

ADAMS

ARMATUREN

**Secure and reliable
check valves
for power plants**



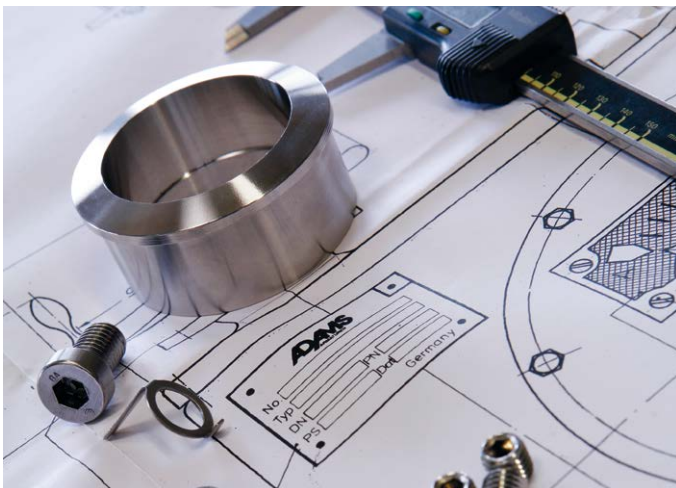
Made in Germany



The company

The plant in Herne was acquired in 1972 and the company management already planned a long way ahead. The land provided sufficient space to expand and thereby accommodate the fourteen production buildings erected so far, as well as the administration building. Today, more than 250 employees work in the main administration building and at the plant.

Our plant in Herne / Germany covers 70,000 square meters and currently performs practically all production steps required for the manufacture of valves, including welding, mechanical processing, assembling and approval. Only the making of cast parts is outsourced to certified foundries. We also operate a specially designed large-parts production area for manufacturing oversized valves. The broad scope of production that can be provided by the main plant in Herne is in keeping with the high degree of flexibility and quality that we offer our customers.



Commitment from all employees

Product development at Adams has always comprised two main areas: the general development of valves and details and the development of products specially designed for individual customers. In our view, we can only make real progress if research and development are solidly embedded as integrated corporate tasks. This also includes close interaction with other departments of the company, for example exchanging views with those of the sales department who pose questions straight from the market, or cooperation with the production department regarding the latest technologies, e.g. finishing processes, which enable the engineers' ideas to be implemented in the first place.

What we provide

We often receive enquiries including exhaustive specifications that clearly define the valve and its design within a certain framework. In these cases we can quickly and precisely supply the valve to suit the desired requirements. However, just as often we receive enquiries that our wide range of experience enables us to offer solutions for, using various types of valve that had not previously been thought of. In a number of cases, customers ask us to develop valves together with them for special applications. We are able to provide all of these services because of the great scope we have in both development and production.



Our values and principles

For over 60 years, ADAMS is leading in the development of triple eccentric butterfly valves and has constantly focused on innovation, reliability and high quality. During the last decades, we have developed different types of valves with numerous features and for various applications. With our expertise, we were - and still are - able to design the valves according to our customers requirements. We have delivered large quantities of valves that are in operation since decades.

ADAMS did not only enhance the valves but also itself. Today's success has been achieved by sticking to five principles: Availability, Design for environment, Adaptability, Made in Germany and Satisfied customers. At ADAMS, there are no particular important persons, at ADAMS we view all employees as a team. Without our team, we would not have been able to achieve such a success with high quality valves made in Germany. We would not have been able to design reliable and safe valves for critical application that last for years. We would not have been able to become world market leader in 2021.



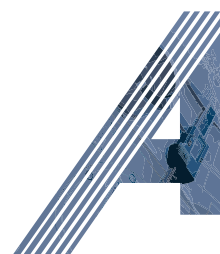
Availability

With our headquarter and main workshop located in Herne, Germany, we are taking advantage of the optimal distribution possibilities to deliver our valves. Airports, harbours and railway stations are nearby which enables us to deliver our valves by any means of transportation.

But ADAMS did not stay in Germany, in 1969 we have established our first foreign distribution office: The "Benelux" office in Breda, the Netherlands. Only ten years later, in 1972, the ADAMS Schweiz AG has been founded. In 1988 ADAMS Valves Inc. has been founded in Houston, Texas. Today, we have 350 employees worldwide.

Design for environment

Sustainability is one of the main values for ADAMS and we strive to implement it both in our work environment and in our valves. At our workshops, we have implemented an environmental management system according to DIN EN ISO 14001 and have set objectives for our company. We aim to reduce the energy consumption, production-related emissions, water and waste in our workshops and by doing so we reduce our impact on the environment.



Adaptability

High functional reliability under difficult operating conditions is one of the most important requirements for nearly all of our customers. As operating conditions can be highly individual, the majority of our valves are tailor-made to ensure they ideally meet our customer's needs.

When ADAMS was founded by Karl Adams, he has conquered the market not only with his patent for the triple eccentric sealing system but also with his idea of specially designed valves for the use in versatile and critical applications. During the years, our innovative spirit has stayed and many patents like the metallic sealing system have been registered.

Made in Germany

Since our foundation in 1960 we have expanded our production facility and our list of suppliers and partners. We have gained extensive experience and are able to manufacture our valves on our own in our plant in Herne, Germany. Due to this, we have complete control over all processes and are able to deliver high quality valves – made in Germany.



Satisfied customers

It has always been important to develop valves according to our customers requirements. This value has not changed during the last 60 years, as we still focus on long-term relationships both to our customers and suppliers. By keeping this focus, we were able to enhance our technologies and knowledge and are able to develop special valves for critical applications. Many of our customers have kept on re-ordering valves for other projects. The trust and loyalty of our customers has only intensified our will to maintain the course and keep on enhancing our product portfolio.

