



CVB VALVES S.R.L.  
VALVES MANUFACTURER

TRIPLE OFFSET BUTTERFLY  
VALVES QTV SERIES

# TRIPLE OFFSET BUTTERFLY VALVES QTV SERIES

- ***QTV SERIES***
- ***TRIPLE ECCENTRIC DISC***

CVB quarter turn metal seated rotary valves series with triple offset can operate in all the applications where

there are requirements either for temperature and pressure rates very high and corrosive fluids.

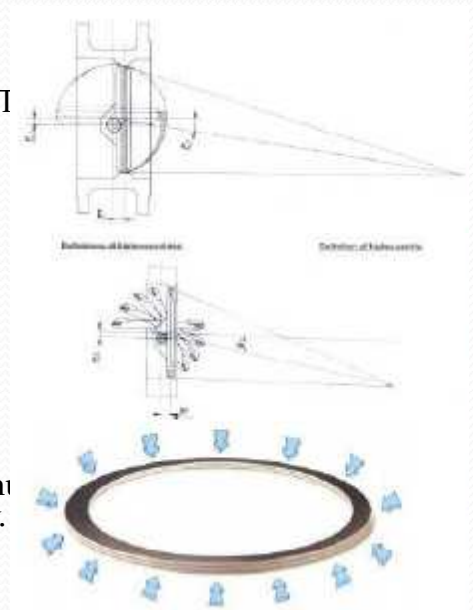
They present relevant advantages compared to other conventional valves as far as weight and ease to automate are concerned. Their utilization as either isolation and control valves ranges through different type of applications in the process lines : Petroleum ( Oil ) Industry - Off Shore, Refining, Storage and Transportation; Natural Gas- Off Shore, Treatment, Purification, Storage, Transportation; Chemical Plant - Process Applications. Utility steam; Pulp and Paper - Reduction Process, Steam; Power Plant - Low pressure steam, Central steam heating plants; Steel Mills - Hot gas.

Valve features and benefits:

- Metal seated—Zero leakage
- Resilient metallic seal No Rubbing Rotation Torque seated
- Bi-directional tight shutoff
- Anti Blowout shaft
- Size 3" - 72 " ND
- Inherently fire safe and fire tested
- ANSI B 16.5 Class 150—900
- Temperature range
- - 196 °C to + 815 °C .

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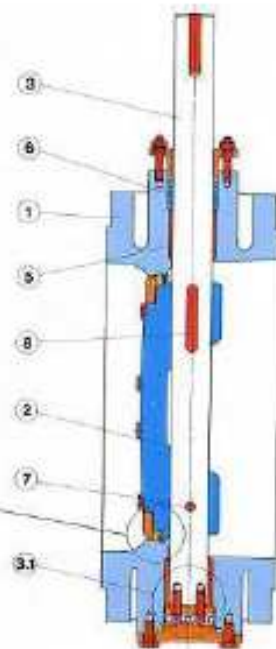
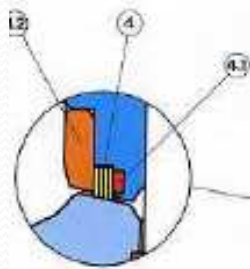
- In order to ensure bidirectional tight shut-off in a quarter turn valve design, unique valve geometry and innovative sealing principle, different from conventional valves, has been implemented. This design provides:
  - NO RUBBING ROTATION
  - TORQUE GENERATED RESILIENT SEAL
  - ADEQUATE WEDGING FOR UNIFORM SEAL CONTACT
  - To accomplish this revolutionary design the valve utilizes a triple offset, two related to the shaft position and the third one related to the conical seat to allow a camming action of the disc into the seat.
    - The seat shape is a truncated inclined cone which assures a continuous contact surface, even in the area
    - close to the shaft, where the majority of the valves start to leak.
    - The seal ring, secured but not locked in the disc, has radial freedom of movement. Presents, as the seat, an unimcline cone, and gains his first characteristic - flexibility.
    - The shut-off torque applied to the valve shaft is transferred to the seal ring which thanks to its flexibility and to its circular design maintains uniform contact on all the entire seat circumference.
    - The sealing forces generated by the torque uniformly compresses the seal ring into the seat all along the entire circumference. The compression makes the seal ring act as a spring or resilient metal seal.
    - This resiliency provides for zero-leakage shut-off in both directions and allows for the valve body and disc to expand or contract relative to each other without the risk of jamming while maintaining tight shut-off. It has a self-adjusting capability to the valve body deformations generated by pipe stresses. Behind the seal ring a spiralwound gasket prevents leakages around the seal ring.
    - Opening and closing cycles don't represent possible tightness problems as far as there aren't wearing and rubbing.



