series 8 / ISO 5752-8
Design	EN12334
Connection	Flanged - EN1092-2
Coating	Electrostatic Powder Epoxy
Testing	EN 12266-1
Marking	EN 19





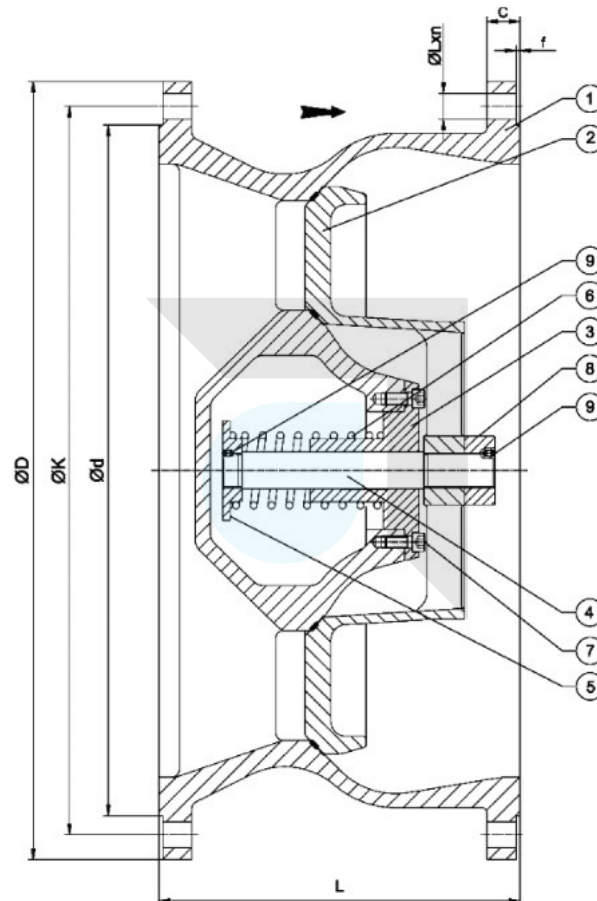
2 Product Features

- ENGJS500-7 Ductile iron body and bonnet for high strength and impact resistance.
- In addition to reducing turbulence, the full-port expanded body also prevents erosion and vibration. There is no downtime or maintenance cost associated with the process.
- A venturi-shaped body with a full flow passage and high pressure recovery results in very low pressure loss. Reduced pump and compressor operating costs are a result of this advantage..
- Bronze bushings, easy-to-replace parts, and easy-to-clean surfaces.
- As a result of a special design spring, DENZ Axial Check Valves are able to close efficiently
- In order to minimize the head loss in the check valve, the DENZ Axial Check Valve body is designed like a globe, and it can be installed in any position, either flow up or flow down.
- Low static pressure in the throat area creates a pressure differential over the disc, resulting in easy opening.
- The hydrodynamic design ensures that there is no slamming or water hammering.
- When the valve is in operation, the stainless steel spring is hidden underneath protection in the diffuser.
- 100% of the valves are subjected to Hydrostatic tests according to EN 12266-1. Pressure for seat: PN x 1.1 , for shell: PN x 1.5