Product range

Check valves or non-return valves protect turbines or other equipment in the pipeline from damage due to back flow, as they allow fluid to flow only in one preferred direction. If the pressure in the pipe drops and the fluids momentum slows down, the check valve begins to close and as the flow direction reverses, the check valve will close completely. The closing time depends on the size and additional options.

Based on this simple operation, it appears that a single check valve design would be sufficient for use in any application. However, in addition to this basic non-return function there are other service requirements that 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 DN100 / 4" to DN3000 / 120"; pressure classes from PN2.5 to PN250 (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, developing 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.

ADAMS SCV and FCV

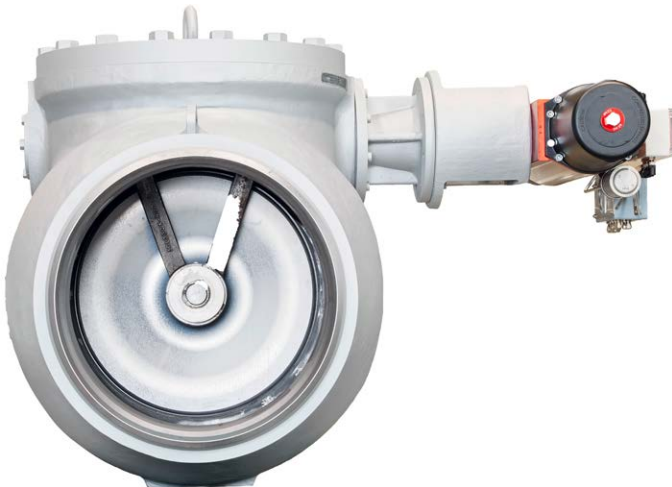
ADAMS has developed and enhanced two check valves especially for the use in power plants: type SCV and FCV. Both valves can be mounted in fossil and nuclear power plants and are, due to their robust bodies and capability to withstand high temperatures and pressures, reliable even in extreme conditions. The valves are designed for fast closing automatically. Both types can be supplied with an additional closing assistance. Due to their low friction, the valves operate for decades in normal circumstances without the need of repair but are none the less both partly field repairable.



Type SCV

SCV Check valves are exclusively installed at the outlet side of steam turbines. These fast closing non-return valves shall protect the turbine from back flow of steam or water which may severely damage the turbine blades.

The free swinging SCV design closes by gravity. The disc is designed to provide two times more gravitational closing force than required to overcome the frictional losses in the bearings. The disc plate is made of Chromium steel to reduce abrasive effects. The top entry mounting port allows disc replacement without removing the valve from line.



Optionally, a pneumatic actuator for power assisted closing can be added. 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.

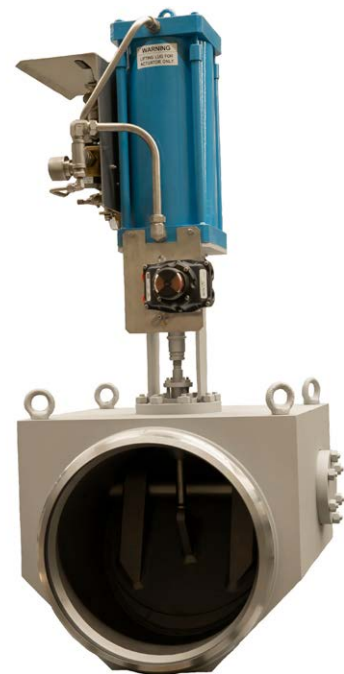
This design also eliminates frictional losses caused by the packings and does not negatively effect the pressure loss. Even after installation the actuator can be mounted to the other valve side.

The standard SCV design features butt weld ends. If a flanged design is preferred welding flanges can be added. The solid stainless steel seat ring is welded on the body and meets Class V tightness.

Type FCV

The FCV is a robust valve with low inertia moving parts 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.

This check valve has continually evolved through many years of experience with large steam turbines and compressors. On loss of load steam turbines risk rapid acceleration due to the stored energy in the feed heating system. Steam flow reversal can occur in less than 0.2 seconds. Compressors have a similar problem when an emergency shut down may lead to rapid flow reversal. These occasions cause very high impact forces on the check valve closure thus necessitating the special design features of ADAMS FCV valves



Type SCV



ADAMS check valve type SCV

Ideal protection from backflows for steam turbines

Extremely reliable check valves are needed to protect steam and gas turbines from reverse flows. With their reliable, non-jamming closures, our SCV valves are optimally designed to fulfil this important protective function.

SCV check valves efficiently protect these turbines from backflows coming from steam extraction pipes. This is guaranteed by a free-swinging model that closes automatically by means of its own weight. It swings closed against a double bearing friction moment without the assistance of a drive system. This makes extremely short closure times of under 0.5 seconds possible.

A hydraulic, pneumatic or electric fail safe drive can be added as a closure aid by means of a two-part stem construction.

The SCV is a robust cast valve with butt-welded ends. Welding neck flanges can be welded on. The valve disc made of chrome steel reduces abrasions.

The disc of an installed valve can be replaced via the inspection and assembly opening. The seal seat is manufactured by deposit welding and can be hard-coated if necessary.

