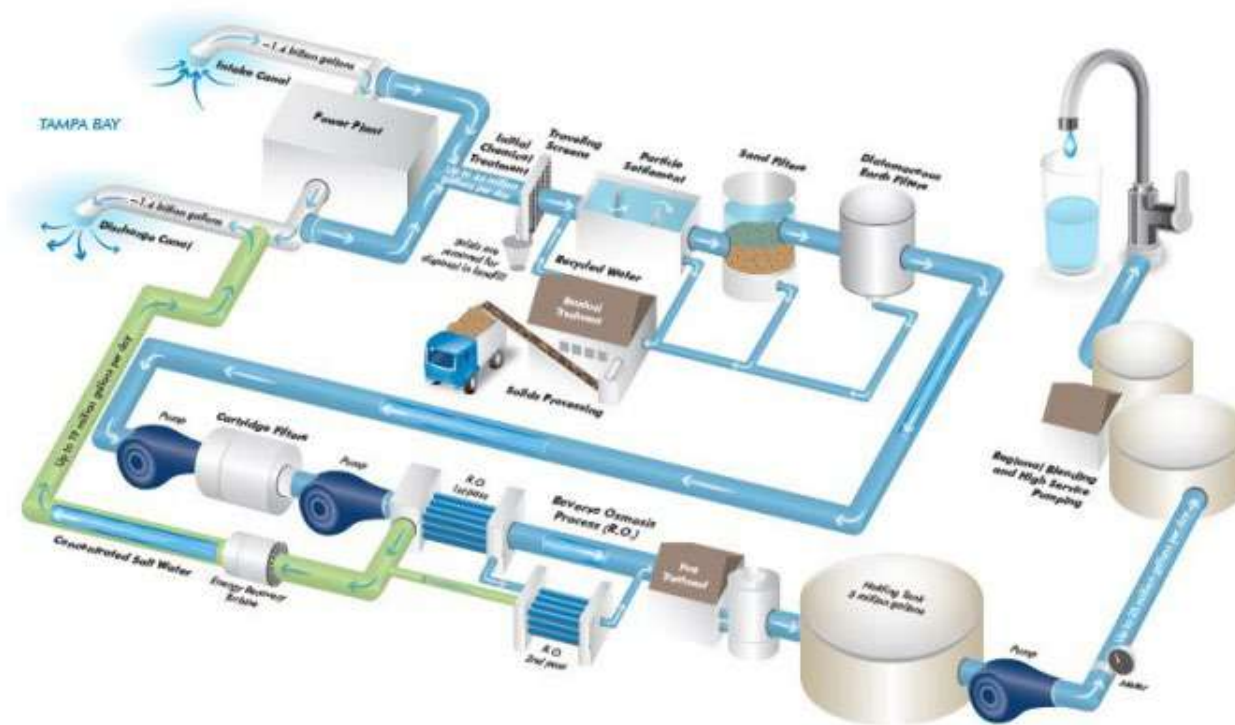


SEAWATER DESALINATION CATALOGUE

*over 60 years world leading manufacturer
of high quality valves and actuators...*

Valve Range for Seawater Desalination Applications



With the continuous improvement of the level of global industrialization, freshwater resources are increasingly scarce, and the lack of water resources has led to slow global industrial development. Desalination has become an important option for coastal cities to solve such problems. Valves are widely used in seawater desalination plants. As important control components in various processes, their selection and application are particularly important. The right valve can help seawater treatment plants build fluid pipelines to regulate water flow and increase production capacity.

In the process of seawater desalination, it is necessary to pay attention to the corrosion of chloride to equipment. Seawater temperature affects the corrosion rate, the higher the temperature, the faster the corrosion. Solid contaminants can damage the protective film of the material and cause erosion corrosion. Various chemical contaminants also increase the probability of corrosion. The addition of ingredients can also cause corrosion. Therefore, in seawater desalination, media with different degrees of corrosion will be encountered. We need to decide which style of valve to choose according to the processing technology.

Because seawater is highly corrosive, and seawater desalination requires uninterrupted and stable operation, corrosion resistance has become the main consideration. Valves used in seawater desalination mainly include nickel aluminum bronze, stainless steel, carbon steel, ductile iron, dual-phase steel, UPVC, CPVC and PVDF. Commonly used in seawater desalination are butterfly valves, ball valves, gate valves, globe valves, check valves and diaphragm valves.

Butterfly Valves

Butterfly valves are mainly used in the process of separating salt and water in seawater. The advantages of butterfly valves include convenient and rapid opening and closing, torque saving, small fluid resistance, and many styles, which can meet the needs of various processing processes. The body material, valve plate material and seal material of the butterfly valve can be replaced according to the requirements of the processing process. Such as replacing with duplex steel, nickel aluminum bronze and other materials that can withstand higher corrosion.

Ball Valves

Ball valves are mainly used for exhaust and dosing pipelines. The advantages of ball valves include good sealing performance, pressure resistance, corrosion resistance, and zero leakage. Due to the process of seawater desalination, there will be low-pressure pipelines and high-pressure pipelines. The ball valve can meet this demand. The ball valve has good pressure resistance and can withstand pressures up to Class 2500.

Gate Valve

Gate valve is a shut-off valve commonly used to circulate or block flow. The applicable pressure range and temperature range are relatively wide, and it will not be restricted by the flow direction, and the sealing performance is good.

Check Valves

Check Valve is a valve used to prevent backflow of media. Check valve can be divided into swing check valve, lift check valve, disc check valve and so on. It can prevent the reverse rotation of the pump and the motor and the leakage of the container medium.

If you have any needs for valves, welcome to consult us via sales@affco-flowcontrol.com. AFFCO will do our best to provide you with the right valve solution.

Plug Valve

A plug valve is an essential component in the seawater desalination process, where it is used to control the flow of seawater and other fluids throughout the system. Seawater desalination is a process that removes salt and other impurities from seawater to produce fresh water. The harsh nature of seawater makes it necessary to use valves that can withstand corrosion while ensuring reliability and efficiency.

Plunger Valve

A plunger valve is a type of control valve that can be highly effective in seawater desalination systems. It is designed to regulate the flow and pressure of seawater and other fluids, ensuring optimal performance throughout the desalination process. Given the corrosive nature of seawater, using a valve that is durable and resistant to corrosion is crucial.

