

TOD

Triple Offset Valve



Perfect Harmony with Technology



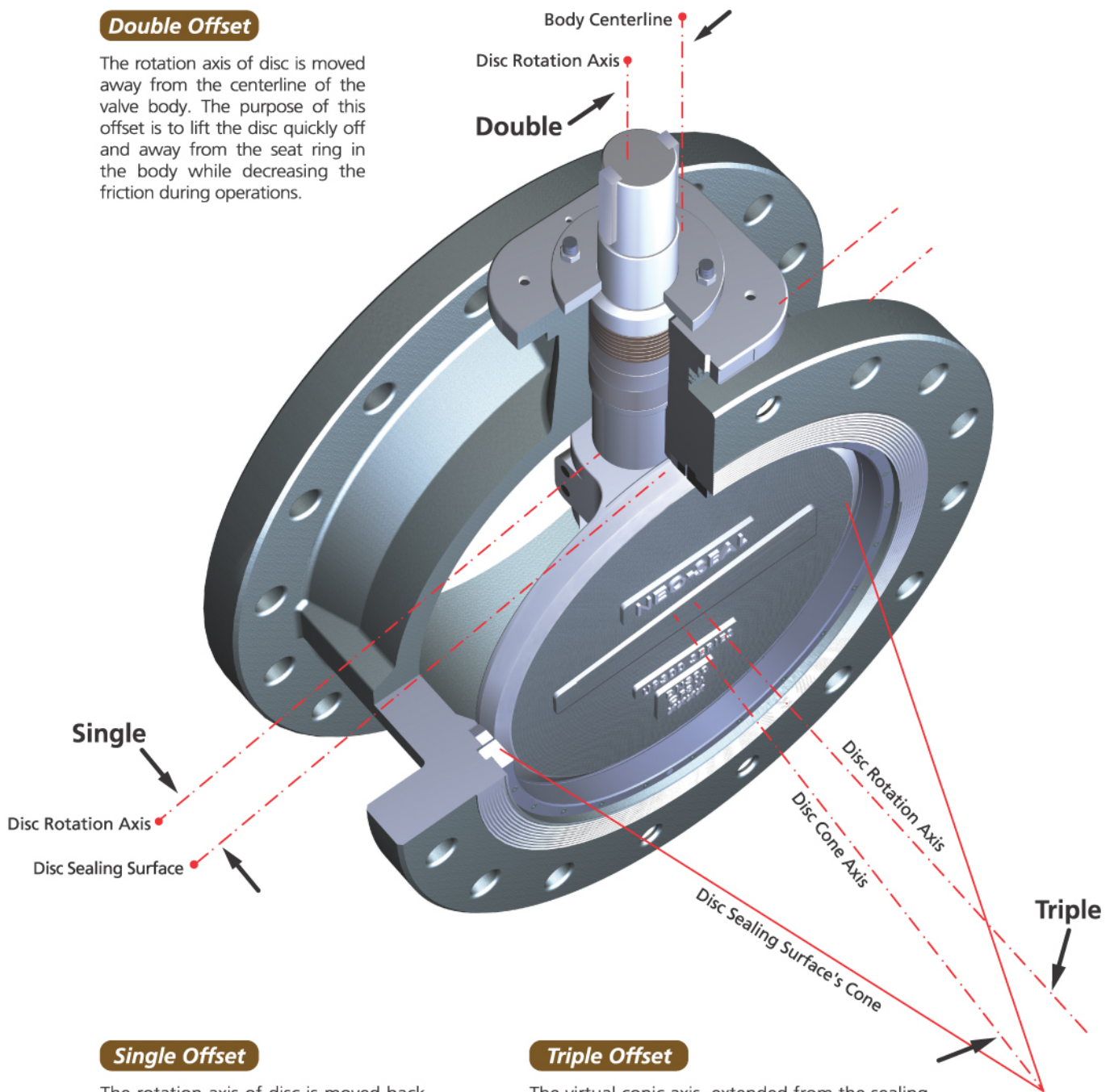
TRIPLE OFFSET METAL SEATED VALVES

About Triple Offset Valve

It is generally known that there exist many problems with the design of double offset metal seat in terms of its long service life for the bubble tight shut-off mechanism. In order to overcome those problems, Unicom is now introducing triple offset metal seated valves. It features a special sealing mechanism, which consists of contacts of an inclined and conical disc with a laminated seat. In result, the friction and abrasion between sealing elements (disc and seat) are minimized. The most unique feature of this design is that it can provide low torque, broad sealing width and bi-directional tight shut-off.

Double Offset

The rotation axis of disc is moved away from the centerline of the valve body. The purpose of this offset is to lift the disc quickly off and away from the seat ring in the body while decreasing the friction during operations.



Single Offset

The rotation axis of disc is moved back from the sealing surfaces of disc. The purpose of this offset is to have a continuous sealing surface on the disc.