Nominal diameters

150 mm to 1200 mm
 6 inches to 48 inches

Temperature range

Steam up to 550°C
 Steam up to 1025°F

Pressure class

PN2.5/6/10/16/25/40/64/100/160/250
 ANSI 150/300/600/900/1500

Others on request



Features

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

Advantages

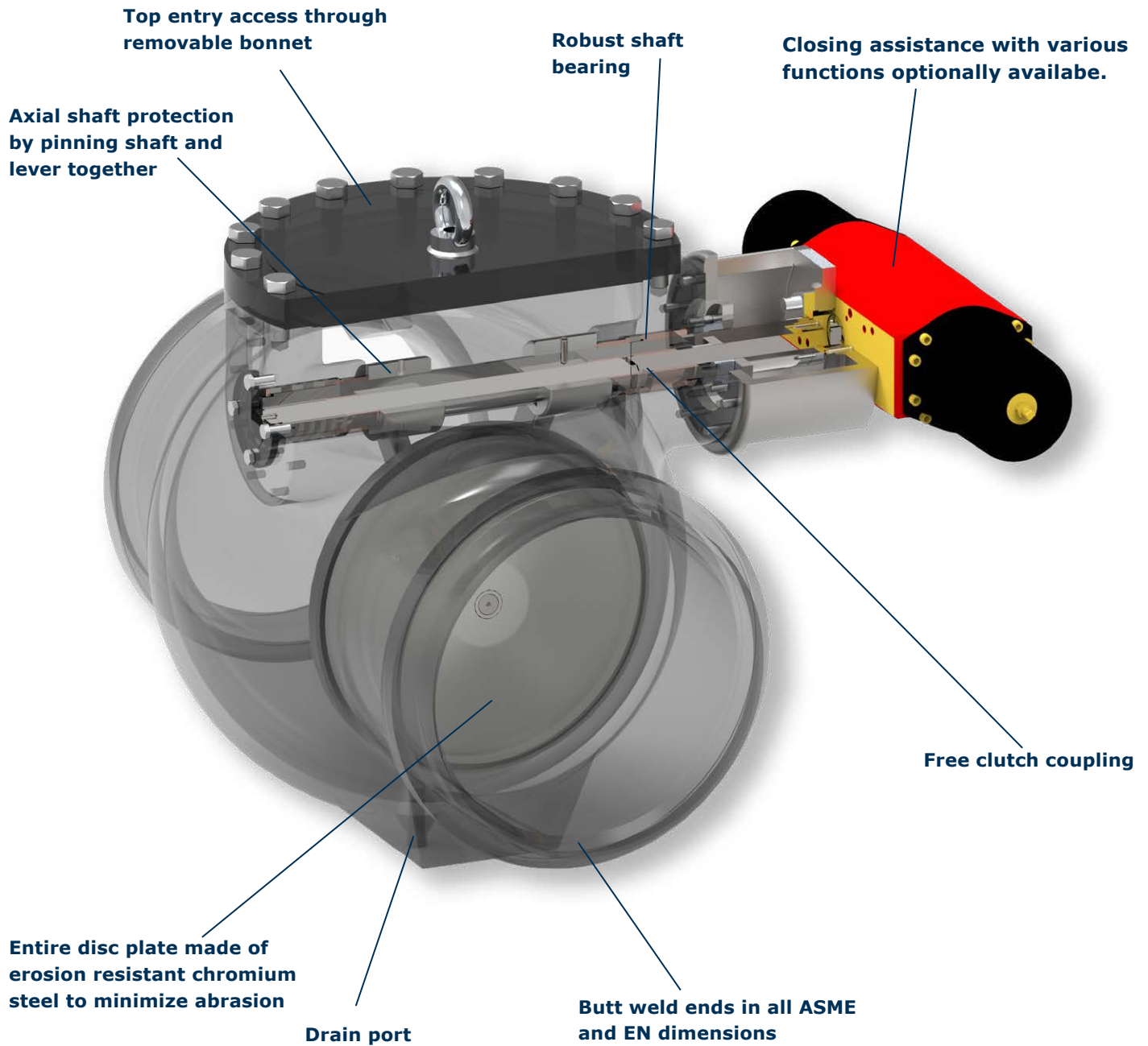
- ANSI / FCI 70-2 Cl. V tight shut-off
- anti-blowout shaft design
- no sealing friction
- no packing friction
- low pressure loss by lost motion coupling
- high temperature compability
- inherently fire-safe
- low operation torques
- compact, robust construction

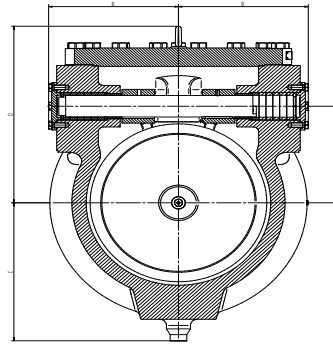
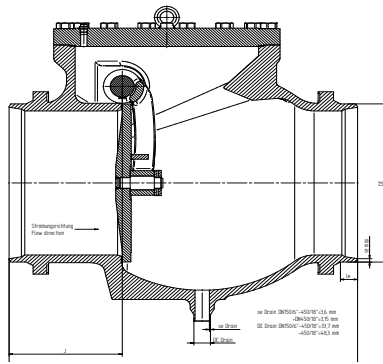
- low maintenance
- top entry mounting port
- field repairable
-

Options

- free-swinging design
- closing assistance
- welding neck flanges
- drain port for condense water release
- blow-off kit

