CAD

CLEAN & ASEPTIC DESIGN

USER FRIENDLY

BOTTOM TANK VALVES

RATTIINOX

ASEPTIC EQUIPMENT - DESIGN & SUPPLIER

CAD

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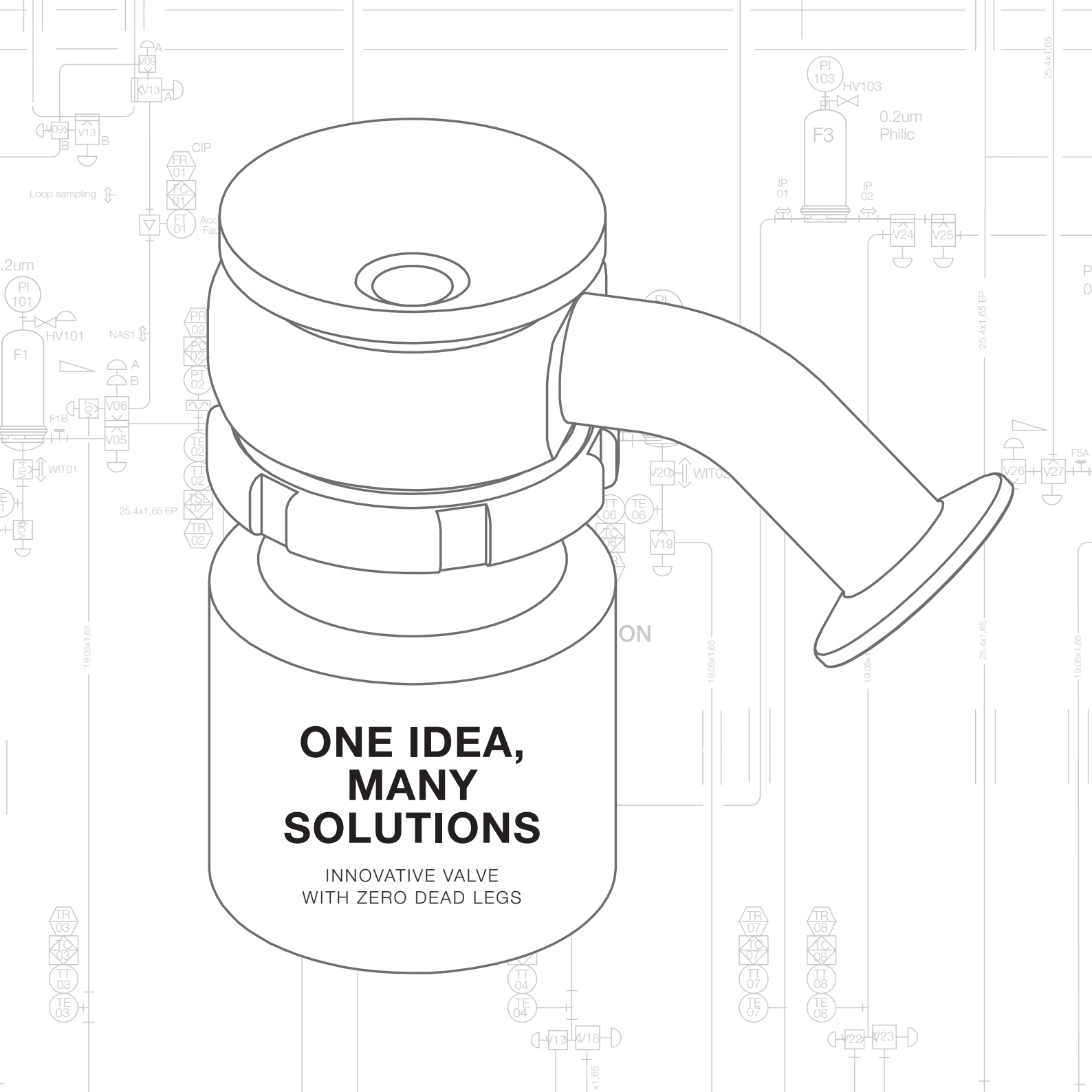
BOTTOM TANK VALVES


ONE IDEA,
MANY
SOLUTIONS
INNOVATIVE VALVE
WITH ZERO DEAD LEGS

INTRODUCTION

CAD Clean & Aseptic Design: **One idea, many solutions.**

The CAD valve range is the key tool to help you easily satisfy critical aseptic processing criteria. Frustrated with poor performing hygienic valves, aseptic process designers are asking for equipment to be able to fulfil the most stringent requirements of CIP and SIP. CAD valves are designed to answer these demands with properly designed process configurations upstream, downstream and around process vessels. The family of CAD valves offer designers a wide range of engineered solutions in order to realize compact designs, free of dead legs, with minimal solution hold up. Processing with CAD valves, which are constructed of 2 materials only: EN 1.4435-BN2 and PTFE USP Class VI-121°, will provide you an efficient process system, simple, reliable, and easy to validate. In addition, CAD valve diaphragms are also available in EPDM or Silicone, both USP and FDA validated.