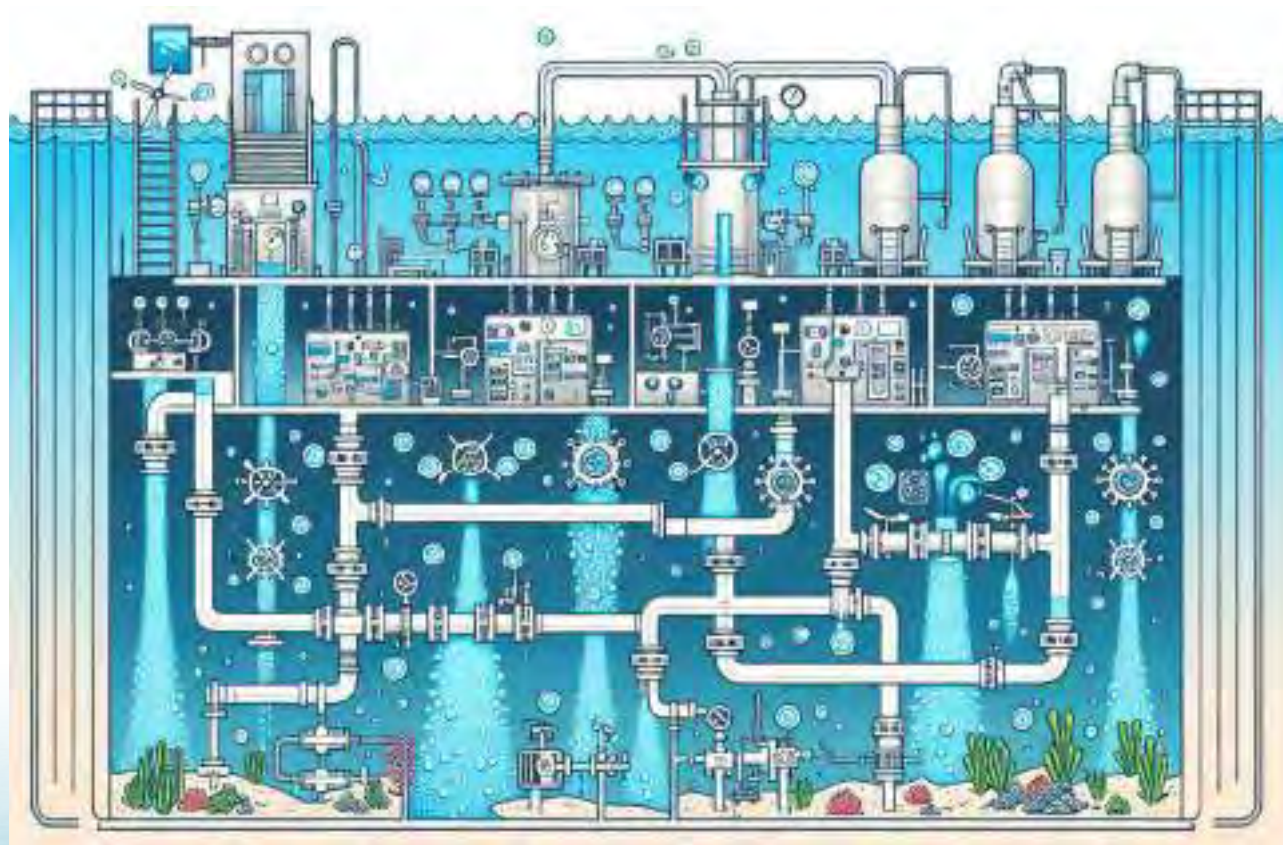
Air Valve

Air valves are crucial components in seawater desalination systems. They play a vital role in maintaining the operational integrity and efficiency of pipelines by managing the air within the system. Proper air management helps prevent issues such as vacuum formation, air pockets, and ensures system stability.

The most important thing in choosing a valve for desalination is to choose the appropriate valve material and pressure bearing capacity. At the same time, routine maintenance and regular replacement of wearing parts and erodible parts will help reduce the unit consumption of some seawater desalination and unnecessary downtime.

Applications

AFFCO valves play a crucial role in seawater desalination projects to ensure an effective and efficient operation of the system. Here are some of the key applications:



Intake and Discharge:

- Valves are used in the intake system to regulate the flow of seawater into the desalination plant, and in the discharge system to control the output of brine and treated water.

Pretreatment Process:

- This process often uses filtration systems to remove larger sediment and organic material. Valves help regulate the flow of water through these filters.

High-Pressure Pumping:

- In reverse osmosis systems, high-pressure pumps are used to force seawater through the semi-permeable membrane. The flow and pressure are controlled by valves.

Membrane Systems:

- Valves are used to control the flow of water through the reverse osmosis membranes, and to isolate sections of the system for maintenance or in the event of a failure.

Chemical Dosing:

- Chemical dosing systems, which add chemicals to improve desalination and prevent membrane fouling, require precise control, typically provided by dosing control valves.

Energy Recovery Devices:

- These devices recover and reuse the pressure energy from the concentrate flow, and valves help to manage the flow and pressure.

Safety systems:

- Valves are also used in safety systems, such as pressure relief and emergency shutdown systems, to protect the plant and its components in critical situations.

Special Coating for Seawater Desalination

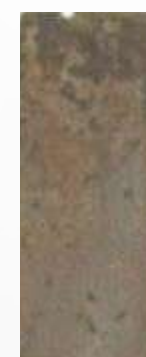
Halar coating covered valve disc

- Very good performance to chemical and thermal resistance
- Limit biological growth in the application
- Meet requirement for food and drinking water to NSF/KIWA
- standard
- Good performance to resist chloridion-corrosion
- Good performance to resist impact
- Suitable for Chloridion concentration upto 0.04

Nylon 11 coating covered disc

- Less Expensive Alternative to Nickel Aluminum ,Bronze and Duplex Stainless Steel
- Excellent Corrosion Resistance
- Excellent Impact and Abrasion Resistance
- Proven in Seawater Service
- No Corrosion After 20 Years Exposure
- Excellent in Salt Spray Environments
- No Corrosion After 2000 Hours Exposure

Phosphatized Steel



Halar/ Nylon 11 Coated



Marine Epoxy Coated

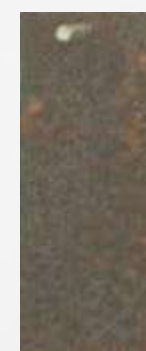


ENP Coated



Halar/ Nylon 11 coating vs. Other Coatings (18 Month Salt Water Emersion)

Bare Metal



Epoxy Coated



EnamelCoated



Polyester Coated



Products



Actuator



Butterfly Valve



Ball Valve



Air Valve



Gate Valve



Plunger Valve



Plug Valve



Check Valve

Concentric Butterfly Valve

■ Design Feature

AFFCO valve supplies a full range of butterfly valves, Compact design and streamlined disc design a high Kv/Cv values, low pressure loss and energy cost. The vulcanised bonded liner for longer lifetime, no corrosion between body and liner. Because of the limited number of parts our valves are maintenance friendly and easy in use.

