



A Wide Selection of Specialty
Check Valves



**Built to Meet
Critical Requirements**

ADAMS





Product development and manufacturing strictly follow the company's philosophy of

- uncompromising quality
- robust, well-proven designs
- innovative engineering
- long-term corporate commitment to quality



The purpose of check valves or non-return valves is to allow fluid flow in one preferred direction and to prevent backflow, or flow in the opposite direction. As pressure drops in a pipe and the fluid momentum slows, a check valve ideally begins to close. As the flow direction reverses, the check valve closes completely. Based on this simple operation, it appears that a single check valve design would be sufficient for use in any application. In addition to this basic non-return function, however, there are other service requirements which must be met by a check valve design which can vary extensively with different applications.

The ADAMS range of check valves is probably the most comprehensive and sophisticated product line produced by any manufacturer. Types available range from gravity closing, fast-acting tilting disc valves to ultra fast-closing, power assisted check valves for high pressure, high temperature applications and ultimately to hydraulically damped, combined function check valves for severe pump applications. Our line of check valves range in sizes from 100 mm / 4 in. to 3000 mm / 120 in.; pressure classes from PN 2.5 to PN 250 (ANSI 150 to 1500); and temperatures from -196° C / -320° F to +950° C / +1740° F, depending on the type of valve.

The majority of our check valve designs are furnished with the exclusive ADAMS inclined conical seal system. This sealing system, utilized to seat the disc properly in the closed position, has been used in thousands of valves, since the 1960's. During our history we have continually improved and developed our patented seat technology to the forefront of valve technology. This sealing system provides tight shut-off over a wide range of service temperatures, freedom from jamming, and low trim inertia for faster valve response to flow changes.

The present ADAMS range of check valves represents the result of our years of experience with manufacturing, development and testing of check valves for a wide range of applications. Results of ongoing development and extensive testing will be used for continuous improvement of the current check valve designs to maintain our position of leading check valve technology.