Main features of the SCV





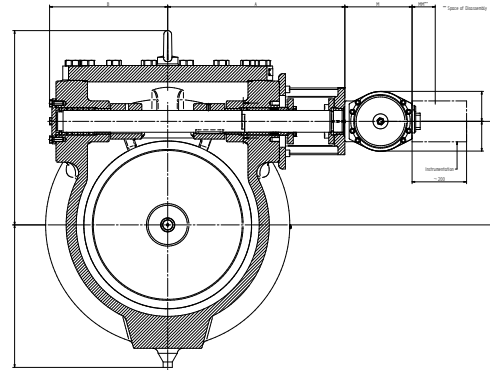
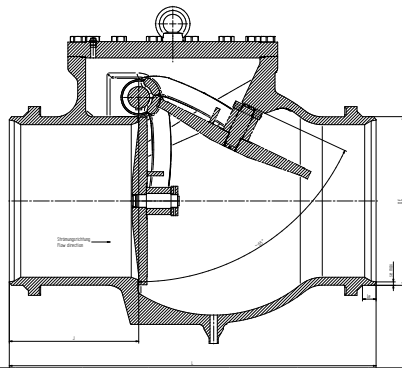
ASME Class 150/300 / PN10-40

DN/Inch	B	C	D	E	J	L	DE	s _{emax}	le	W
150 / 6"	200	154	271	120	155	444	168,3	5,7	40	90
200 / 8"	226	175	316	140	180	533	219,1	7,1	50	130
250 / 10"	251	207	346	170	210	622	273,3	9,0	50	180
300 / 12"	258	245	381	200	220	711	323,9	9,4	50	240
350 / 14"	273	275	416	220	285	838	355,6	15,3	50	350
400 / 16"	315	306	466	250	325	864	406,4	14,2	50	450
450 / 18"	356	347	526	285	350	978	457,0	16,0	50	680
500 / 20"	385	385	571	315	330	1016	508,0	16,5	50	870
550 / 22"	430	420	630	350	400	1118	559,0	17,0	50	1100
600 / 24"	440	458	713	380	475	1346	610,0	22,5	50	1350
650 / 26"	460	495	758	415	460	1346	660,0	20,0	50	1650
700 / 28"	510	550	76	430	505	1499	711,0	23,0	50	1900
750 / 30"	519	600	845	475	540	1594	762,0	23,5	50	2500
800 / 32"	587	615	878	500	610	1787	813,0	25,0	50	3050
900 / 36"	627	670	1004	560	690	2038	927	30	50	4700
1000 / 40"	671	740	1062	630	650	2038	1029	35	50	5290

ASME Class 600 / PN64-100

DN/Inch	B	C	D	E	J	L	DE	s _{emax}	le	W
150 / 6"	200	160	286	115	200	559	168,3	9,2	50	110
200 / 8"	231	195	326	150	215	660	219,1	12,1	50	180
250 / 10"	256	233	391	175	280	787	273,0	14,0	50	270
300 / 12"	263	260	413	200	270	838	323,9	19,5	50	370
350 / 14"	278	290	463	220	330	889	355,6	20,3	50	480
400 / 16"	320	322	532	250	355	991	406,4	21,7	50	650
450 / 18"	364	360	605	285	380	1092	457,0	23,5	50	1010
500 / 20"	390	395	643	325	430	1194	508,0	29,0	50	1250
550 / 22"	415	435	680	345	480	1295	559,0	29,5	50	1680
600 / 24"	445	470	741	380	525	1397	610,0	32,5	50	1950
650 / 26"	485	500	775	410	535	1448	660,0	35,0	50	2500
700 / 28"	519	550	879	440	540	1549	711,0	35,5	50	2990
750 / 30"	529	589	932	470	570	1651	762,0	38,5	50	3210
800 / 32"	595	695	967	500	560	1651	813,0	42,0	50	4200
900 / 36"	630	698	998	560	690	2038	927	55	50	6235
1000 / 40"	681	775	1155	640	750	2318	1029	60	50	8400
1100 / 44"	746	845	1203	980	840	2490	1079	65	50	10500
1200 / 48"	1070	950	1360	780	820	2540	1232	65	50	15500

Others on request.



ASME Class 150/300 / PN10-40

DN/Inch	A	B	C	D	E	E1	R1	G	H	J	L	M	MM	DE	semax	le	W
150 / 6"	342	200	154	271	120	55	49	200	200	155	444	130	35	168,3	5,7	40	117
200 / 8"	368	226	175	316	140	55	49	200	200	180	533	130	35	219,1	7,1	50	162
250 / 10"	393	251	207	346	170	75	69	90	285	210	622	175	42	273,0	9,0	50	212
300 / 12"	400	258	245	281	200	75	69	90	285	220	711	175	42	323,9	9,4	50	277
350 / 14"	415	273	275	416	220	75	69	90	285	285	838	175	42	355,6	15,3	50	382
400 / 16"	500	315	306	466	250	75	69	285	285	325	864	175	42	406,4	14,2	50	503
450 / 18"	539	356	347	526	285	76	76	317	317	350	978	222	41	457,0	16,0	50	734
500 / 20"	565	385	385	571	315	110	110	510	510	330	1016	278	69	508,0	16,5	50	1008
550 / 22"	610	430	420	630	350	110	110	510	510	400	1118	278	69	559,0	17,0	50	1225
600 / 24"	650	440	458	713	380	110	110	510	510	475	1346	278	69	610,0	22,5	50	1478
650 / 26"	670	460	495	758	415	110	110	510	510	460	1346	278	69	660,0	20,0	50	1818
700 / 28"	719	510	550	763	430	110	110	510	510	505	1499	740	70	711,0	23,0	50	2234
750 / 30"	790	519	600	845	475	110	110	510	510	540	1594	740	70	762,0	23,5	50	2700
800 / 32"	844	587	615	878	500	110	110	510	510	610	1787	740	70	813,0	25,0	50	3334
900 / 36"	884	627	740	1004	560	532	308	950	1445	690	2038	900	150	927	30	50	5750
1000 / 40"	954	671	810	1062	630	532	308	950	1445	650	2038	900	150	1029	35	50	6340