Top Flange

- According ISO 5211

Shaft

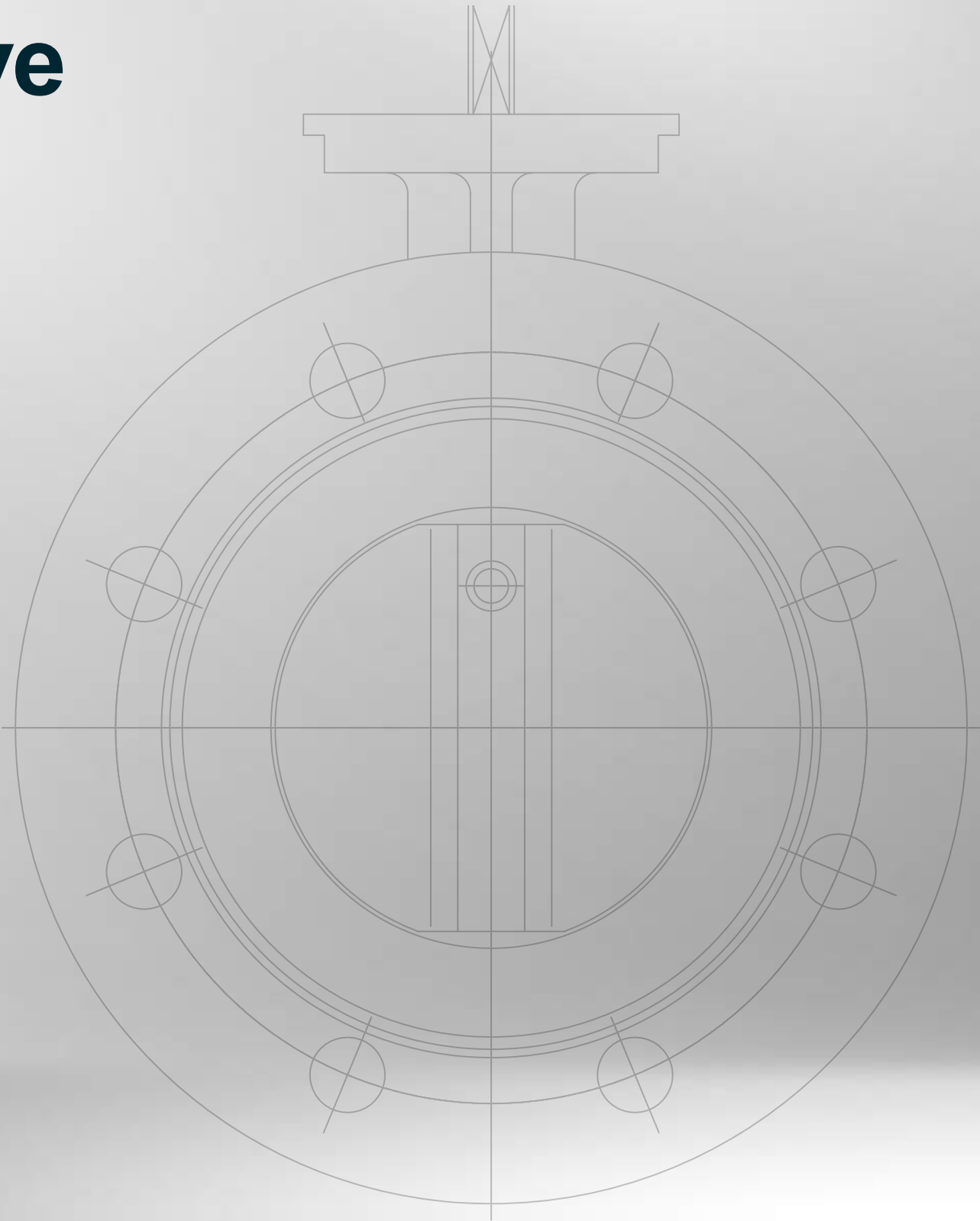
- Centric one piece shaft system, 100% bi-directional tight shut off

Valve Body

- Minimum GGG40 body
- Available in several materials

Support bearing

- Extra support bearing for lower valve torque



Disc

- Streamlined centric disc to reduce pressure loss and lower energy costs available in several materials

Bearing bush

- Bronze bearing bush vulcanised to the liner
- No use of O-ring on the shaft

Liner

Vulcanised Lining bonded to the body, no corrosion between valve body and liner for:

- Suitable for dry conditions
- Longer life time
- For end of line service
- Low torque