CONTENTS

Selection diagram Page 5

Liquid or gas and steam flow Page 6

LIQUIDS

Damper controlled closing or uncontrolled closing Page 6

Multirate adjustable damping system Free-acting or positive valve action Page 7

Type GZA Page 8

Type RZN Page 9

Type RZI Page 10

No flow control capability or flow control capability Page 11

Type GBZ (combined function valve) Page 12

Type AZI (combined function valve) Page 13

GASES, STEAM

Gravity closing or assisted closing Page 14

Type GMZ Page 15

Type SCV Page 16

Type FCV Page 17

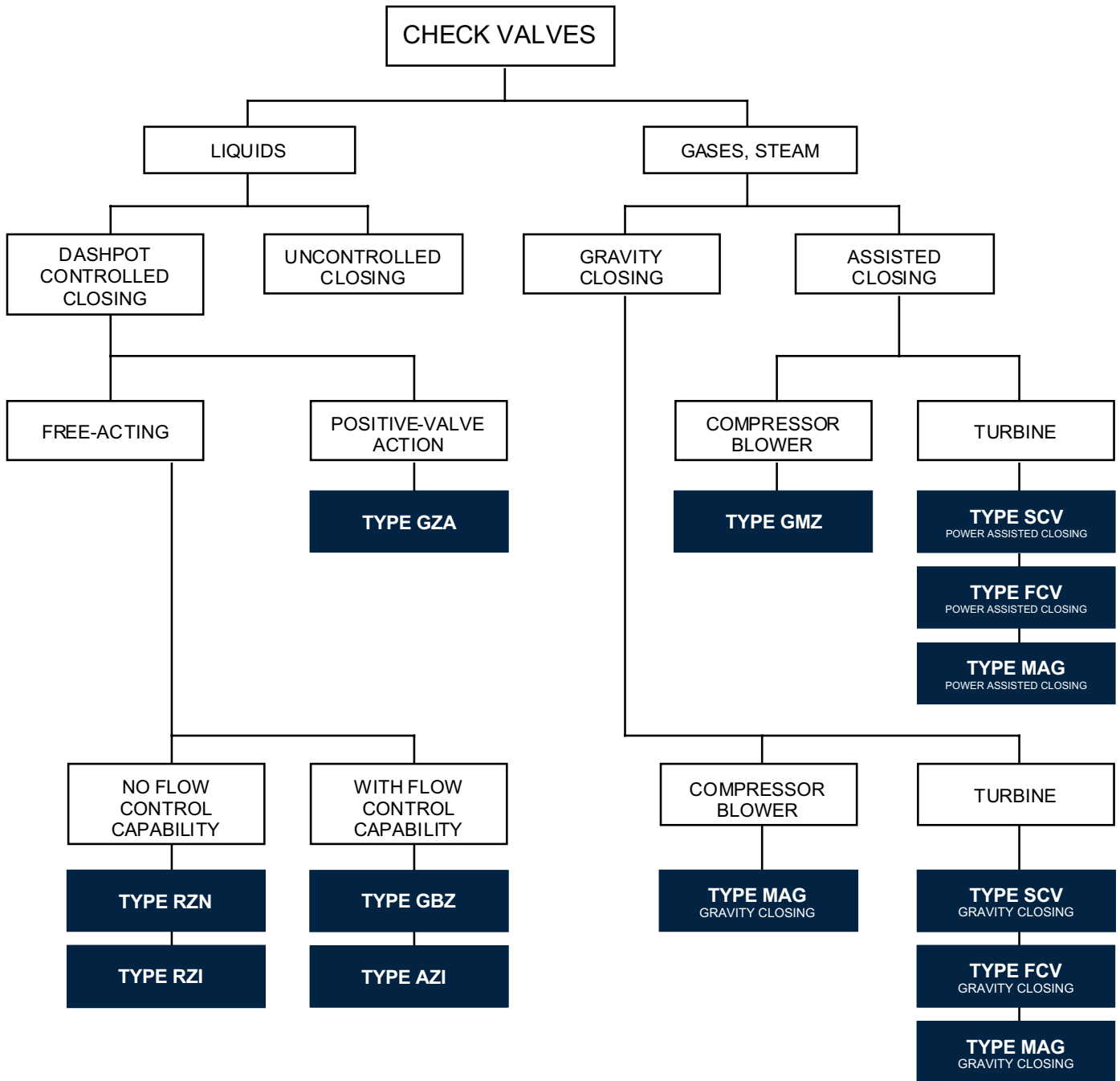
Type MAG Page 18

Conclusion Page 19



Choosing the Right Valve – Selection Guide

The Selection Diagram below lists all ADAMS check valve types together with selection criteria which should provide some assistance in finding the proper check valve type for a specific application.



Liquid or Gas and Steam Flow

As shown in the Selection Diagram on page 5, a distinction has been made between liquid and gas or steam flows. The reason for this distinction is as follows:

- The difference in inertia and elasticity of the different fluid types.
- The time it takes for the flow velocity to become zero after a pump, compressor or turbine trip. The time until flow reversal, with gas or steam flows, can go to zero in less than 0.2 seconds in some applications.

LIQUIDS

DAMPER CONTROLLED CLOSING OR UNCONTROLLED CLOSING

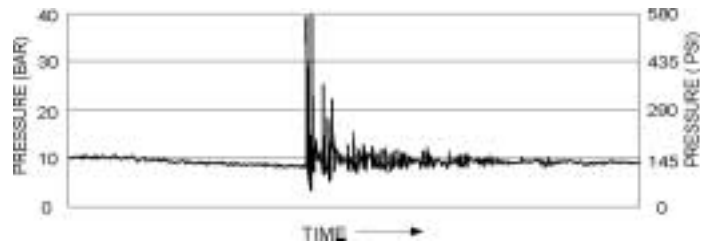
Check valves are designed to allow flow in one direction and prevent flow in the opposite direction. Ideally, check valves should begin closing on, or just prior to, pump trip, close slowly with decreasing flow, and close completely at zero flow condition.

The disc of a check valve without a damping device will be accelerated in the closing direction when subjected to backflow and will slam shut, giving rise to high pressures on the downstream side. These pressure changes are frequently called waterhammer because of the sound which often accompanies the pressure surge.

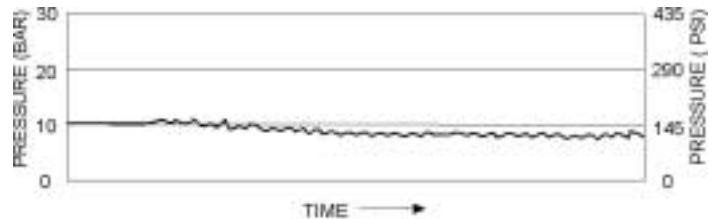
The rapid and uncontrolled closure of an undamped check valve due to flow reversal produces a dynamic impact load on the disc and body seat. Stresses caused by the impact load can lead to serious damage of valve internals or, in the worst case, those internals are broken off depending on the magnitude of the impact load and the adequacy of the valve design. The magnitude of the dynamic impact load depends solely on the velocity of the disc at impact and the inertia of the moving valve parts.

Unlike the performance on undamped check valves, the ADAMS range of damped check valves provides the feature of a controlled closing action on the cessation of forward flow due to the use of a hydraulic damper. The ADAMS damped check valve can initially close undamped rapidly with decreasing forward flow and will gradually slow the disc closing speed to slowly reduce the backflow.

This controlled closing action of the damped check valve attenuates significantly the magnitude of pressure surge. In addition, the dynamic impact load on the check valve is reduced to negligible value.



Multi-pump installation. 1 pump in service, 1 pump tripped out. Pressure rise on downstream side after closure of undamped check valve of size DN 400 (16")



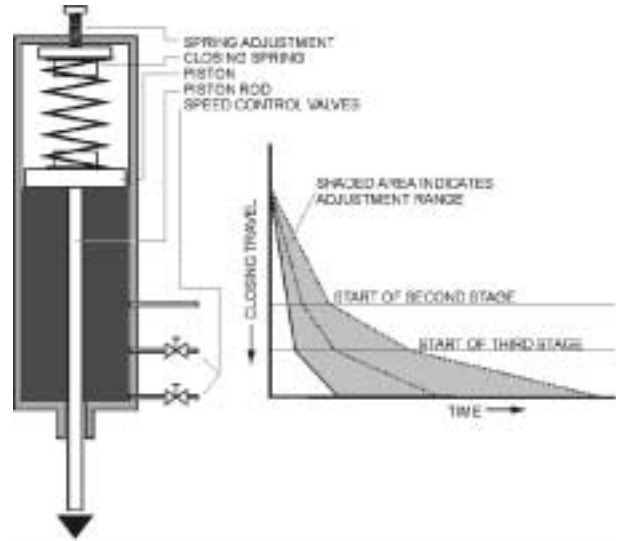
Same installation and service conditions as above. Downstream pressure after closure of ADAMS RZN DN 400 (16") with damping device

MULTIRATE ADJUSTABLE DAMPING SYSTEM

The hydraulic dampers, as used on ADAMS check valves, provide a number of features:

- Closing spring to initiate disc closing acceleration at the start of flow transient.
- Up to three-stage damping to meet the most complex system requirements.
- Adjustable damping rates to control the disc closing speed.