CAD valves benefits:

- Optimized CIP-SIP Cycles
- No unused portions
- Flush flow design
- Easy process Validation
- Wide range of design possibilities to meet unique applications
- Extensive technical documentation for Validation

Valve design range: the CAD family valve range is extensive. Our specialists in process design will support you in selecting the appropriate type. We can also help you optimize your solution preparation system in order to achieve a design free of unused portion piping and zero dead legs, with minimal product hold up in a compact design with fast and effective CIP and SIP cycles.

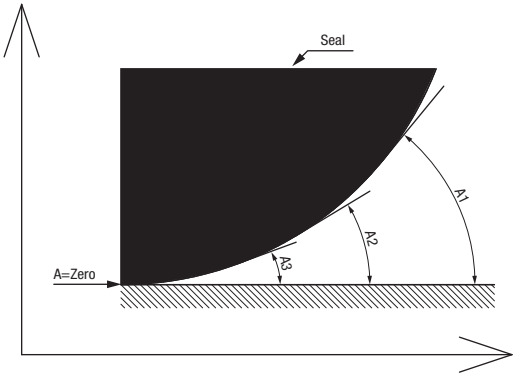
User Friendly - BTV is a collection engineered solutions to give designers and engineers an immediate answer for Bottom Tank Valves applications. Ready to work in one tool ready to use, fully equipped with diaphragms, actuators, sensors and additional connections able to satisfy all needs including certifications and documentation. Designed with Zero Dead legs, without Unused Portions and with flush flow seal. The body shape and their internal design offer a very reliable component for Aseptic Processing Applications. They fulfill all ASME-BPE requirements for todays stringent CIP-SIP activities.

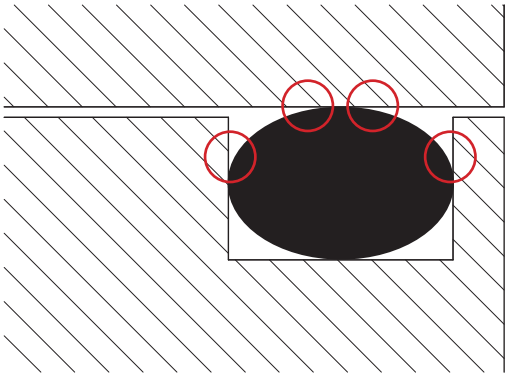
Tailored valves and valves assembly: if required, our specialists are able to quickly design, build and delivery special valves or assemblies.

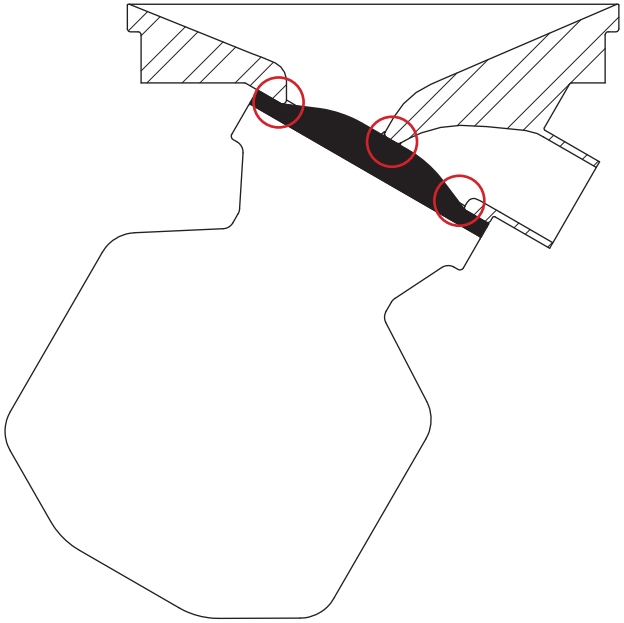
Support: this guideline will help you with the correct valve selection and suggest alternative solutions according to your needs. The goal is to improve general performance in terms of effective cleaning (CIP), sterilizations (SIP) and full drainability.
For additional information or support feel free to contact us at info@rattiinox.com or call the nearest Official CAD Distributor by looking at our website: **www.rattiinox.com/en/contact-us**

Features analysis: ASYMPTOTIC SEALS

Two main factors affecting aseptic processing are CIP (Cleaning In Place) and temperature distribution for an effective SIP (Sterilization In Place). To achieve efficient and effective cleaning in place, a turbulent flow is required.
The key point to achieving a turbulent flow is to avoid asymptotic closures.