Pin

- Cylindrical pin

Stop plug

- To seal bottom side of the valve and to guide stem/shaft

AWWA Butterfly Valve

■ Double Eccentric Design

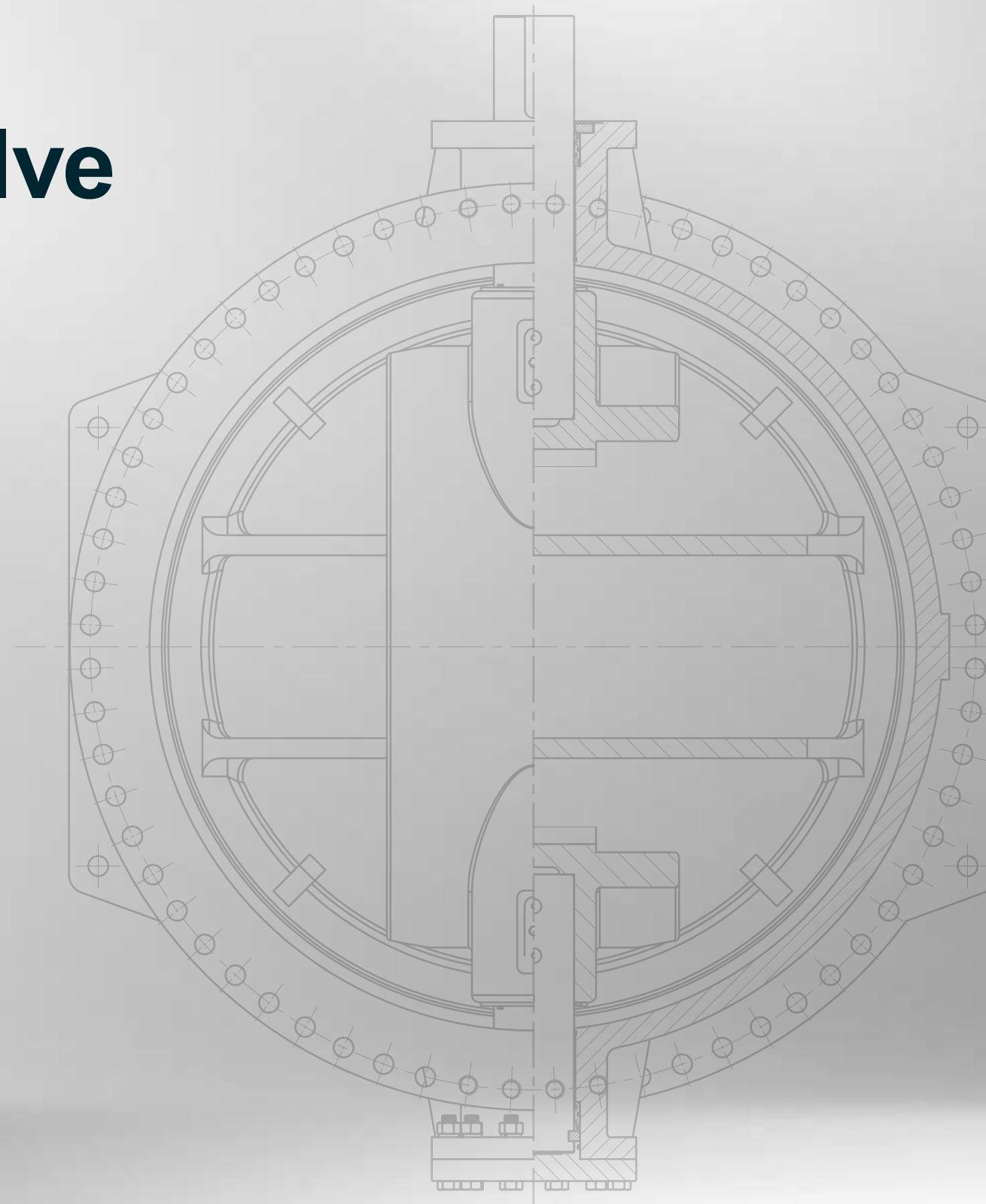
The stem of disc rotation is horizontally and vertically offset from the body seat. This high performance design eliminates the friction and compression between disc and seat while the valve is in the open position. Compression on the seal is released after only a few degrees of opening.

■ High Working Pressure

ASTM A536 65-45-12 Ductile Iron body and patent seat construction make the valve suitable for pressure from vacuum to 40 bar.

■ Drinking Water Safe

WRAS approved rubber and NSF 61 approved coating for use in potable water systems.



■ Dry Shaft Design

Full AWWA C504/C516 diameter stub shafts remain dry through multiple O-ring seals on both the upper and lower shafts. This prevents corrosion inside the stem hole and avoids shaft clogging.

■ Certified Zero Leakage

AFFCO valve is tested in accordance with AWWA C504/C516, test certificate for each valve is included. The certificate includes a leak test report, torque test record, and heat number trace of the valve components.

■ Ease of Maintenance

The valve design requires zero to minimal maintenance. Seal ring replacement can be achieved without dismantling other parts of the valve except seal ring retainer.

■ Actuator inversion

The upper flange is equivalent to lower flange. The actuator can be discharged and be installed to lower flange when it is required.

High Performance Double Eccentric Butterfly Valve

■ Design Feature

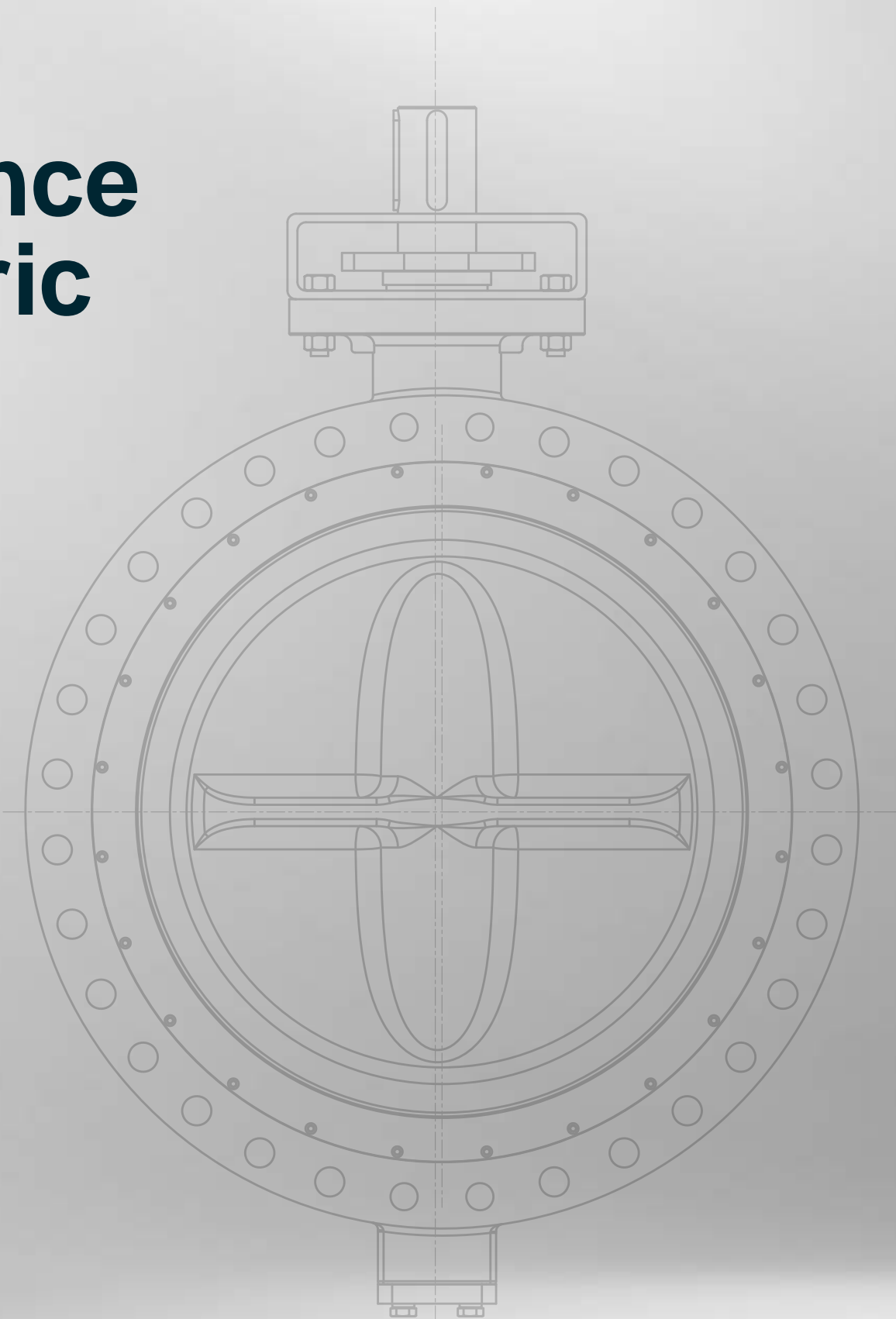
AFFCO valve, High Performance double eccentric butterfly valves are engineered to meet the standard requirements of most project specifications, and a range of additional features and options make our valves suitable for even the most severe conditions. Low torque enables the most cost-effective actuation operations, all AFFCO High Performance valve models have been cycle tested to ensure good seating performance even after 100,000-200,000 times open and close.