All of these features are conveniently accessible from the outside for adjustment to tune the check valve performance during start-up.



RZN with adjustable damping system

It is frequently assumed that the magnitude of pressure surge resulting from a rapid check valve closure under reverse flow conditions may only present a problem for low pressure piping systems. However, the pressure surge can easily rise to values that are 10 times the steady state system pressure. With water as the flowing media in steel piping, the maximum surge pressure is approximately 10 bar (145 psi) for every 1 m/s (3,28 ft/s) change in the flowing velocity. The pressure surge travels from the source of velocity change (the slamming check valve) at the speed of sound through the piping system. As a result, not only the check valve is subjected to the pressure surge but also the entire piping system.

Surge does not originate with the check valve, but it can be magnified by incorrect valve selection or attenuated by the correct one. Rapid uncontrolled closure of a check valve out of tune with the fluid system can be catastrophic.

FREE-ACTING OR POSITIVE VALVE ACTION

In many applications, it is commonly required that a check valve automatically opens on forward flow and closes on cessation of flow without any external signal or energy supply. The automatic, or free-acting performance, of the ADAMS check valve ensures extremely reliable system protection.

The demand for positively operated valves has increased particularly in sizes ranging from 1200 mm (48") to 3000 mm (120"). These valves are usually used on pump discharge lines to function as a check valve. On pump start-up, the valve is positively moved to full open, and on pump trip, due to receipt of a trip signal, the valve will close.

The advantage of a positively operated valve, over a free-acting check valve, is the reduced pressure loss across the valve, due to its full open position, regardless of flow rate, and the streamlined design of the valve interior. The advantage of a free-acting check valve is the automatic response to flow changes without requiring an external signal or energy supply.

Nominal Diameters:

500 mm / 20 inches
to 4000 mm / 160 inches

Temperature Range:

-20° C / -4° F
to +150° C / +302° F

Pressure Class:

PN 2,5/6/10/16/25/40/64
ANSI 150/300

Features:

- controlled emergency shut-down valve with tight shut-off and check valve function
- hydrodynamically profiled disc
- double eccentric shaft
- operation: externally located closing weight and hydraulic servo-actuator

Advantages:

- low flow loss coefficients
- maintenance friendly design
- tailored design with extensive accessories

Options:

- back-up seal for maintenance
- multirate adjustable interval damping system
- hydraulic operation
- electronic control systems
- overspeed detector
- orifice plates
- disc locking device, mansafe design
- vulcanized hard rubber coating
- butt weld ends



Pipe Break Safety Device, Turbine Protection, Pump Protection

The design of GZA valves utilizes the type OSK tight shut-off valve as the basis, and an external lever and closing weight with a hydraulic cylinder.

The valves are usually supplied with a hydraulic power unit which can be fitted to the valve as a compact, self-contained unit.

On pump start-up, the valve is positively opened and remains in the full open position during normal service due to hydraulic pressure applied to the external hydraulic cylinder. On pump trip, the valve is also tripped to close on its own accord by means of the lever and closing weight. As the valve closes, the hydraulic cylinder is used as a damping device providing two- or three-stage multirate adjustable and controlled closing action.

Use of multiple valves and sensors, which initiate the trip action, can increase the system redundancy to ensure the safety aspects of the valve performance. The trip signal can be either hydraulic or electric.

GZA valves are frequently used in power plant applications to reliably protect large pumps in the cooling water system against reverse flow.



Emergency shut down valve 3650 mm / 144 inches for a hydroelectric power unit



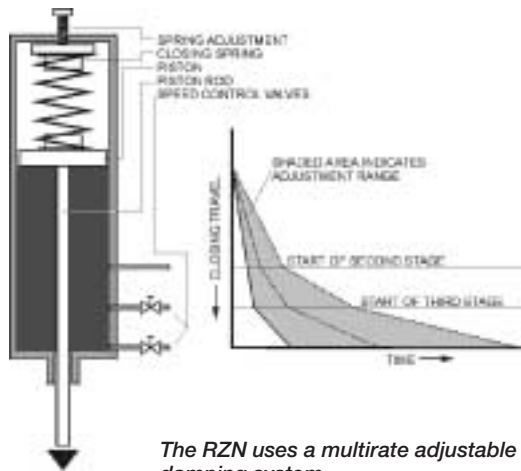
Hydraulic cylinder for a hydroelectric power unit



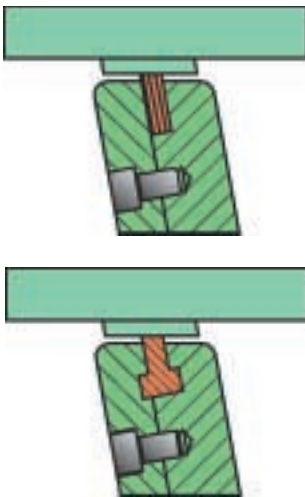
The RZN is an ultra-reliable, non-slam check valve

This fast-acting, tilting disc check valve, with low inertia, ensures quick valve response to liquid flow changes. The triple eccentrically mounted disc provides maximum hydro-dynamic performance for low pressure loss and freedom from jamming and flutter. If waterhammer is the prime concern, the closure speed can be adjusted to meet the system requirements. This is also important for the long term flexibility of plant operations. Even if future piping or system changes are made, the valve can always be adjusted to match the new set of system characteristics.