Triple Offset

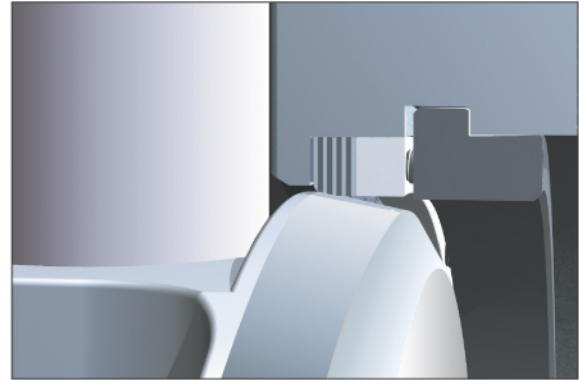
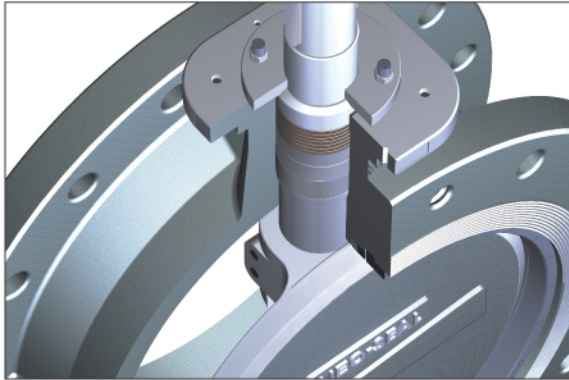
The virtual conic axis, extended from the sealing surfaces of disc is inclined from the rotation axis of disc. The purpose of this offset is to eliminate friction, galling and wear generated at the sealing surface during operations and provide bubble tight shut-off on high pressure and temperature.



SEALING SYSTEM

Principle of Sealing System

Most of metal seats in double offset design are designed for sealing with a mechanism, which depresses the smooth side of the metal seat between the sealing elements (disc and seat). This type of mechanism, by using sudden torque, can cause galling and scratches on the sealing elements. It can possibly cause jamming between the sealing elements, which can lead to a malfunction of a valve. This is where triple offset valves are superior to double offset design valves.

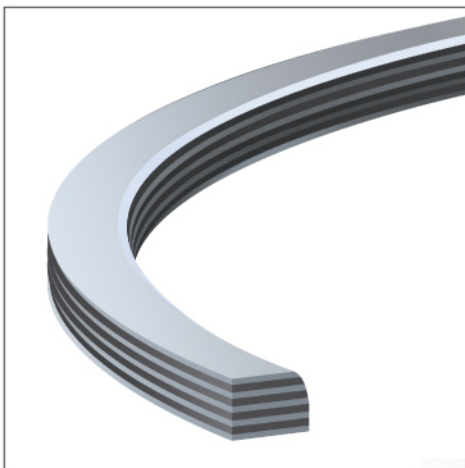


- ❖ The sealing surfaces of a TOD valve disc have different angles in all points that a TOD valve has an elliptical sealing system.
- ❖ The sealing surfaces of an elliptical sealing system are completely in contact at the final position and, upon opening, all contact points are deviated from the seat ring.
- ❖ This mechanism solves the problems of double offset design and provides flawless bubble tight shut-off.
- ❖ Unlike conventional valve designs, the seat ring is fixed in the body with set screws along with a retaining ring, which is mated with the thrust collar. Therefore, the seat ring is not directly influenced by fluid in open positions.



LAMINATED SEAT RING

The laminated seat ring is composed of alternating layers of metal and graphite.



- ❖ The layers of graphite compensate for the lack of smooth mating surfaces. The laminated seat ring of a TOD valve provides bubble tight shut-off even in gas application.
- ❖ Each individual layer performs as an independent sealing and it is unaffected by the damages of other layer.
- ❖ The elements of laminated metal plate can be substituted to various materials, including inconel, monel and hastelloy depending on the application.
- ❖ Additionally, for high temperature and more severe applications, the solid metal seat ring is available and, for low temperature applications, the solid metal seat ring can be substituted to PTFE/R.TFE seat ring.



FEATURES

- Metal to metal sealing.
- Bi-directional tight shut-off.
/ Achieved by introducing triple offset sealing technology.
- Triple offset design with inclined conical sealing system.
/ Eliminates rubbing and jamming associated with sealing surface contact.
- Laminated metal or solid metal seat.
- No fasteners on disc, one piece structure.
- Provides the non-friction motion.
- Robust single-piece shaft.



- Efficient operation with worm gear, electric, pneumatic or hydraulic actuators.
- Inherently fire safety design.
- Prolongs the service life by the replaceable seat ring structure.
/ Field repairable.
- Availability for various applications.
/ Available in a wide range of materials including special alloys capable of resisting corrosion.
- Provides low operating torque.
- Provides durable, wide temperature range.