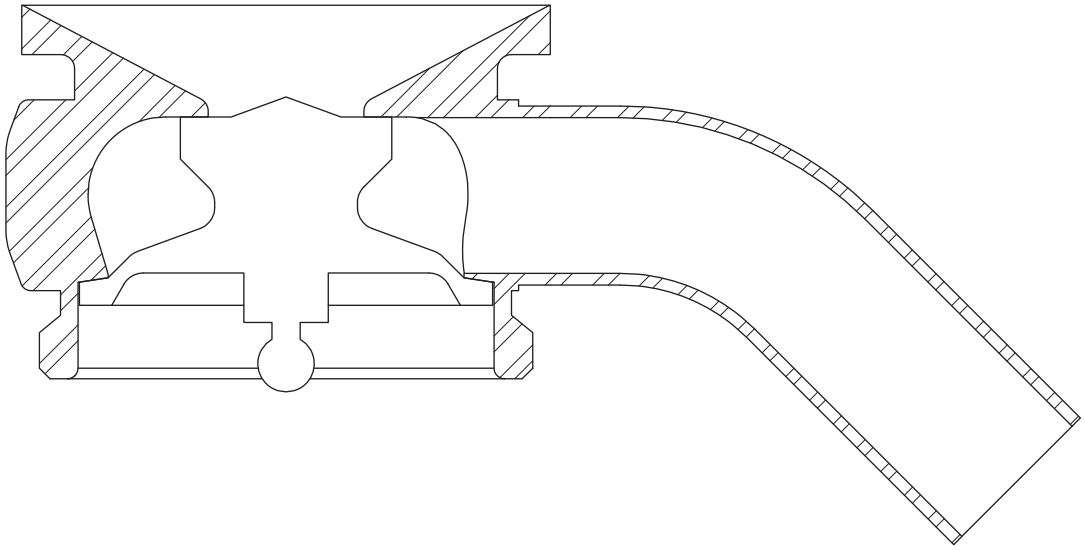






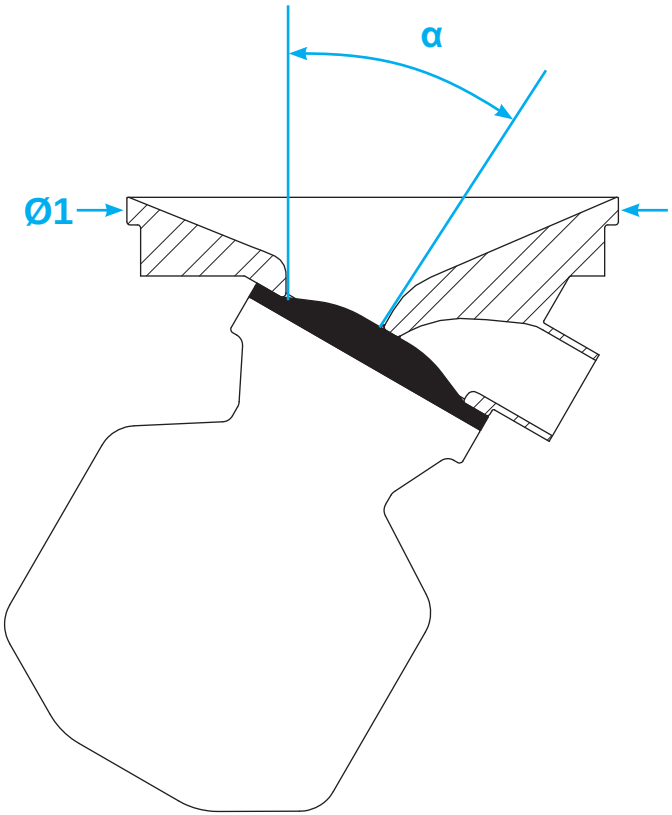
CAD design: FREE FROM ASYMPTOTIC SEALS

Bioprocessing professionals more than ever require equipment able to efficiently fulfil the stringent requirements of CIP and SIP. The flush flow internal design of the CAD Valve, which is free from asymptotic closures and dead legs, is a key tool enabling you to guarantee critical criteria are easily satisfied.