The RZN type check valve, with its multirate adjustable damping system, offers complete primary protection in even the most adverse applications. The compact design allows installation in very confined spaces.



The RZN uses a multirate adjustable damping system



RZN-sealing systems:
Laminated metal-to-metal or resilient seal

The ADAMS inclined conical seal system ensures that shut-off against reverse flow is tight and progressive.

Nominal Diameters:
150 mm / 6 inches
to 1000 mm / 40 inches

Temperature Range:
-50° C / -58° F
to +200° C / + 392° F

Pressure Class:
PN 10/16/25/40/64
ANSI 150/300/600

- Features:**
- non-return valve with controlled, non-slam closure
 - resilient seal or laminated metal-to-metal seal
 - triple offset design with inclined conical sealing system
 - adjustable hydraulic damping system, located externally and separated from the media

- Advantages:**
- complete pump protection
 - low flow loss
 - progressive sealing system
 - axial pressure balanced shaft seals for low friction
 - auto-closing
 - damper adjustment locking
 - additional screw safety device
 - prepared for retro-fitting of counterweights if flow conditions change

- Options:**
- damping system for opening
 - flow control valves
 - disc locking device, mansafe design
 - additional counterweight
 - vulcanized hard rubber coating
 - butt weld ends

Nominal Diameters:

500 mm / 20 inches
to 3000 mm / 120 inches

Temperature Range:

-50° C / -58° F
to +200° C / +392° F

Pressure Class:

PN 2,5/6/10/16/25/40
ANSI 150/300

Features:

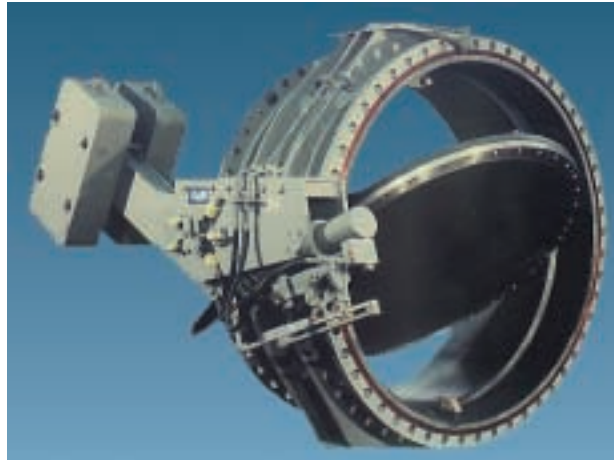
- non-return valve with multirate adjustable interval damping system
- resilient seal or laminated metal-to-metal seal
- triple offset design with inclined conical sealing system
- three adjustable independent damping rates
- auto-closing
- damper adjustment locking

Advantages:

- controlled non-slam closure
- adjustable closing characteristic
- additional screw safety device
- prepared for retro-fitting of counterweights, if flow conditions change
- longevity, even for frequent cycle operation

Options:

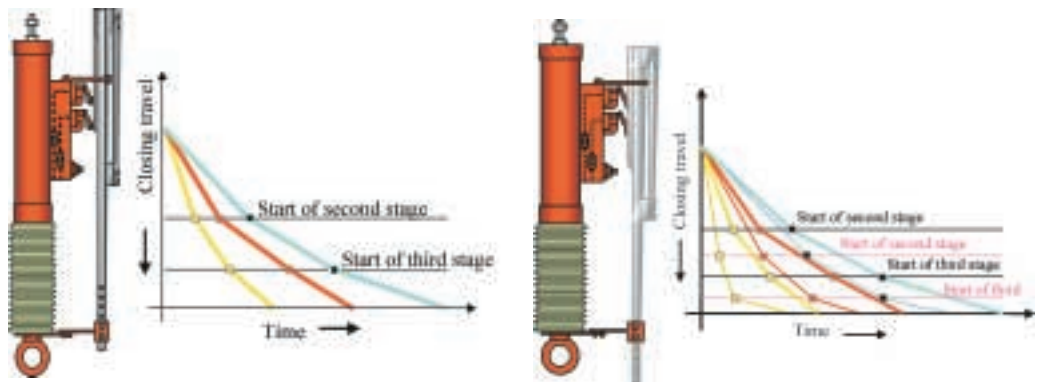
- damping system for opening
- pneumatic or hydraulic power pack for positive operation
- disc locking device, mansafe design
- additional counterweight
- vulcanized hard rubber coating
- butt weld ends



The RZI is essentially the same basic design configuration as the RZN except for its more advanced damping system which is setting new standards in surge control. Using ADAMS exclusive multirate adjustable interval damping system, the RZI provides the optimum control over surge in liquid transmission lines. In addition to providing speed adjustment for each of three

separate damping rate increments, the point during the check valve closing travel at which each rate change occurs is completely adjustable. This means that the RZI can be tuned to exactly match the closing characteristics required in a pump installation to prevent excessive pressure surge.