PRODUCTS



32inch ANSI CL.600
with electric actuator



6inch ANSI CL.900
with pneumatic actuator



8inch ANSI CL.150
with manual worm gear



8inch ANSI CL.150
with manual worm gear

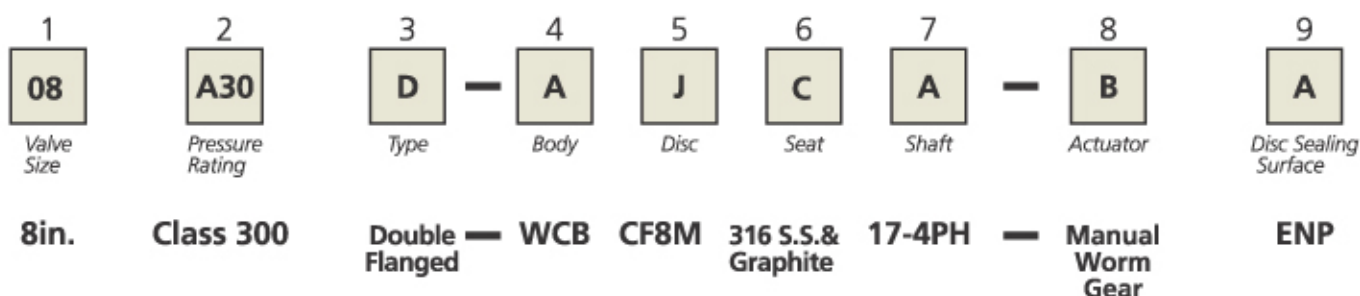


APPLICATIONS IN MAJOR INDUSTRIES

- Petrochemical Plants
- Oil Production(On / Off shore Platforms)
- Power Plants(Hydroelectric / Nuclear)
- Oil Refinery
- Plant Engineering (LPG / LNG Storage and Transportation)
- Gas Industry
- Pulp Industry
- Steel Mills
- Paper Industry
- Ship Building
- District Heating(Transportation / Generating)
- General Industrial
- Water / Sewage
- Chemical Plants
- Hydrocarbon Storage and Transportation
- Sugar Industry



GENERAL ORDERING INFORMATIONS



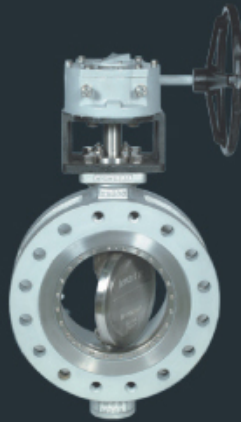
1 VALVE SIZE	
00	3in.(80mm) to 48in.(1200mm)
2 PRESSURE RATING	
A15	ANSI CL.150
A30	ANSI CL.300
A60	ANSI CL.600
A90	ANSI CL.900
P10	PN10
P16	PN16
P20	PN20
P40	PN40
P64	PN64
P100	PN100
3 VALVE TYPE	
B	Buttweld
D	Double Flanged
L	Lugged
W	Wafer

4/5 BODY & DISC			
A	WCB	N	Inconel
B	WCC	O	Duplex
C	LCB	P	Monel
D	LCC	Q	Hastelloy
E	LC9	R	Alloy20
F	CA15		
G	WC6		
H	CF8		
I	CF3		
J	CF8M		
K	CF3M		
L	CG8M		
M	CG3M		
		9 DISC SEALING SURFACE	
		A	ENP
		B	Stellite (H/F)

6 SEAT RING			
	LAMINATED		SOLID
A	304 S.S. & Graphite	L	304 S.S.
B	304L S.S. & Graphite	M	304L S.S.
C	316 S.S. & Graphite	N	316 S.S.
D	316L S.S. & Graphite	O	316L S.S.
E	317 S.S. & Graphite	P	317 S.S.
F	317L S.S. & Graphite	Q	317L S.S.
G	Inconel & Graphite	R	Inconel
H	Duplex & Graphite	S	Duplex
I	Monel & Graphite	T	Monel
J	Hastelloy & Graphite	U	Hastelloy
K	Alloy20 & Graphite	V	Alloy20
		W	PTFE
		X	R.TFE
7 SHAFT			
A	17-4PH	F	Hastelloy
B	Inconel	G	Alloy20
C	Duplex	H	Nitronic 50
D	Monel		
E	316 S.S.		

8 ACTUATOR	
A	Bare Shaft
B	Manual Worm Gear
C	Electric Actuator
D	Pneumatic Actuator
E	Hydraulic Actuator

For more information about TOD, please contact UNICOM



EXCEPTIONAL DESIGN
OPTIMUM PERFORMANCE
SUPERIOR QUALITY SYSTEM



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Cat. No. UNI-9000(Rev.2)
Printed in KOREA January 2008
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