ASME Class 600/ PN64-100

DN/Inch	A	B	C	D	E	E1	R1	G	H	J	L	M	MM	DE	semax	le	W
150 / 6"	342	200	160	286	115	55	49	200	200	200	559	130	35	168,3	9,2	50	90
200 / 8"	368	231	195	326	150	55	49	200	200	215	660	130	35	219,1	12,1	50	130
250 / 10"	393	256	233	391	175	75	69	90	285	280	787	175	42	273,0	14,0	50	180
300 / 12"	400	263	260	413	200	75	69	285	285	270	838	175	42	323,9	19,5	50	240
350 / 14"	415	278	290	463	220	75	69	285	285	330	889	175	42	355,6	20,3	50	350
400 / 16"	500	320	322	532	250	76	76	317	317	355	991	222	41	406,4	21,7	50	450
450 / 18"	539	364	360	605	285	110	110	145	510	380	1092	278	69	457,0	23,5	50	680
500 / 20"	565	390	395	643	325	110	110	510	510	430	1194	278	69	508,0	29,0	50	870
550 / 22"	600	420	420	700	355	110	110	510	510	480	1295	278	69	559,0	29,5	50	1100
600 / 24"	650	445	470	741	380	110	110	510	510	525	1397	278	69	610,0	32,5	50	1350
650 / 26"	695	485	500	775	410	110	110	510	510	535	1448	278	69	660,0	35,0	50	1650
700 / 28"	739	519	550	879	440	110	110	510	510	540	1549	740	95	711,0	35,5	50	1900
750 / 30"	749	529	589	932	470	110	110	510	510	570	1651	740	95	762,0	38,5	50	2500
800 / 32"	844	595	695	967	500	110	110	510	510	560	1651	740	95	813,0	42,0	50	3050
900 / 36"	884	630	765	998	560	532	308	950	1445	690	2038	900	150	927	55	50	7285
1000 / 40"	928	681	845	1155	640	532	308	950	1445	750	2318	900	150	1029	60	50	9528
1100 / 44"	988	746	915	1203	980	532	308	950	1445	840	2490	900	150	1079	65	50	11620
1200 / 48"	1125	1070	1020	1360	780	532	308	950	1445	820	2540	900	150	1232	65	50	16600

Others on request.

Type FCV



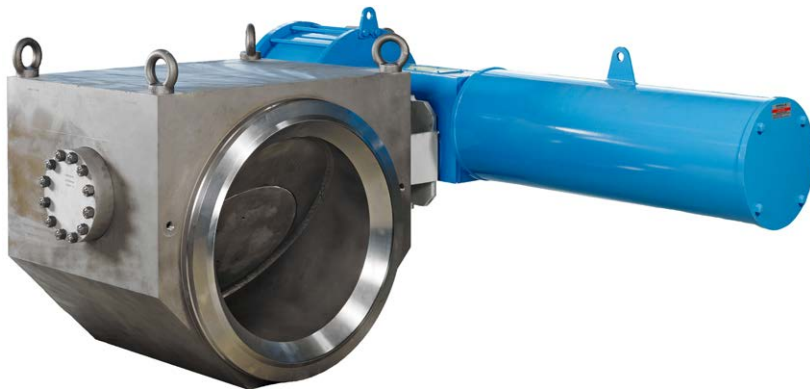
ADAMS check valve type FCV

FCV check valves protect large steam turbines and compactors when load shedding with flow reversal takes place in fractions of seconds. The specially designed valve closes automatically and absorbs the occurring high dynamic forces.

Modern high-performance steam turbines are efficient but expensive continuous flow machines, which need to be protected from possible damage. The FCV check valve features high responsiveness and automatic closure through its own weight within a mere 0.3 seconds. This is achieved through low moments of inertia, the short closure distance and the triple-eccentric closure system with obliquely positioned sealing cones. Force-actuated closure is possible with pneumatic, hydraulic or spring-loaded closing drives.

The FCV is equipped with a triple-eccentric shut-off system and is manufactured as a forged model. The seal seat can optionally be hard-coated. An inspection opening, an internal steam heating and a drainage connection are available as well as elements for remote transmission. The FCV is also available as a flange model.

There are two types of the FCV: Power assisted or free-swinging. The FCV can be used on the high pressure side for temperatures up to 550°C, pressure up to 100 bar and is available in sizes from DN150 to DN800.



Nominal diameters

150 mm to 1200 mm
6 inches to 48 inches

Temperature range

Steam up to 650°C
Steam up to 1202°F

Pressure class

PN2.5/6/10/16/25/40/64/100/160/250
ANSI 150/300/600/900/1500/2500

Others on request

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)