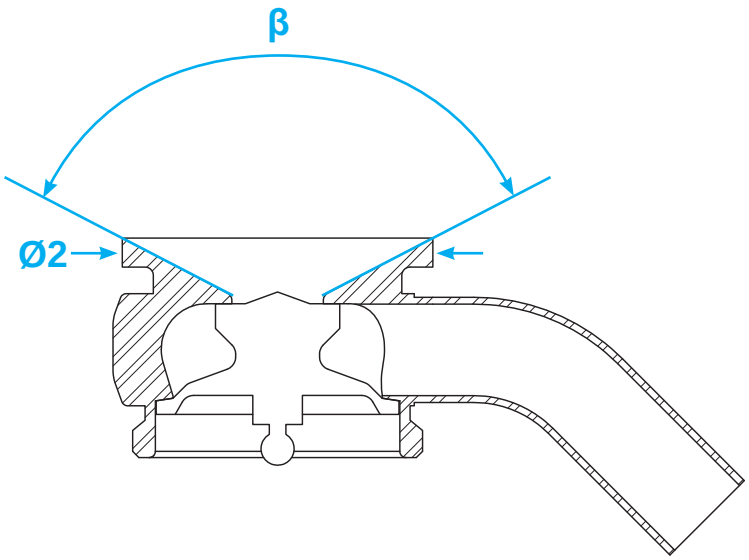
Features analysis: BODY DESIGN

Tank outlet valves of the weir design have significant limitations due to the fact that to achieve this application a larger diameter welding plate is needed **(Ø1)**. According to PED rules the thickness of the bottom dish needs to be increased to accommodate the larger cut out. In addition, the closure area has to be moved to a lower position to be able to accept the membrane sealing which results in a pocket on the internal side of the vessel **(α)**. This pocket makes homogeneous mixing problematic and typically not acceptable for bioreactors.



CAD design: SMALL AND OPEN WELDING PLATE

CAD SOLUTION. CAD Bottom Tank Valves have been designed to follow the most stringent requirements for pharmaceutical vessels. The welding plate diameter can be minimized, allowing designers to reduce the dish thickness as much as possible according to PED rules **(Ø2)**. Most importantly the closure area is positioned as close as possible to the internal side on the vessel without creating a pocket. In addition, the conical part of the valve inlet is open to the turbulence of the mixing unit reducing to a minimum the risk of deposits of suspensions in this area **(β)**.



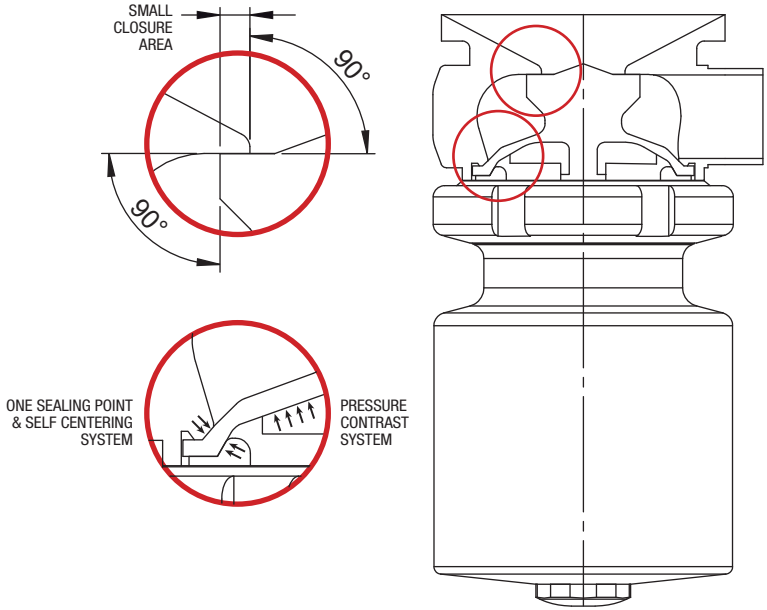
Features analysis: DIAPHRAGM

Weir-style EPDM+PTFE backing cushion membranes can have low resistance against vacuum resulting in a short life during SIP processes.

CAD valves were engineered from the beginning to address the most stringent requirements in terms of chemical compatibility and high temperature resistance. For this reason the CAD valve was developed at the outset with solid compound PTFE Diaphragms without an EPDM cushion. This design has proven advantages in diaphragm life, resistance to steam and overall chemical resistance. CAD diaphragms are also able to run under vacuum conditions, required to speed-up drying processes after SIP cycles. The engineered self-centering system allows the possibility to disassemble and reassemble the same diaphragm for inspection purposes, avoiding leakage at sealing points, typical of other PTFE diaphragms. In addition, CAD valve diaphragms are also available in EPDM or Silicone, both USP and FDA validated.