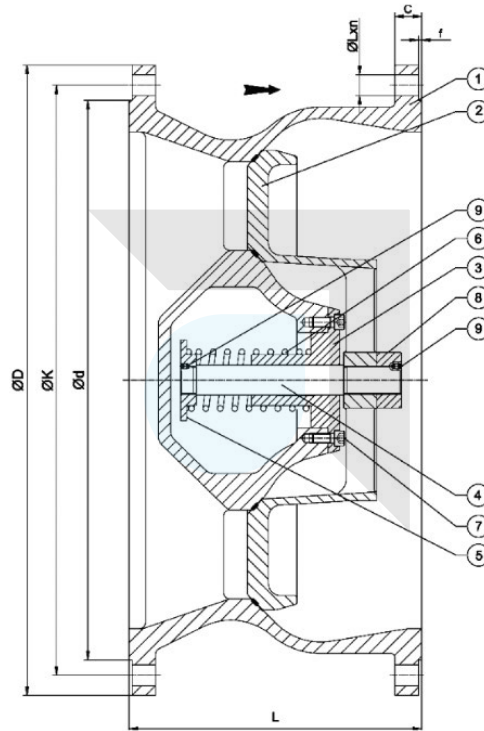
Material List <<<<



#	Part	Material
1	Body	Ductile Iron EN-GJS-400/500 (GGG40/50)
2	Disc	Steel / Ductile Iron
3	Sealing	EPDM
4	Shaft	Stainless Steel AISI 420 / 304 / 316
5	Shaft Cover	Stainless Steel AISI 304 / 316
6	Spring	Stainless Steel AISI 304 / 316
7	Disc Bolt	Stainless Steel A2 / A4
8	Stem Centering Part	Ductile Iron EN-GJS-400/500 (GGG40/50)
9	Stem Bushing	Bronze / MS58 Brass

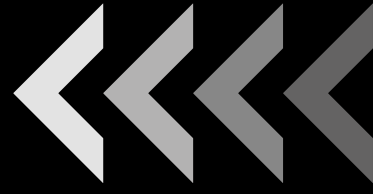


Dimensions



DN	ØD	ØK	Ød	C	f	Ølxn	L
100	220	180	156	19	3	19x8	175
125	250	210	184	19	3	19x8	200
150	285	240	211	19	3	23x8	225
200	340	295	266	20	3	23x8	275
250	405	350	319	22	4	23x12	325
300	460	400	370	24.5	4	23x12	375
350	520	460	429	26.5	4	23x16	425
400	580	515	480	28	4	28x16	475
450	640	565	530	30	4	28x20	500
500	670	620	582	36.5	4	28x20	550
600	840	725	682	42	5	31x20	600
700	910	840	794	39.5	5	31x24	650
800	1025	950	901	43	5	34x24	700
900	1125	1050	1000	54	5	34x28	800
1000	1255	1160	1112	50	5	37x28	900

Units: mm / indicative dimensions & weights



What is a Axial Check Valve? <<<<

DENZ C15 Axial Check Valve is a valve used to prevent reverse fluid flow. Also, this valve helps to prevent water hammer problems and its related effects. A water hammer is a shock wave of high pressure that occurs when fluid flow is stopped abruptly due to either the valve disc closing or the pump shutting down. Water hammer is dangerous because it causes high stress on the piping system which could cause structural damage to the piping system. As such, silent check valve manufacturers design these valves to help in eliminating water hammer problems. When the pump is shut off or when fluid pressure reduces, the valve has a spring action that helps to control disc closure before fluid reverses. This design helps to ensure that the valve does not slam shut and thus eliminates the water hammer and reverse fluid flow.

Body

This is the part of a silent check valve used to house all the internal parts. The body is usually made very strong since it serves as the main pressure barrier as well as protecting internal parts against impact damage. To make sure the body is strong, silent check valve manufacturers use strong metallic materials to make the body. Such materials include stainless steel, carbon steel, ductile iron, and cast iron, among other metallic materials. The valve body also contains the valve ports where the fluid flows through the valve while coming from the pipe. The body also contains threads or holes for connecting it to the pipe using screws or bolts and nuts.

Disc

This is part of DENZ-C15 Axial Silent Check Valve that is tasked with opening and closing the fluid flow depending on the pressure level.

Spring

A spring is used to help in returning the disc to the seating position after the flowing fluid pressure reduces. The spring employs its compressive properties to help the disc open fluid flow.

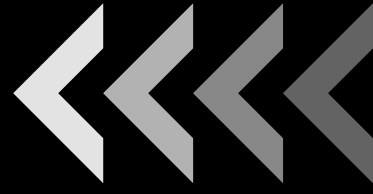
Seat

This is a component inside the body of a silent check valve that comes into contact with the valve disc as it tries to restrict fluid flow. The seat serves as a seal to prevent fluid leakage between the disc and the valve body.

Gasket

This is a component of a silent check valve that is placed between the valve and the pipe to prevent fluid leakage through the connection. The gasket is held in place by the pressure created when the valve and pipe are connected using screws or bolts. There are different types of gaskets used in silent check valves which include steel, durometers, and elastomers.