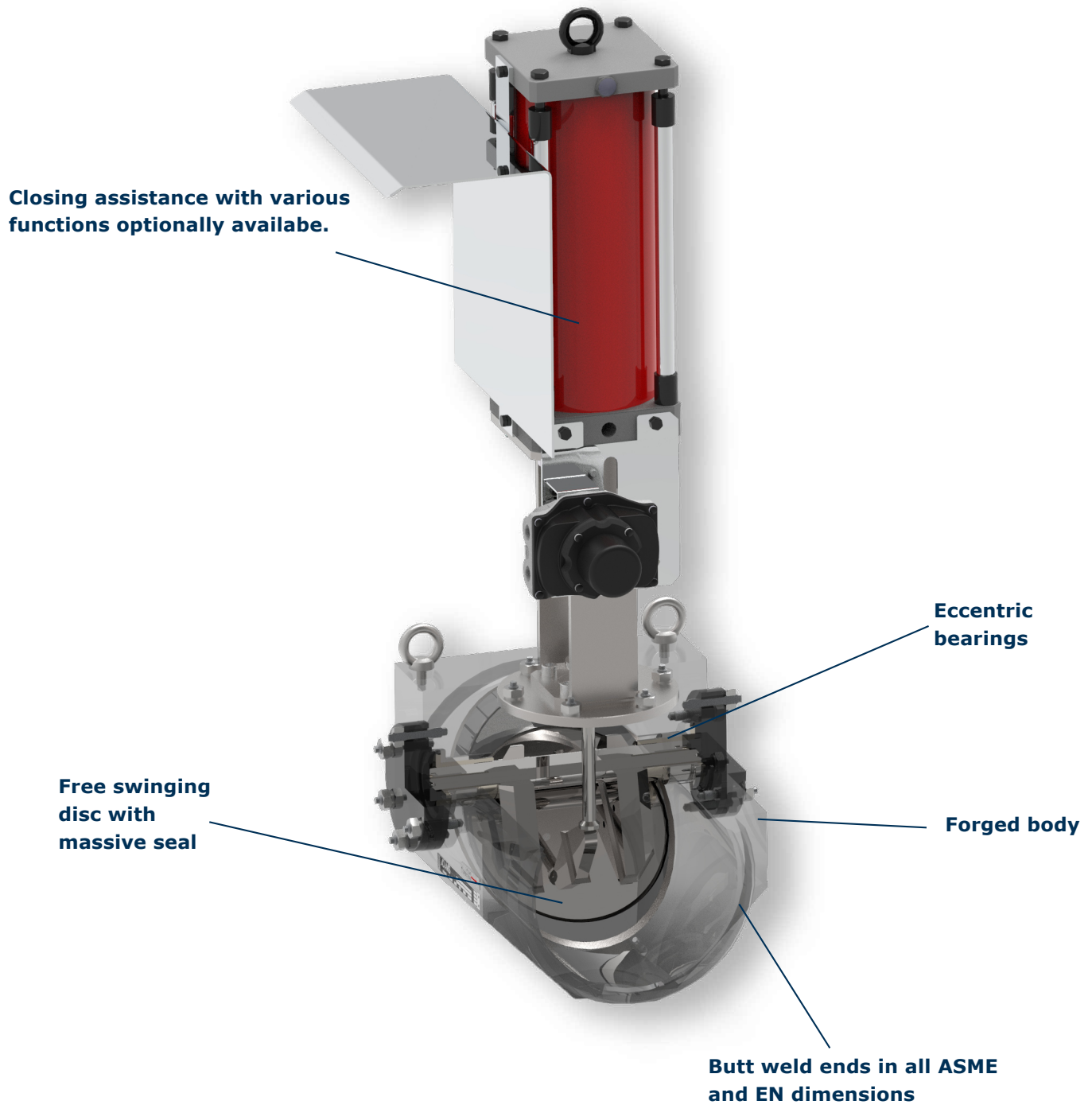
Advantages

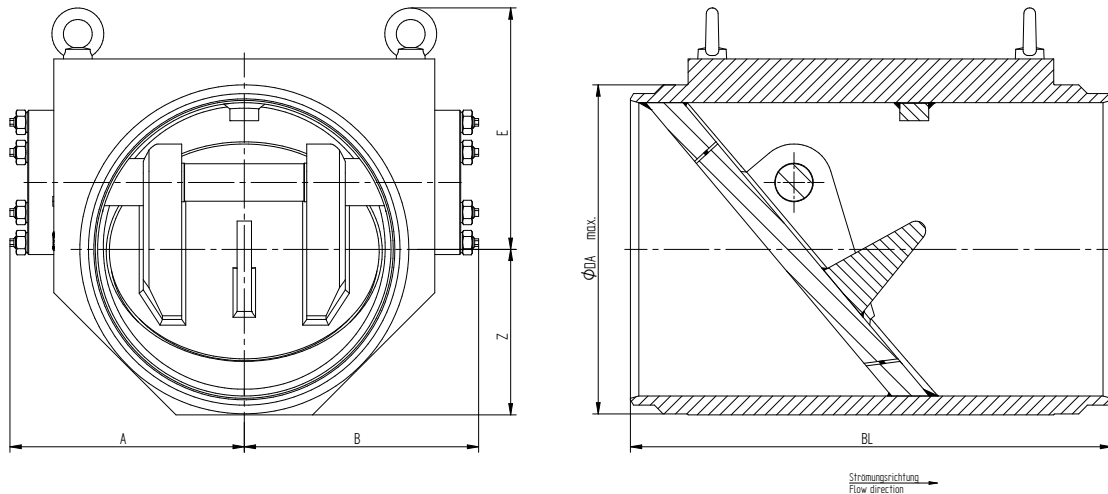
- robust forged steel construction
- excellent sealing characteristics at high and low operating pressure
- short closing travel
- absorption of high dynamic forces
- freedom from jamming at seat
- low friction
- no internal screw connections
- field replaceable disc
- minimum maintenance
- reliable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