A multirate, adjustable interval damping system provides the optimum control over surge in large diameter pipelines. The RZI provides adjustment for each damping rate and also the timing of rate increased during check valve closure. This means that a damping sequence can be tuned to precisely match the closing characteristic required by a pump installation in order to avert an excessive waterhammer.

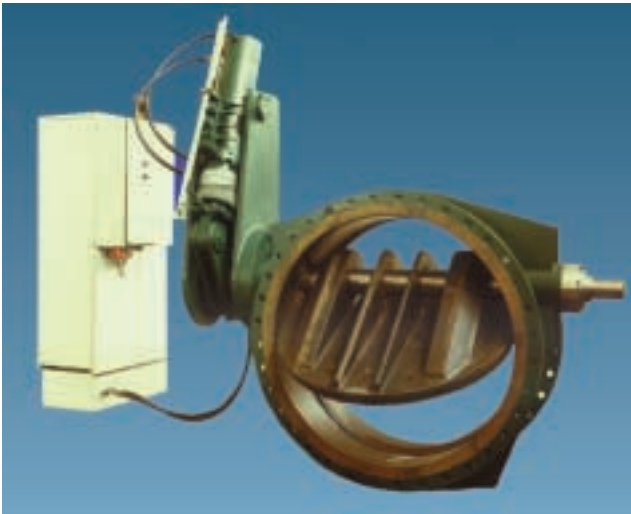


By turning flow control valves on the damping cylinder, the disc closing speed can be adjusted. By moving the trigger lever, the point of disc travel on which flow control valves are triggered, can be changed

NO FLOW CONTROL CAPABILITY OR FLOW CONTROL CAPABILITY

The conventional check valve generally provides no capability for flow control and is solely utilized for the check valve function.

In many applications, however, the check valve is installed in the piping system in series with a shut-off valve. Check valves need five times the nominal diameter piping space down stream before an additional valve is placed into service. This means extra weight, length and more supports and hangers are necessary. A check valve, with additional gate valve, requires four flanges, four gaskets and four sets of bolting. A combination shut-off and check only requires two sets of each. It is, therefore, a reasonable idea to combine the functions of the two valves in a single valve.



AZI (pictured here with a hydraulic unit) and GBZ are both examples of ADAMS combined check and tight shut-off valves

Combined Check Valve Features:

- *Installation space and costs savings*
- *Reduction in pressure loss*
- *Flow control capability together with the priority check valve function*
- *Possible use as a drain valve*
- *Lost motion coupling ensures priority function as a check valve so that the valve auto-closes from any position*

Nominal Diameters:

100 mm / 4 inches
to 800 mm / 32 inches

Temperature Range:

-50° C / -58° F
to +200° C / +392° F

Pressure Class:

PN 2,5/6/10/16/25/40
ANSI 150/300

Features:

- 3 in 1 combination valve for tight shut-off, control and non-return function in one compact unit
- resilient seal or laminated metal-to-metal sealing
- triple offset design with inclined conical sealing system
- auto-closing
- minimum pressure loss in open position
- multirate adjustable damping system, located externally and separated from the media

Advantages:

- multi-function
- compact design
- minimum pressure loss
- stable operation
- controlled, non-slam closure
- additional screw safety device
- prepared for retro-fitting of counterweights if flow conditions change

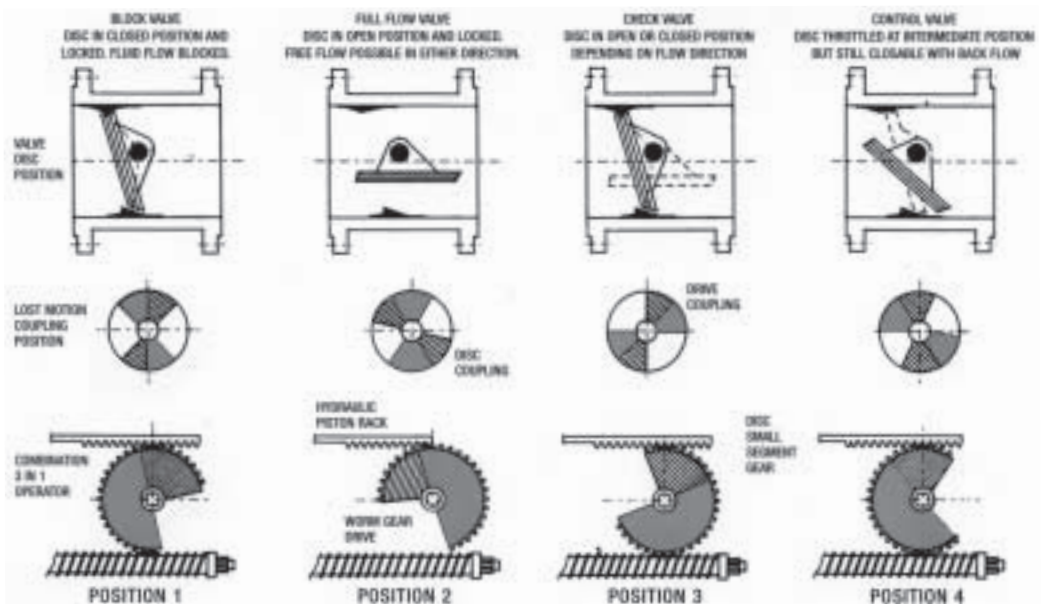
Options:

- wide choice of actuators and control systems
- disc locking device, mansafe design
- additional counterweight
- vulcanized hard rubber coating
- butt weld ends



This combination stop and check valve combines tight shut-off, flow control and check valve functions in a single compact unit. Like the type MAG, RZN and RZI designs, a fast-acting, tilting disc check valve is used as the basis for the GBZ design. The GBZ is fitted with a compact gearbox which contains the reduction gear, lost motion coupling and a hydraulic damping unit. The lost motion coupling ensures priority function as a check valve so that the valve can auto-close from any partial or full open position. Throttling of the valve, which can be achieved by turning the handwheel, can be quite useful for filling a piping system during start-up

or after an outage. Additionally, the valve disc can be locked in full open position by turning the handwheel to drain a piping system. The handwheel can even be replaced in the field with an electric actuator for automated remote operation.