Example of conventional design

CAD design




Quick change system
Stainless steel support
PTFE USP Class VI-121°C
Precision machined


Silicone


EPDM

ACTUATORS

The most stringent demands in aseptic processing typically require the use of stainless steel and PTFE due to almost universal compatibility. During external cleaning process, plastic handles can be damaged. Plastic pneumatic actuators are large compared to what is possible with a stainless actuator. During SIP operations the heat can compromise the functionality of these systems. Also position detecting sensors on actuators made of plastics have limited operating range in terms of temperature resistance.

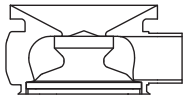
CAD SOLUTION. CAD manual actuators are made from stainless steel with PTFE handles and are fully autoclaveable. Pneumatic actuators are made of stainless steel. CAD Double Position Sensors are made from stainless steel and are fully programmable without mechanical adjustment via PLC or via the CAD Programmer.


Stainless steel
programmable
double position
sensor
PTFE
hand knob
CAD
CLEAN & ASEPTIC DESIGN
Anti-seizing
coated
stainless steel
Stainless steel
manual actuator
Stainless steel
pneumatic actuator
Stainless steel
pneumatic actuator

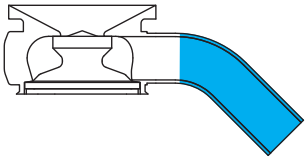
01#

BASIC CONFIGURATIONS

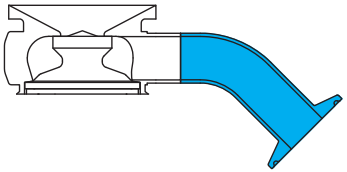
When CIP or SIP is not required before transferring product from the vessel, the basic CAD valve configuration can be selected.



01 A
Short butt weld outlet



01 B
45° elbow butt weld outlet

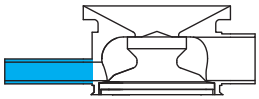


01 C
45° TC outlet

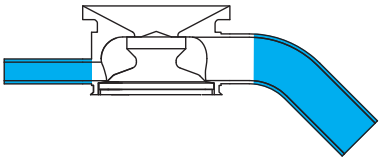
02#

CONFIGURATIONS WITH SIP BUTT WELD PORT

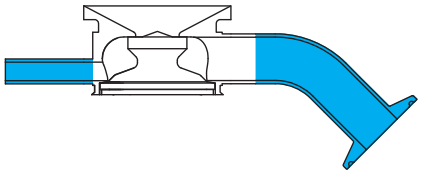
When only downstream SIP is needed before transferring the product from the vessel where the CAD valve is installed, the 02 configuration can be selected. This is a simple and cost friendly solution. The satellite valve can be welded on the additional butt weld port of the CAD BTV.



02 A
Short butt weld outlet



02 B
45° elbow butt weld outlet

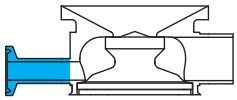


02 C
45° TC outlet

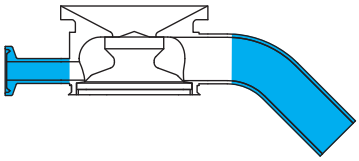
03#

CONFIGURATIONS WITH SIP TC PORT

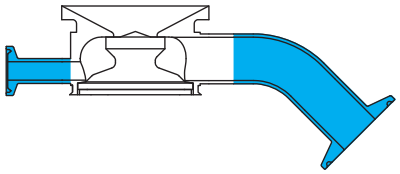
When only downstream SIP is needed before transferring the product from the vessel where the CAD valve is installed, the 03 configuration can be selected. This is a simple and cost friendly solution. The satellite valve can be connected on the additional Tri-Clamp port of the CAD BTV.



03 A
Short butt weld outlet



03 B
45° elbow butt weld outlet

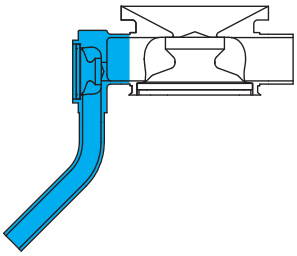


03 C
45° TC outlet

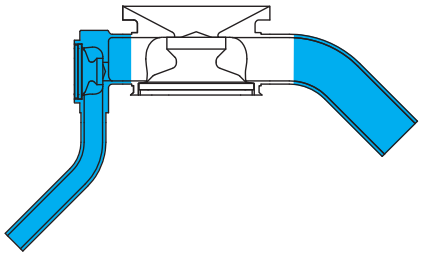
04#

CONFIGURATIONS WITH SATELLITE VALVE FOR STERILE TRANSFER (DOWNSTREAM CIP/SIP)

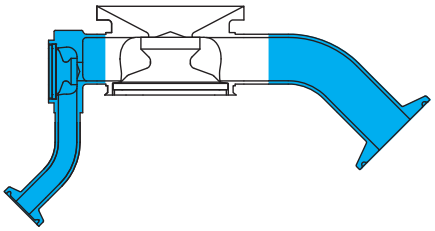
When downstream CIP & SIP is needed, before transferring the product from the vessel where the CAD valve is installed, keeping the shortest distance from the satellite valve to the CAD BTV, the 04 configuration can be selected. This configuration allows the possibility to achieve an optimized and complete solution for sterile processing downstream the preparation vessel.