**Accordance with industrial standard
API/EN/ANSI/JIS/GB**

**Over travel limits design for disc
position**

Wafer, Lug and flange versions

**Bottom split ring positioning and
blow-out proof design**



Bidirectional sealing design

Elastic metal seat design, zero leak tightness testing more than 10000 times

Top flange according to ISO5211, directly for mounting actuators

Double eccentric design reduces wearing on the seat and ensures bidirectional sealing under rated pressure range

Ultra high machining accuracy and elastic seat design ensures lower torque value

Fire safe design of superior performance prolongs service life, conforms to the requirements of the fire test standards

Clamp backing pin design, reliability and easy maintenance

A wild range of applications from vaccum to ultra high pressure service, and from low to ultra high temperature service. Suitable for severe process

Triple Eccentric Butterfly Valve

■ Structural Features

AFFCO valve, triple eccentric butterfly valves are engineered to meet the standard requirements of most project specifications and a range of additional features and options make our valves suitable for even the most severe conditions. Low torque enables the most costeffective actuation operations.

All AFFCO triple eccentric butterfly valve models have been cycle tested to ensure good seating performance even after 100,000-200,000 times open and close.

- Zero leakage in accordance with API598
- Full pressure bi-directional sealing
- Inherent fire safe design
- Rotate with no friction
- Low torque and on-off with no wear lead to long life
- Quick shut-off
- Suitable for flow regulation
- Multiple materials available
- Fugitive emmision available
- Interchangeable seat and seat ring



■ THE CONCEPT

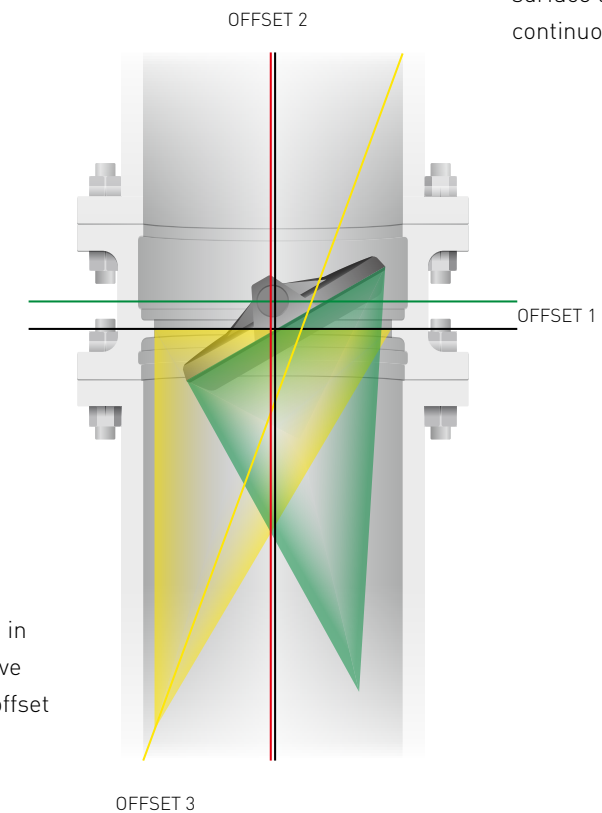
AFFCO TRIPLE ECCENTRIC BUTTERFLY VALVE

OFFSET 2

Shaft is placed to one side of the pipe/valve centerline to allow the displacement of the seal from seat during 90° opening.

OFFSET 1

Shaft is placed behind the plane of the sealing surface to provide a continuous seat path.



OFFSET 3

Seat and seal cone centerline are inclined in respect to the pipe/valve centerline. This third offset completely eliminates rubbing.



Ball Valve

■ **Design Feature**

AFFCO valve, ball valve range plays a critical role in isolation service across hundreds of installations. The range can be engineered to suit your application, with body construction, material, and ancillary features optimised to meet your process needs. With API6D certification in place across the range, you can be assured of outstanding reliability and sealing performance through design life of your asset.

Stem

- Stem blowout proof design
- With anti-static device

Support

- Only for trunnion mounted ball valve

Grease Injector

- Only for trunnion mounted ball valve seat and stem part
- Available in SS materials

Lip Seal Design Available

Top Flange

- According ISO 5211

Valve Body

- Available in several materials

Ball

- Quarter-turn rotary motion with enough strength
- Available in several materials

Seat

- Self relief valve soft seat
- Fire-proof design
- Suitable sealing size,longer service life
- Available in several materials

Gate Valve

Design Feature

AFFCO valve, gate valve range plays a critical role in isolation service across hundreds of installations. The range can be engineered to suit your application, with body construction, material and ancillary features optimised to meet your process needs. With API600 certification in place across the range, you can be assured of outstanding reliability and sealing performance through design life of your asset.