Stop and Check in one valve made possible by lost-motion coupling

The integral, hydraulic damping cylinder provides multirate adjustable damping for controlled and non-slam closure to cope with arduous system requirements. Since the GBZ can replace two conventional valves, there are a number of savings such as less weight, less space, lower installation costs and low pressure loss.

These features make the GBZ ideally suited for installation on pump discharge lines.



AZI-AGF with gearbox/handwheel and hydraulic damping cylinder

integral lost motion coupling on the other. The hydraulic damping unit provides optimum control over surge pressure in liquid piping systems. Fully adjustable damping increments in conjunction with adjustable damping strokes ensure a fully controlled and non-slam closing action.

The gearbox, including a lost motion coupling, provides flow control and automatic check valve function which can be very beneficial for filling a piping system. The handwheel at the gearbox can easily be replaced with an electric actuator for remote operation. As an alternative, the AZI gearbox can be replaced with a hydraulic power unit which permits the use of the hydraulic damping cylinder for positive valve operation.

The AZI is manufactured in two basic designs:



AZI-AGF (On the left side, two options for operation - either a gearbox and handwheel or an electric actuator. Hydraulic damping cylinder, on the right)



AZI-VHS (On the left side, the hydraulic actuator with damping function, connected to a hydraulic unit. On the right, an optional mounting of lever and weight)

The AZI is a beneficial choice for every installation calling for the application of a shut-off valve and a non-slam check valve in larger sizes or higher pressures than the GBZ was designed for.

Nominal Diameters:

500 mm / 20 inches
to 3000 mm / 120 inches

Temperature Range:

-50° C / -58° F
to +200° C / +392° F

Pressure Class:

PN 2,5/6/10/16/25/40
ANSI 150/300

Features:

- 3 in 1 combination valve for tight shut-off, control and non-return function in one compact unit
- resilient seal or laminated metal-to-metal sealing
- triple offset design with inclined conical sealing system
- auto-closing
- minimum pressure loss in open position
- multirate adjustable interval damping system

Advantages:

- multifunction
- compact design
- minimum pressure loss
- stable operation
- controlled, non-slam closure
- additional screw safety device
- prepared for retro-fitting of counterweights if flow conditions change

Options:

- wide choice of actuators and control systems
- disc locking device, mansafe design
- additional counterweight
- vulcanized hard rubber coating
- butt weld ends
- complete hydraulic unit



GASES, STEAM

GRAVITY CLOSING OR POWER ASSISTED CLOSING



For the protection of rotary equipment such as compressors and turbines against reverse flow, it is sometimes suitable to utilize check valves where closing is achieved just by gravity. These valves are usually identified as non-critical check valves.



When protection of valuable rotary equipment against reverse flow is of critical importance, check valve designs are available as combined function or power assisted closing check valves where some method of positive actuation is added to the basic auto-closing valve. These power assisted closing actuators, fitted to the check valves, overcome increased inherent valve friction cause by any deposits or wear due to frequent cycling. They are providing a backup protection for rotating equipment because they are forcing valve closure in the event the check valve should fail to auto-close on cessation of flow.



Positively assisted closing action is frequently required for check valves utilized on large compressor discharge lines and on steam extraction lines to heaters where a large amount of energy is stored in the specific extraction system. Methods of actuation include double-acting pneumatic or hydraulic cylinders with options of spring return or accumulator stored energy systems.



Another feature of the power assisted closing actuators is the optional provision for on-load exercising, a test procedure which is widely used with check valves installed in steam extraction lines from turbines. The actuator is periodically tripped (sometimes daily), and as the valve disc is momentarily forced far enough closed to demonstrate that the check valve operates freely and returns to its initial operating position after actuation force is removed. On-load testing can be performed locally or remotely.

Adams check valves suitable for gas or steam applications: GMZ, SCV, FCV and MAG



GMZ with pneumatic closing actuator, solenoid valve and hydraulic damping system

The ADAMS type GMZ assisted non-slam check valve is designed for gas systems where ultra-reliable, high-integrity operation is required. The basic disc element is a fast acting, tilting disc check valve with stable flow response. Disc movement is controlled by a lever, an adjustable closing weight and a light hydraulic damper to prevent slam or disc oscillation. Assisted closing is provided by a single-acting pneumatic cylinder connected to the lever arm by a clevis. The pneumatic actuator is controlled by a solenoid valve which permits tripping for positively

assisted closure with either a de-energized or energized state. The solenoid valve is normally operated through a compressor start-up and shut-down signal.

In normal GMZ operation, the disc is opened by forward flow to a position where flow and gravity forces are balanced. With loss of forward flow, the GMZ will auto-close as the hydraulic damper permits smooth non-slam closure. In addition, normal shut-down procedure is initiated by a signal to the solenoid valve to start pneumatic assisted closure prior to cessation of the forward flow.