04 A
Short butt weld outlet



04 B
45° elbow butt weld outlet

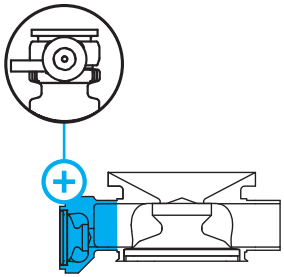


04 C
45° TC outlet

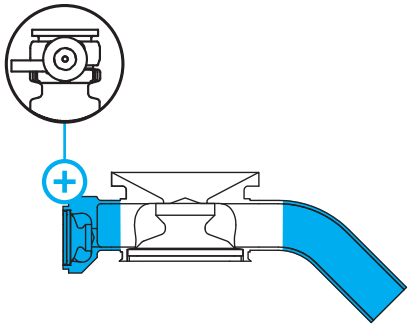
05#

CONFIGURATIONS WITH TANG. LEFT SATELLITE VALVE FOR STERILE TRANSFER (DOWNSTREAM CIP/SIP) AND LOWER SPACE SAVING

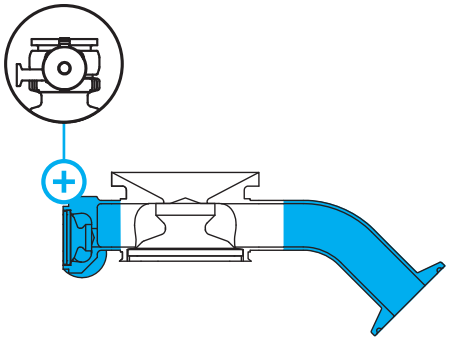
Configuration 05 is the fully optimized solution for downstream processing or transferring of the product from the preparation vessel where the CAD BTV is installed, also taking care of the space under the vessel. The satellite valve in Tangential Left configuration will avoid the use of any elbow in correspondence of the satellite valve inlet. Thanks to this solution, more space will be saved to connect a Bottom Point Assembly to manage condensate.



05 A
Short butt weld outlet



05 B
45° elbow butt weld outlet

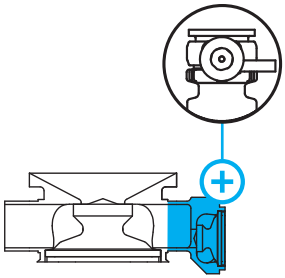


05 C
45° TC outlet

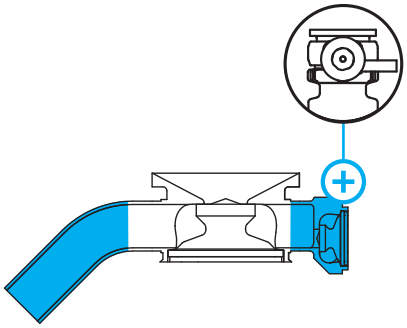
06#

CONFIGURATIONS WITH TANG. RIGHT SATELLITE VALVE FOR STERILE TRANSFER (DOWNSTREAM CIP/SIP) AND LOWER SPACE SAVING

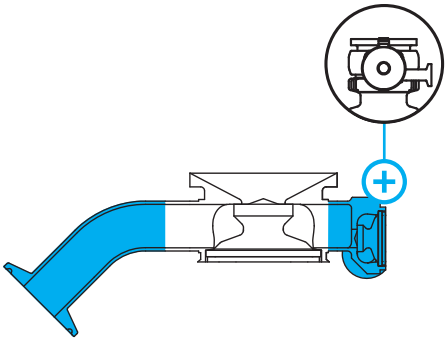
Same engineered solution of configuration 05 # but with opposite connection, Tangential Right inlet on the satellite valve



06 A
Short butt weld outlet



06 B
45° elbow butt weld outlet



06 C
45° TC outlet

CAD
CLEAN & ASEPTIC DESIGN

USER FRIENDLY

BOTTOM TANK VALVES

Body material: 1.4435-BN2 - Low Ferrite - Low Sulphur

Diaphragm material: PTFE USP Class VI - 121°C or EPDM USP Class VI or Silicone USP Class VI

Application Areas: SAFE

Surface Roughness: Internal surface (manually polished) Ra ≤ 0.3µm (16µin)

External surface: Ra ≤ 0.8µm (32µin)

Surface Treatment: Manually polished (available also in EP version - Electropolishing after manual polishing)

Labeling: Each valve body is labeled for full LOT traceability

Packaging: Valve body is sealed in plastic bags and packaged in a closed box

Standard Documentation: Operating and Maintenance bulletin, Certificate of Conformity and Materials Certification 3.1

Quality Control: Quality Assurance System guarantees the control and traceability of the product.