How does DENZ Axial Silent Check Valve work? <<<<

DENZ Axial Silent Check Valve works based on the principle of differential pressure. In this case, the valve opens if the upstream pressure is more than the downstream pressure. The valve closes when the downstream pressure is more than the upstream pressure. So, for a silent check valve to open, the suction pressure is high enough to provide pressure energy. The pressure energy of the flowing fluid provides the force used to compress the valve spring.

Compressing the valve spring forces the valve disc to open allowing fluid flow. The fluid keeps flowing while the valve is open and the pressure remains high. When the pressure reduces the valve spring uses its potential energy to revert to its length and in that instance, it forces the valve disc to close. For DENZ Axial Silent Check Valve, the fluid flow starts closing immediately after suction pressure starts reducing. As such, the valve starts closing slowly which helps to eliminate the water hammer problem.

DENZ Axial Silent Check Valves do not rely on gravitational force to close like lift check valves. The opening of this valve depends on the suction pressure level from the pump while closing the valve depends on compressive strength and thus potential energy associated with the compressed spring. As such, a silent check valve can be installed in vertical or horizontal direction as either orientation will not affect its working principle.

Troubleshooting <<<<

The valve vibrates or chatters

The fluid is moving at high velocity. Ensure the flow rate is as recommended by the silent check valve manufacturer.

Valve Leaking Fluid

Foreign materials are clogging the valve. Open the valve and remove any foreign materials.

The valve seat is damaged. Replace the valve seat.

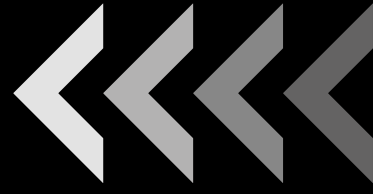
The valve gasket is worn out or damaged. Replace the gasket.

Loose connection between the valve and the pipe. Tighten the connecting elements that are bolts and nuts or screws to the torque recommended by the silent check valve manufacturer.

No Fluid Flows Through The Silent Check Valve

The valve was installed in the wrong direction. Reinstall the valve according to the flow direction indicated by the silent check valve manufacturer.





Key Differences Between Axial and Swing Check Valves



Some styles of check valves are specifically designed to allow their disc, or flapper, to slam shut in certain conditions, such as the reversal of fluid flow. This sudden shutting, or slamming, creates a wave of pressure in the liquid that reverberates throughout the system and, depending on the precise application, can ultimately lead to reduced process efficiency, valve damage, gasketed joint leaks and other issues. This inevitable — but controllable — phenomenon is commonly referred to as water hammer.

DENZ Axial Check Valves are designed specifically for use in these situations. As their name implies, these valves close without slamming, meaning no excess pressure spikes are created. The disc of a DENZ Axial Check Valve has an internal spring opposing the opening fluid flow pressure. When the flow of a media is strong enough, the spring compresses and the valve opens; the disc is smoothly pushed back toward the seating surface in the valve by the spring as the flow decreases and stops, but before flow direction reverses.

Often called flapper style check valves, swing check valves are a more traditional variety. The disc of a swing check valve is secured to the body of the valve by a trunnion and hinge arm, without the aid of a spring. Unlike an axial check valve, which opens and closes at rates comparable to the pressure of the fluid flow, a swing check valve opens and closes more suddenly, relying on the installation orientation, gravity, and reversing flow to close the valve.

Both axial check valves and swing check valves are suitable for use in a wide range of applications. Generally, though, axial check valves are ideal for vertical runs of piping, or complex applications that require constant and controllable pressure levels. Alternatively, swing valves are often used in very large-volume applications, horizontal pipe runs, and those applications in which varying pressures and flow rates are not a concern.

DENZ axial check valves are also used in similar applications throughout the chemical processing industry, steam condensate systems, and in the power generation industry.

Swing valves, because of their less controlled opening and closing mechanics, are used in less sensitive applications. They are most commonly employed in large-scale pipeline applications, such as liquid, gas, and steam, generally only in horizontal configurations. In particular, they're often used in natural gas applications, as natural gas processing generally does not require as stringent pressure control as the oil and refining industry or in sewage and water treatment systems.