Special options and accessories available include air open / spring close actuators, steam jacketing, limit switches and position transmitter for remote indicate of disc position.

The type GMZ check valve is particularly suitable for installations in gas systems and widely used on compressor discharge lines.



Nominal Diameters:
100 mm / 4 inches
to 2000 mm / 80 inches

Temperature Range:
-50° C / -58° F
to +250° C / +482° F

Pressure Class:
PN 10/16/25/40
ANSI 150/300

Features:

- power assisted, compressor check valve
- resilient seal or laminated metal-to-metal seal
- triple offset design with inclined conical sealing system
- positive closure via spring loaded pneumatic actuator
- adjustable closing weight
- adjustable hydraulic damping system

Advantages:

- stable operation during flow transients
- capable of varying the pressure loss with closing weight adjustment
- axial pressure balanced shaft seals for low friction
- additional screw safety device
- long service life

Options:

- controlled, compulsory closure via pneumatic or spring-assisted actuator
- heating jacket
- accessories for remote control
- butt weld ends

Nominal Diameters:
150 mm / 6 inches
to 800 mm / 32 inches

Temperature Range:
steam up to 550° C / 1025° F

Pressure Class:
PN 2,5/6/10/16/25/40/64/100
ANSI 150/300/600

Features:

- gravity closing
- chromium steel disc plate
- stainless steel seat, fully integrated to the valve body seat
- operation: free swinging or with pneumatic closing assistance

Advantages:

- ANSI / FCI 70-2 Cl. V tight shut-off
- anti-blowout shaft design
- no sealing friction
- no packing friction
- low pressure loss by lost motion coupling
- high temperature compatibility
- inherently fire-safe
- low operation torques
- compact, robust construction
- low maintenance
- top entry mounting port
- field repairable

Options:

- free-swinging design
- pneumatic spring return actuator as closing assistance
- welding flanges
- duct for condense water release
- operation: pneumatic closing assisted



SCV with a pneumatic actuator for assisted closing

The ADAMS SCV check valves are designed for installation on the outlet side of steam turbines. These fast-closing, non-return valves protect the turbine from the back flow of steam or water, which may severely damage the turbine blades.



SCV body during ISO Certification on the 3D measuring machine

The free-swinging SCV design closes by gravity. A pneumatic actuator is standard for power assisted closing. This configuration features a two-piece shaft design connected by a free-travel clutch (lost motion coupling). The free-travel clutch is only engaged in the event of actuator closing. This design also eliminates frictional losses caused by the packing and does not increase the pressure loss.

Even after installation, the actuator may be mounted to the other side.

The standard SCV design features butt weld ends. Flanged end valves are also available.



The entire disc is made of chromium steel to reduce abrasive effects. The top entry mounting port allows disc replacement without removing the valve from the line.

The stainless steel inlayed seat is welded on the body and meets Class V tightness.

The SCV is thoroughly designed on a 3D-CAD system.





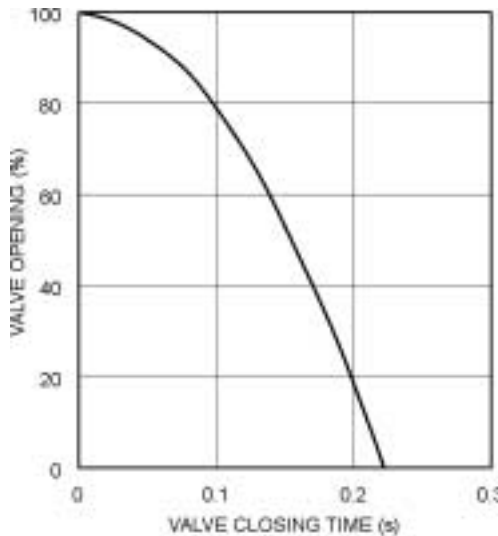
FCV with gravity closing

On loss of load, large steam turbines can rapidly accelerate to overspeed due to reverse steam flow caused by the energy contained in the extraction and feedwater heater system. Flow reversal can occur in less than 0.2 seconds and this can cause very high impact loads on check valve closure if delayed. This necessitates the special design features of the type FCV.



FCV with spring return pneumatic actuator as closing assistance

The FCV is a robust valve with low inertia moving parts designed to withstand very fast closure with complete reliability. The inclined tilting disc design ensures inherent gravity closure, stable operation, low pressure loss and fast response.



Closing time of a FCV of 450 mm (18") size, class 300 in free air

The FCV is designed to respond as rapidly as possible by means of low inertia components, optimum closing moment and minimum friction.

The type FCV has achieved an enviable record of reliability over long periods of services with very low maintenance, even in units with numerous shut-downs. The FCV, with gravity closing, is particularly designed for use on steam extraction lines to protect turbines against overspeed and partial water induction on load rejection.