Orders and Information: For additional information, drawings or place an order call your nearest distributor.

K 500
BTV Manual

Bottom Tank Valves
with Manual Actuators
and Diaphragms

K 505
BTV Pneumatic

Bottom Tank Valves
with NC Pneumatic Actuators
and Diaphragms

K 510
BTV Pneumatic with sensors

Bottom Tank Valves
with NC Pneumatic Actuators,
Diaphragms
and Position Sensors

K500

TECHNICAL INFORMATION _ **YBTV A0## #### 1 ## #**

BTV MANUAL

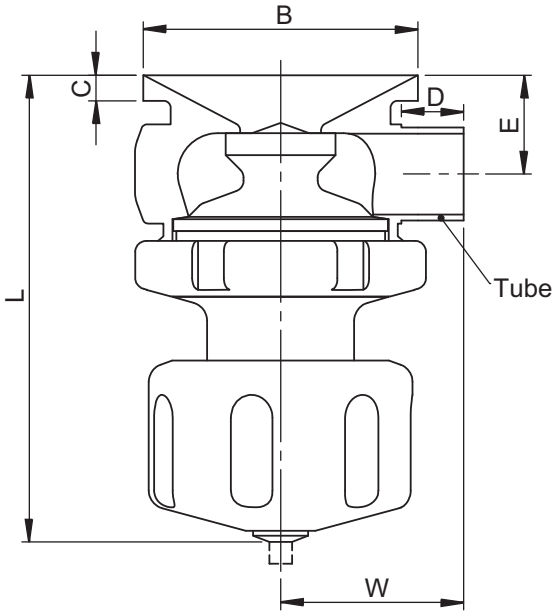
YBTV A0## #### 1 ## # - BOTTOM TANK VALVES WITH MANUAL ACTUATORS AND DIAPHRAGMS are designed to take off fluids from the tank bottom for most stringent applications such as bioreactors, fermenters and preparation tanks. The body shape and their internal design offer a very reliable component for Aseptic Processing Applications. They have a simple and safe design, with full drainability, without asymptotic seals and dead legs, offering fast cleanability and sterilization practices. They are designed to fulfill the most stringent demands of CIP-SIP and production activities in Aseptic Processing. Equipped with PTFE diaphragms acc. to USP Class VI-121°C or EPDM USP Class VI or Silicone USP Class VI, Manual Actuators made from stainless steel and PTFE. Bottom tank valves (BTV) are available in 6 different designs and 3 different outlet configurations to fulfill customer needs: with short butt weld ends, 45°, TC, with or without satellite valve for downstream CIP-SIP for clean and sterile transfer.

CODE	CAD Size	B mm	C mm	D mm	E mm	W mm	Tube mm	L mm	T (*) C°	P bar
YBTV A012 #### 1 ## #	A12	40.00	6.50	13.00	18.50	30.00	12.70x1.65	90.50	-80 / 200	-1 / 6
YBTV A019 #### 1 ## #	A19	55.00	7.00	16.00	21.70	40.00	19.05x1.65	102.00	-80 / 200	-1 / 6
YBTV A025 #### 1 ## #	A25	75.00	7.00	17.00	27.00	50.00	25.40x1.65	128.00	-80 / 200	-1 / 6
YBTV A038 #### 1 ## #	A38	85.00	7.00	18.50	34.50	60.00	38.10x1.65	159.00	-80 / 200	-1 / 6
YBTV A050 #### 1 ## #	A50	110.00	7.00	24.00	40.00	75.00	50.80x1.65	185.00	-80 / 200	-1 / 6

All dimensions are in mm - All data may change without prior notice

(*) For PTFE only

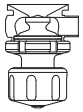

CAD


B
C
D
E
L
Tube
W

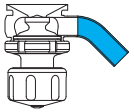
K500 BODY CONFIGURATIONS

ATTENTION: add the code of the configuration (example: “01 C”) after the code of the valve (instead of: “## #”) in order to achieve the complete valve code