Structure

- Bolted bonnet, rising stem, wedged single disc, metal sealing surface

Gate

- Flexible wedge gate for larger size, solid wedge gate for smaller size

Back Seating Design

Seat

- Spray welded with hard alloy specified by the customer

Packing

- Flexible graphite, reliable sealing performance

Stem

- Integral forged design
- T type connection with gate

Stem Nut

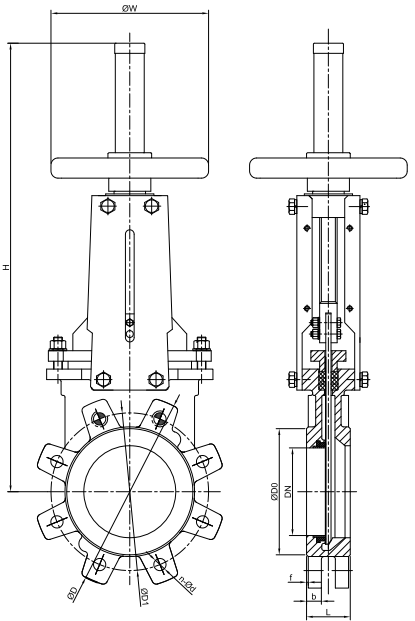
- Copper alloy material for torque reduce



Knife Gate Valve

Flange Type Series 207

Design Standard	MSS-SP-81
Nominal Diameter	DN50-DN600 (2"-24")
Flange Connection	ASME B16.5
Face to Face acc	MSS-SP-81
Test STD	MSS-SP-151



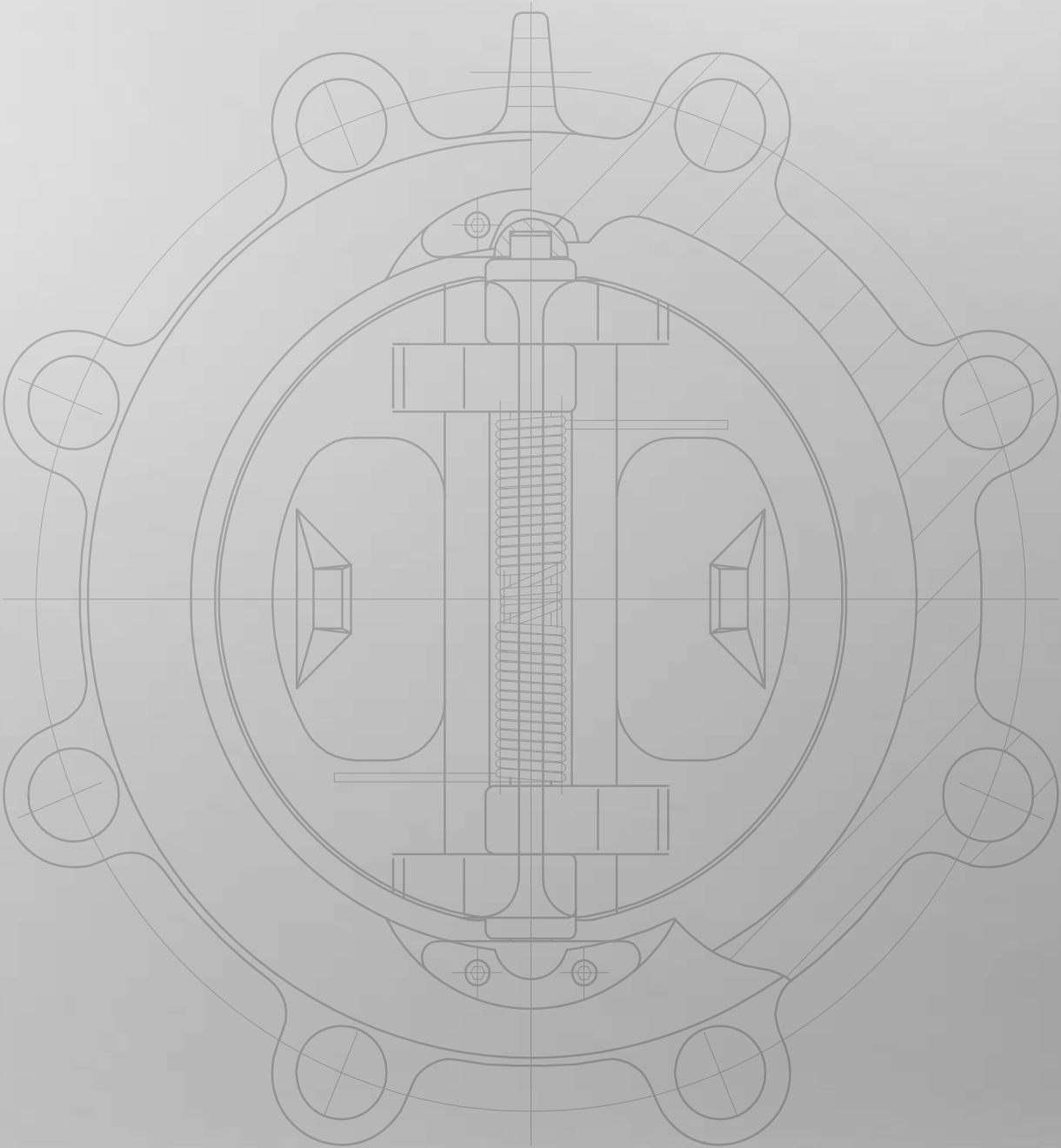
Dimensions

DN	L	D1	nxd	D	D0	b	f	H	W
50	40	125	4×19	165	99	16	2	375	180
65	40	145	4×19	185	118	16	2	420	180
80	50	160	8×19	200	132	17	2	450	200
100	50	180	8×19	220	156	17	2	512	200
125	50	210	8×19	250	184	17	2	570	220
150	60	240	8×23	285	211	21	2	665	250
200	60	295	8×23	340	266	21	2	825	300
250	70	350	12×23	395	319	24	2	1000	350
300	70	400	12×23	445	370	24	2	1155	350
350	96	460	16×23	505	429	33	2	1310	400
400	100	515	16×28	565	480	35	2	1475	500
450	106	565	20×28	615	548	30	2	1630	600
500	110	620	20×28	670	609	31.5	2	—	600
600	110	725	20×31	780	720	36	2	—	600

Check Valve

■ Design Feature

AFFCO valve, check valve range plays a critical role in isolation service across hundreds of installations. The range can be engineered to suit your application, with body construction, material and ancillary features optimised to meet your process needs. You can be assured of outstanding reliability and sealing performance through the design life of your asset.