Options

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

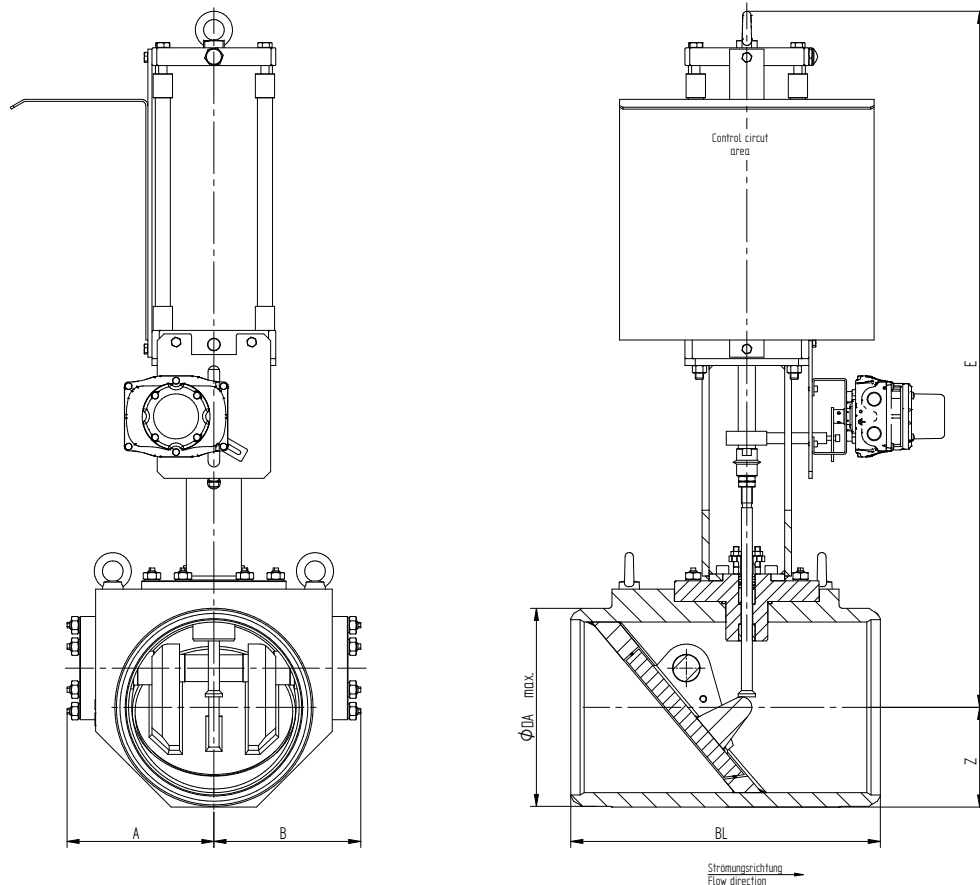
Main features of the FCV





ASME Class 600 / PN64-100							
DN/Inch	A	B	BL	E	Z	øDA	W
150 / 6"	160	160	300	160	90	178	70
200 / 8"	180	180	400	200	116	230	110
250 / 10"	220	220	450	230	145	288	190
300 / 12"	240	240	500	250	172	342	230
350 / 14"	270	270	550	270	188	374	300
400 / 16"	300	300	600	300	215	428	420
450 / 18"	330	330	650	340	241	480	580
500 / 20"	360	360	700	360	268	534	760
600 / 24"	420	420	800	430	320	636	1130
700 / 28"	480	480	900	530	370	736	1780
750 / 30"	520	520	950	550	400	794	2130
800 / 32"	560	560	1000	570	430	854	2510
900 / 36"	630	630	1100	640	475	944	4120

Others on request.



ASME Class 600 / PN64-100							
DN/Inch	A	B	BL	E	Z	øDA	W
150 / 6"	160	160	300	870	90	178	140
200 / 8"	180	180	400	900	116	230	180
250 / 10"	220	220	450	1000	145	288	270
300 / 12"	240	240	500	1030	172	342	310
350 / 14"	270	270	550	1190	188	374	390
400 / 16"	300	300	600	1210	215	428	510
450 / 18"	330	330	650	1240	241	480	670
500 / 20"	360	360	700	1260	268	534	850
600 / 24"	420	420	800	1540	320	636	1300
700 / 28"	480	480	900	1600	370	736	1950
750 / 30"	520	520	950	1630	400	794	2300
800 / 32"	560	560	1000	1650	430	854	2700
900 / 36"	630	630	1100	1690	475	944	4300

Others on request.

Quality surveillance



At ADAMS, we focus on high quality to guarantee longlasting and sustainable valves for our customers. Since 60 years, our valves are made according to the highest standards and regulations or by the specifications of our customers - all made in Germany. We work daily to retain this level of quality – systematically and with great attention.

Since 1960, we have expanded our buildings and halls, invested in state-of-the-art equipment and have constantly enhanced our valves with it.

Next to the equipment, we have invested as much in our employees. Many of them have started their apprenticeship at ADAMS and are still working for us. This guarantees the flow of information from our experienced employees to the next generation.

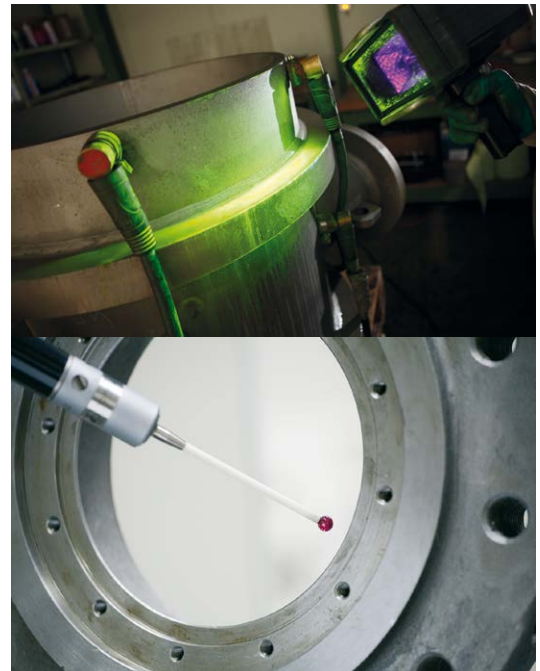
Our employees take great care in everything they do. They have a positive attitude towards their work that cannot be prescribed. It is part of a working culture that has come into being through many years of working together. It is all about the understanding of each individual employee for the quality requirements of our customers, but also as a reflection of the appreciation of their achievements by the executives and management.