Nominal Diameters:

100 mm / 4 inches
to 1200 mm / 48 inches

Temperature Range:

-196° C / -320° F
to +950° C / +1742° F

Pressure Class:

PN 16/25/40/64/100/160/250
ANSI 300/600/900/1500

Features:

- ultra fast-closing, non-return valve
- triple offset design with inclined conical sealing system
- optimum flow opening characteristics
- inherent gravity closure
- low inertia
- all parts designed to tolerate high impact
- fast response
- butt weld ends (body length ISO F5)

Advantages:

- robust forged steel construction
- excellent sealing characteristics at high and low operating pressure
- short closing travel
- absorption of high dynamic forces
- freedom from jamming at seat
- low friction
- no internal screw connections
- field replaceable disc
- minimum maintenance
- reliable operational function

Options:

- inspection/mounting port
- internal steam heating
- accessories for remote control
- flanged design
- power assisted: pneumatic, hydraulic or spring return actuator

Nominal Diameters:

100 mm / 4 inches
to 2000 mm / 80 inches

Temperature Range:

-50° C / -58°F
to 500° C / 932° F

Pressure Class:

PN 6/10/16/25/40
ANSI 150/300

Features:

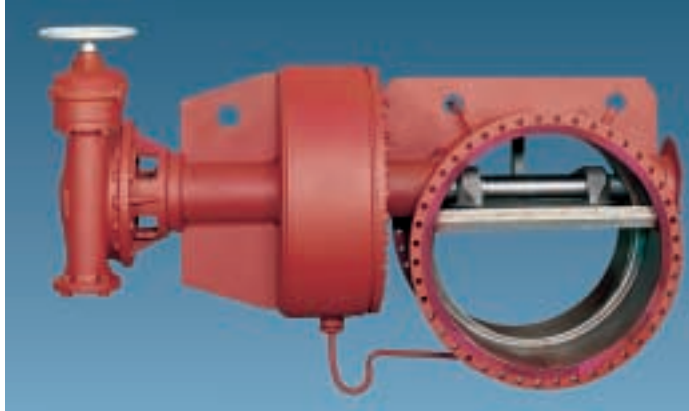
- quick-closing check valve with internal balance weight in a pressurized external housing
- laminated metal-to-metal sealing
- triple offset design with inclined conical sealing system
- opened by flow
- auto-closing
- fast-response at low differential pressure

Advantages:

- excellent sealing characteristics
- low pressure loss coefficients
- axial pressure balanced shaft seals for low friction
- additional screw safety device
- robust construction
- minimum maintenance

Options:

- manual or electrical override
- pneumatic or hydraulic actuator
- steam purge at seat
- heating jacket
- butt weld ends



MAG with manual close assistance

The ADAMS type MAG has been specially designed and developed for low pressure gas / steam service to protect steam turbines and compressors from the effects of reversal of gas / steam flow on trip or emergency shut-down. Its main features are ultra-reliable fast closure,

tight shut-off, low pressure loss and the ability to withstand a large number of cycles without failure.

The MAG is a gravity closing tilting disc check valve opened by gas / steam flow and designed to close rapidly just prior to flow reversal. The disc is profiled to improve aerodynamic lift, and the closing weight partially balances the disc weight in any open position to minimize pressure loss. The pressurized weight chamber is out of the flow stream to avoid the friction of a shaft seal and to further enhance reliability and reduce flow disturbance. The weight chamber is provided with adequate drains to eliminate problems with condensate or dirt build-up and is accessible for maintenance.

The MAG is also available with an actuator for positively assisted closure, which operates via lost motion coupling on the valve shaft. The coupling is contained in the weight chamber to ensure that shaft seal friction is not affecting the valve performance. Actuation can be either manual, electric, hydraulic or pneumatic.

The MAG is generally used on large, low pressure steam extraction lines either with or without power assisted closure as specified. Another application of the MAG is for use on process gas lines to protect large cracking furnaces against flow reversal during the switch-over procedure or due to a tube rupture in the furnace.



MAG with hydraulic close assistance



CONCLUSION

The check valve types, as presented in this brochure, are available in a wide range of sizes, pressure ratings and materials. In addition, many special construction features and various accessories can be supplied to meet requirements for specific applications.

The foregoing discussion, together with the Selection Diagram, lists the most common check valve applications. There are many special options and designs which cannot be covered in a brief guide like this. ADAMS produces many special valves (air admission, line break, emergency shut-down, etc.) some of which utilize check valve features. Leaflets giving detailed data on special applications are available on request.

When specifying check valves for major projects, it is advisable to consult your nearest ADAMS sales office or representative for specific information and advice.

Thank you for considering ADAMS.



ADAMS Armaturen GmbH

Baukauer Strasse 55
D-44653 Herne
Phone +49 - (0) - 2323 2090
Fax +49 - (0) - 2323 209286
Internet: www.adams-armaturen.de
E-Mail: info@adams-armaturen.de

ADAMS Schweiz AG

Badstrasse 11
CH-7249 Klosters-Serneus
Phone +41 - (0) - 81 4102222
Fax +41 - (0) - 81 4102229
Internet: www.adamsarmaturen.ch
E-Mail: info@adamsarmaturen.ch

ADAMS Valves Inc.

10649 Haddington Dr. No. 160
Houston, Texas 77043 U.S.A.
Phone +1 - (713) - 973-2490
Fax +1 - (713) - 973-2788
Internet: www.adamsvalves-usa.com
E-Mail: info@adamsvalves-usa.com



Since 1960, ADAMS' valves have been internationally proven acclaimed in all major industries and services.

The ADAMS name is synonymous with uncompromising quality.

Today, the ADAMS group has manufacturing facilities in Germany, Switzerland and the United States and multiple sales offices with authorized agents on every continent.

This widespread network assures optimum service to all customers.

To find your local sales agent please log onto one of our websites or contact one of the offices above.