Structure

- Swing check, Pistion check, Dual plate check
- Bolted bonnet, swing and lift disc, metallic sealing surfaces

Seat

- Spray welded with hard alloy specified by the customer

Material

- CS/SS/DS/Bronze material is available

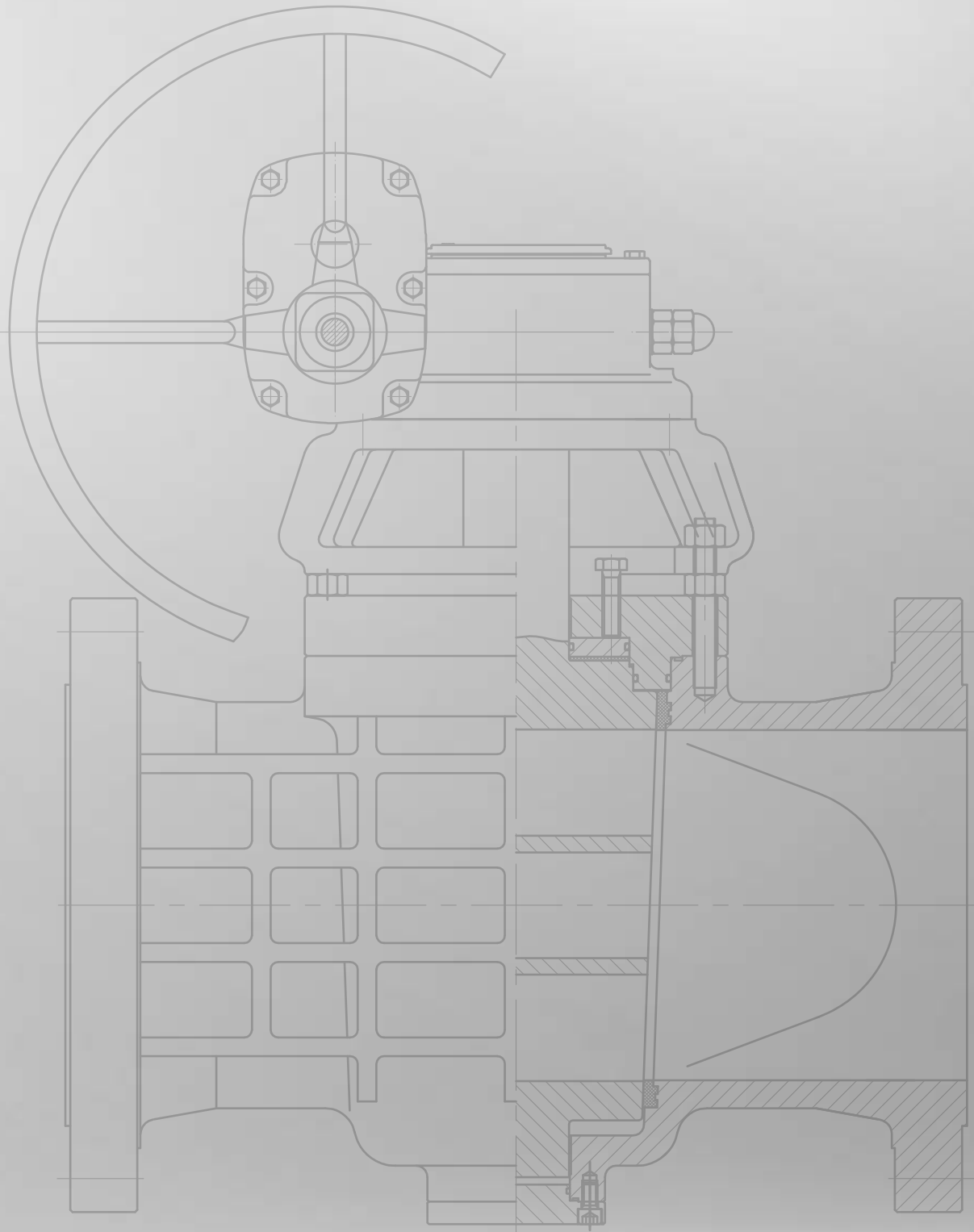
Connection

- For dual plate check valve, wafer/lug/ double flange type is available

Plug Valve

■ Design Feature

The AFFCO valve, plug valve family plays a key role in isolating and diverting services for hundreds of installations. The range can be designed for your application and its body structure, materials and auxiliary functions can be optimized to meet your process needs. With API599 certification, you can ensure excellent reliability and sealing performance throughout the design life of your equipment.



Structure

- Bolted bonnet, cock, PTFE soft seat.

Packing

- Flexible graphite, reliable sealing performance.

Gate

- The valve plug can be cylindrical or conical in shape.

Stem

- As one with the cock, it can adapt to different driving forms according to different joint forms.