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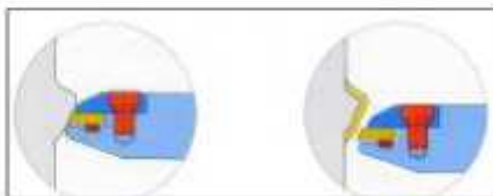
## VALVE DESIGN CHARACTERISTICS

- 1 - BODY
- 2 - DISC
- 3 - SHAFT
- 3.1 - THRUST BEARING DEVICE
- 4 - SEAL RING
- 4.1 - GASKET
- 4.2 - RETAINER
- 5 - BEARINGS
- 6 - STUFFING BOX PACKINGS
- 7 - TAPER PIN
- 8 - KEY



1. Valve Body - type double flanged ( DF ), Lug ( LG ), wafer ( WF ), butt welded( WE )
2. Disc - is used only to secure in place the seal ring ( 4 ), Gasket ( 4.1 ), seal retainer ( 4.2 ). Can be made of the same body material.
3. Shaft - one piece construction and extends completely through the valve disc and is connected to the disc through keys( 8 ) and pin ( 7 ) and secured by a bi-directional thrust bearing device ( 3.1 ) which absorbs thrust loads generated on the disc . The shaft being oversized to allow for the use of all the materials.
4. Seal Ring - Standard design is stainless steel/graphoil laminate . Other materials depending to the fluid type and/or seat material. Held in place by a retainer ( 4.2 ) bolted to the disc. The spiral wound gasket ( 4.1 ) avoids leakages below the seal ring.
5. Bearings –Oversized to house the large shaft and minimize contact pressures. Is made of hardened stainless steel, designed in a manner to minimize load and wear.
6. Packing –Precompressed and prepacked braided rings with graphite rings in the middle. Adjustable packing gland designed in such a manner as to prevent galling of the packing box in the event of unequal loading of the gland studs.

Double Flanged CVB Triple Offset Rotary Valve



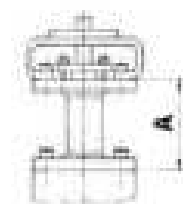
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## ● APPLICABLE STANDARD

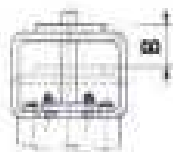
- Design: Calculation according to ASME SEC.VIII and IX-ASME SEC.III ANSI B16.34-ANSI B 31.1B31.3
- Face to Face : According to API 609, ANSI B 16.10, BS 5155, ISO 5752
- Flange Drilling: According to ANSI B 16.5 cl. 150 up to cl. 900  
MSS SP 44 for cl. 150 and cl. 300  
BS 3293 for cl. 150 and cl. 300  
UNI-DIN-ISO for cl. PN6 up to cl. PN 160
- Inspection and testing: According to API  
598 ( soft seated ) API 6  
D ( metal seated )  
ASTM FCI 70-2 cl.VI leakage  
MSS - SP 61  
Special testing on request
- Marking : MSS- SP 25
- Quality and Conformity System  
According to the European Pressure Equipment Directive 97/23 as per mod. H  
UNI EN ISO 9001: 2000  
Directive ATEX 94/92CE " ATEX "  
BS 5750 Part 1

### TEMPERATURE RANGE

From -196 °C to +700 °C ( -300 °F to +1292 °F ), by utilizing the appropriate materials. Depending on working temperatures QTV valves have different neck length with different design:



-48°C or to -196°C



280°C or to 420°C



420°C or to 700°C

- Standard type  
from -48 °C up to + 250 °C
- For temperature below A=180 mm.  
to -48 °C to -196 °C
- For temperature between +250 and +420° C  
DN 80 - DN 125      B= 80 mm.  
DN 150-DN 250      B=120 mm.  
DN 300 and above    B=180 mm.
- For temperature from +420 up to +700° C  
DN 80 - DN 300      C=170 mm.  
DN 250-DN 500      C=280 mm.  
DN 600 and above    C=350 mm.

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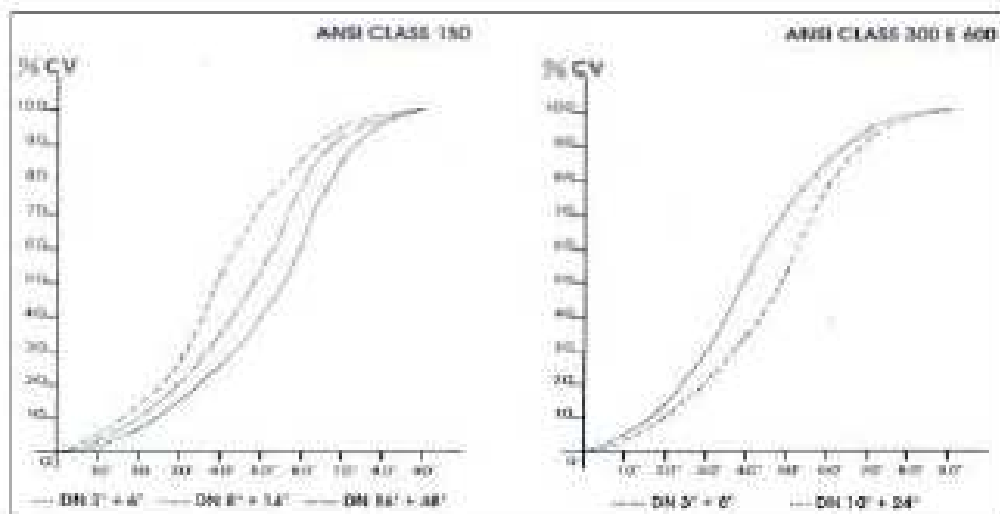
- DIFERRENT DESIGN

	 Basic configuration	 Cryogenic configuration	 High temperature configuration
 Double flanged short	X	X	X
 Double flanged long	X		
 Lug	X	X	X
 Wafer	X		
 Buttweld	X	X	
	 Class 1500	 Cryogenic buttweld top entry	 Mollen sail

# TRIPLE OFFSET BUTTERFLY VALVES QTV SERIES

- FLOW VALUES

FLOW COEFFICIENT CV



CV FLOW COEFFICIENT WITH VALVE OPEN AT 90°

VALVE DIAMETER/DIAMETRO VALVOLA									
CLASS	50-3"	80-3"	100-4"	150-6"	200-8"	250-10"	300-12"	350-14"	400-16"
150	90	150	250	750	1350	2200	3300	5100	7000
300	90	150	250	700	1250	2000	2970	4570	6300
600	-	130	250	600	1050	1700	2520	3900	5350

CV FLOW COEFFICIENT WITH VALVE OPEN AT 90°

CLASS	450-18"	600-20"	600-24"	700-28"	750-30"	900-32"	900-36"	1000-40"	1200-48"
150	9500	12500	19000	25000	31500	36000	45000	56000	51000
300	6750	11500	17500	-	-	-	-	-	-
600	7470	9520	14940	-	-	-	-	-	-

CV = flow rate of water in US gallons per minute, which passes through the valve causing a pressure drop of 1 psi at a temperature of 68 °F. In metric units KV= flow rate in m<sup>3</sup>/h, pressure drop of 1 bar, temp. 20 ° C.

La relationship between the two coefficients is CV= 1,17 KV

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