Certification in accordance with DIN EN ISO 9001

The ADAMS quality management system in accordance with DIN EN ISO 9001 was certified for the first time in 1993. We have regularly obtained recertification ever since. Our quality management includes two points of central importance that we would additionally like to mention. Firstly, the particularly extensive training and further education of the company’s employees (see also pages 30–31) and secondly, the maintaining of the company’s own test stands for valves with state-of-the-art testing equipment that we use for scrutinising our finished products and prototypes. That typifies our systematic approach.

National standards and guidelines by which ADAMS is authorised to develop, produce and test:

- AD information sheets
- ANSI
- API
- ASME
- ATEX
- BS
- PED
- DIN EN ISO
- GOST
- KTA
- MSS
- NACE
- RCC-M

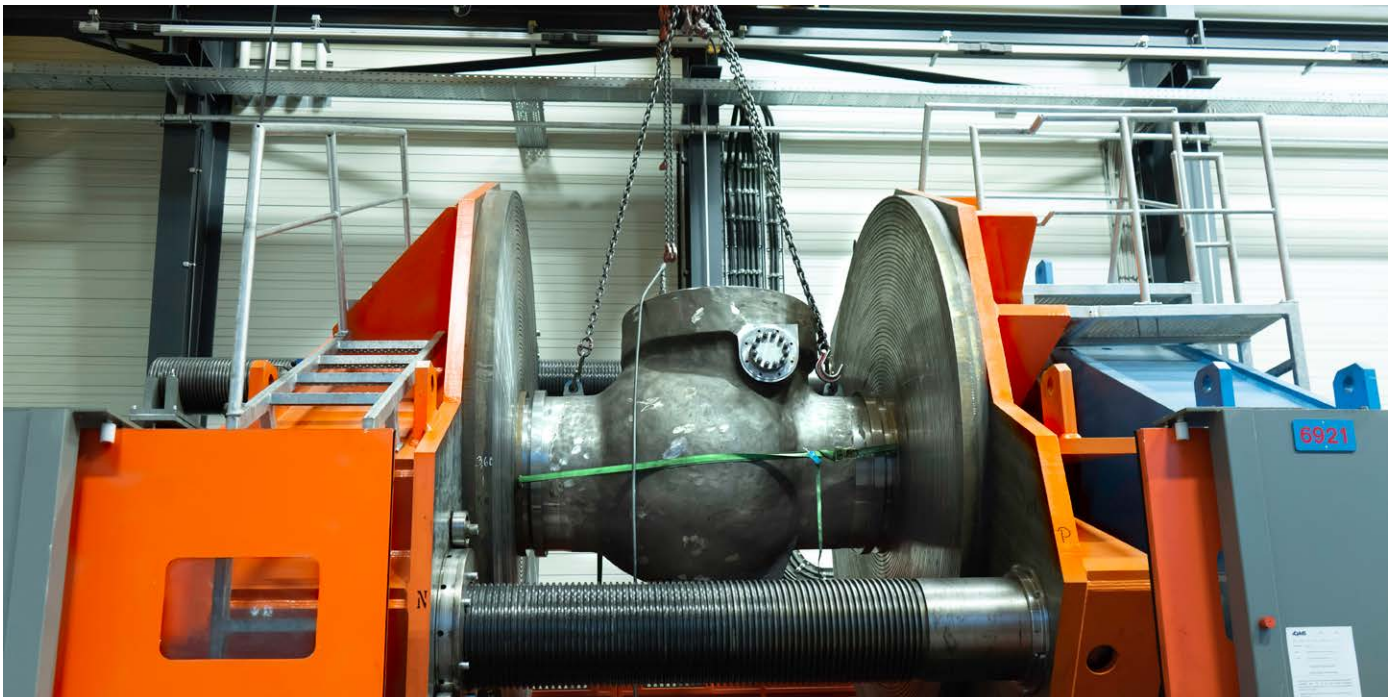


Environmental management system certified according to ISO 14001

Next to the ISO 9001 certification, ADAMS has received certification for the environmental management system according to DIN EN ISO 14001. It is one of our aims to fulfil both national and international environmental standards. We have implemented diverse production changes to be able to produce sustainable valves in an environment-friendly manner.

By testing our valves in our own in-house testing facility, we are able to guarantee their performance, high quality and longevity. This leads to long operation times and less leakage.

Quality tests



Our tests comply with the above-mentioned standards. We perform the testing processes with our own state-of-the-art equipment either personally in-house or in cooperation with well-known testing institutions.

Destruction-free testing procedures

- Dye penetrant test (PT)
- Magnetic particle test (MT)
- Ultrasound test (UT)
- Visual test (VT)
- Leak test (LT)
- Positive Material Identification (PMI)
- X-ray test (RT)



Contact information

ADAMS Armaturen GmbH
Baukauer Str. 55
44653 Herne / Germany
Tel +49 (0)2323 209 0
www.adams-armaturen.de
info@adams-armaturen.de

ADAMS Valves Inc.
12303 Cutton Road
Houston, Texas 77066
Tel +1 (281) 453 3750
www.adamsvalves-usa.com
sales@adamsvalves-usa.com

Imprint

ADAMS Armaturen GmbH

As of November 2021 | All rights reserved | Contents are subject to change.