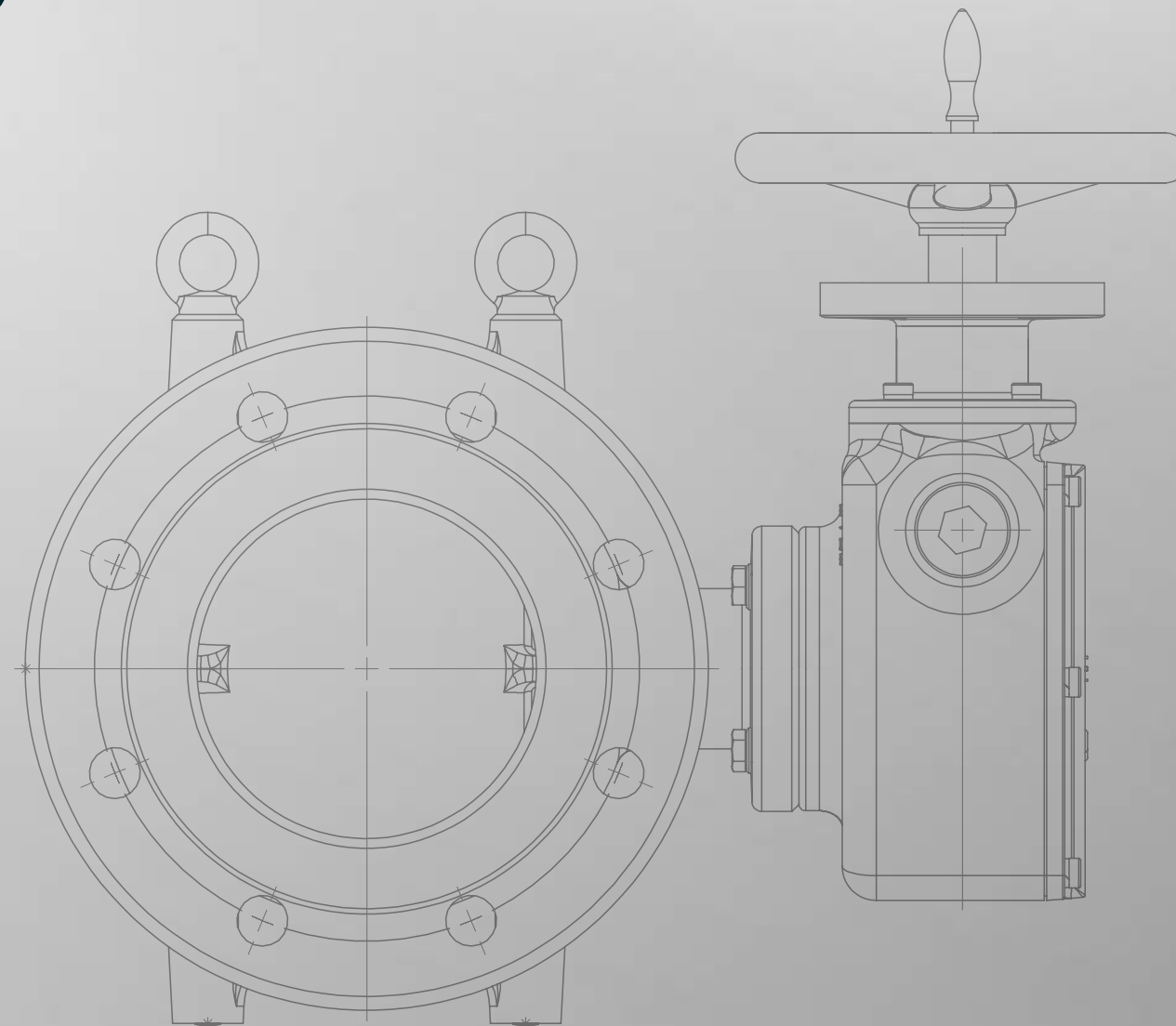
Seat

- Soft seal valve seat.

Plunger Valve

■ Design Feature

- One-piece body construction
 - T-shape main seal located in safety flow area ensuring minimal wear and long service life
 - Maintenance access is conveniently provided by the downstream retaining ring and the upstream cover being attached with screws
 - Low operating torque due to pressure balance in chamber inside
 - Gearbox with handwheel for ON/OFF operation
 - Low head loss coefficient in fully open position due to optimized internal body shape
-



-
- Double O-ring sealed drive shaft with all other shafts and bearings protected against corrosion with O-ring combinations
 - 4 guide rails ensure no vibration during operation and accurate alignment throughout full valve stroke
 - Body in ductile iron with internal parts in stainless steel and bronze guide rails for high corrosion resistance
 - Internally and externally corrosion protected with a coating of blue RAL 5017 fusion bonded epoxy to DIN 3476 and applied in a GSK approved process.
-

Air Valve

Overview

Air valve is a special hydromechanical flow control device whose function on a pipeline is to release accumulated air poclets or admit air into the pipeline during the filling, draining, or operation of water systems.

AFFCO air valves provide protection from transient pressures and entrapped air in pipelines, which are the main causes of bursting, collapsing, and fracturing of pipelines. AFFCO air valves can contribute to the improvement of the efficiency of the water system.

Technical Information

Size range:	DN 25-300MM
Pressure ratings:	1 .0Mpa, 1 .6Mpa(Thread) 1 .0Mpa, 1 .6Mpa(Thread)
Working temperature:	-10° - 80°C
Flow media:	clean water

■ Large volume of air release during filling of the pipeline.

■ Small air release under pressurized pipeline.

■ Large volume of air intake during draining of the pipeline.



S838

S837

Features

- Advanced design with simple mechanism, strong float to prevent cracking during sudden water hammer& quick closure .
- Aerokinetic mechanism to resist blow shut under higher air velocity even up to sonic velocity of air.
- No arms or levers to prevent vibrating, bending, direct closure of the float.
- Smooth cage outside of the float, keeping float moving along specified guide rail.
- Bottom rubber buffer for collision prevention, and drain easily with proper holes around the cage during vacuum.
- Outside screen is an option for safety and blocking insects or birds out.
- Fully fusion epoxy coated inside and outside of valve body for long term services.
- Manufacturing standard meets BS EN 1074-4, AWWA C512
- Flange drilling and dimension meets BS EN 1092 and BS EN 558 and ANSI flange.



Hand Lever

Two series of levers are suitable for AFFCO butterfly valves from DN40 up to DN300, for open&close or regulation in 8 or 10 positions, ductile iron GGG40 powder coated, and notch plate steel galvanized.

Gearbox

Temperature range:-25°C to +110°C

“AMQ” series is manufactured in cast iron housing& components. Padlocking devices, memory stop, spur gears and limit switchboxes can be easily mounted on site without any machining, due to the integration of all necessary connections on the housing. This series is IP68 sealing.



“AMQ-SS” series is produced with stainless steel 316 housing and components, applicable with padlocking devices, limitswitchboxes and memory stops. It is IP68 sealing, specially applicable for high corrosive environments.



“AMQ-X” series is light with aluminium alloy body& coverplate, IP67 sealing for waterwork.



MOD series is declutchable gearbox to provide 90° manual operation for shut-off valves equipped with a pneumatic or hydraulic actuator.



Pneumatic Actuator

PMA Series Rack and Pinion Pneumatic Actuators are with out-put troque from 4.3 to 4,678.6 NM;

- Both double acting and spring return types are available.
- Aluminum alloy, carbon steel and stainless steel materials available as options.



AFFCO underwater actuator solution:

- PMA SS series, with stainless steel material.
- IP Degree: IP68
- Standard: DIN EN ISO5211
- Applicable to salt water, oxygen-rich water.

PMAS/C series are Scotch Yoke Pneumatic Actuators



- PMAS series are symmetric scotch yoke actuators, with double acting type’s out-put torque from 908 NM to 309,276NM, and spring return type’s out-put torque from 495 to 233,891NM.
- PMAC series are canted scotch yoke actuators, with double acting out-put torque from 908 to 386,594NM, and spring return type’s out-put torque from 452 to 302,163 NM.
- Body material:SG Iron, aluminum alloy.
- Temperature options: Low(-40°C); Standard(-20~80°C); High temperature(Up to 150°C).