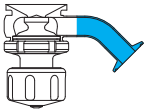
01
Basic configurations



01 A
Short butt weld outlet

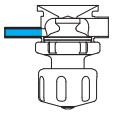


01 B
45° elbow butt weld outlet

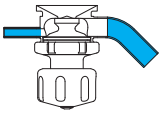


01 C
45° TC outlet

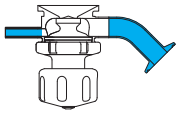
02
Configurations with SIP Butt Weld Port



02 A
Short butt weld outlet

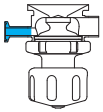


02 B
45° elbow butt weld outlet

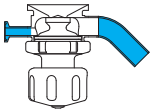


02 C
45° TC outlet

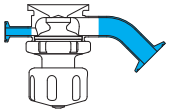
03
Configurations with SIP TC Port



03 A
Short butt weld outlet

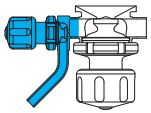


03 B
45° elbow butt weld outlet

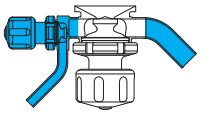


03 C
45° TC outlet

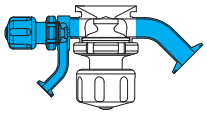
04
Configurations with Satellite Valve for Sterile Transfer (Downstream CIP/SIP)



04 A
Short butt weld outlet

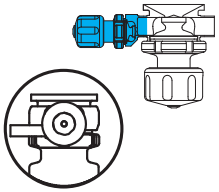


04 B
45° elbow butt weld outlet

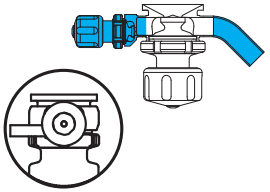


04 C
45° TC outlet

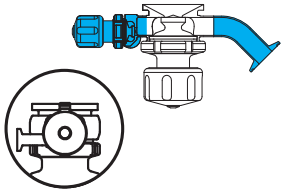
05
Configurations with Tang. Left Satellite Valve for Sterile Transfer (Downstream CIP/SIP) Space saving design for tight areas



05 A
Short butt weld outlet

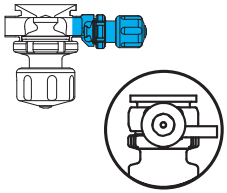


05 B
45° elbow butt weld outlet

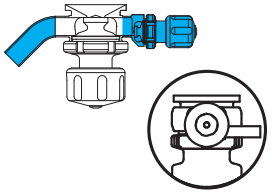


05 C
45° TC outlet

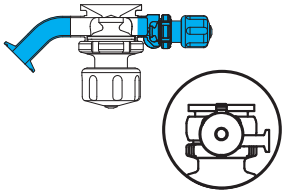
06
Configurations with Tang. Right Satellite Valve for Sterile Transfer (Downstream CIP/SIP) Space saving design for tight areas



06 A
Short butt weld outlet



06 B
45° elbow butt weld outlet



06 C
45° TC outlet

K505

TECHNICAL INFORMATION _ **YBTV A0## #### 2 ## #**

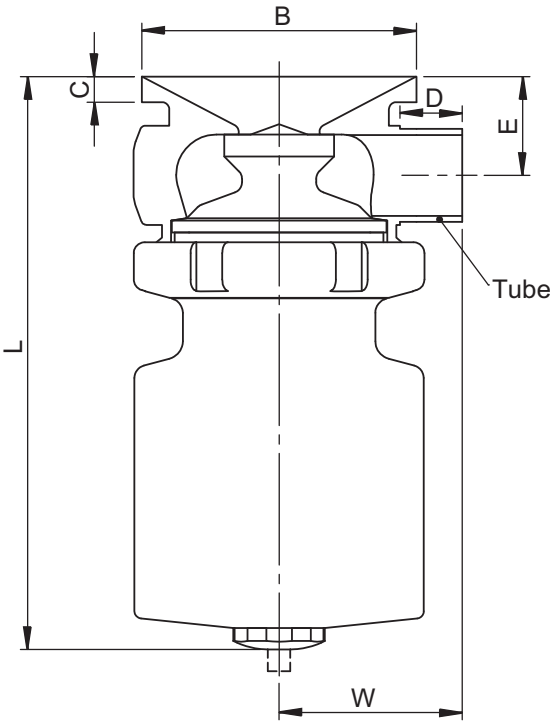
BTV PNEUMATIC

YBTV A0## #### 2 ## # - BOTTOM TANK VALVES WITH NC PNEUMATIC ACTUATORS AND DIAPHRAGMS are designed to take off fluids from the tank bottom for most stringent applications such as bioreactors, fermenters and preparation tanks. The body shape and their internal design offer a very reliable component for Aseptic Processing Applications. They have a simple and safe design, with full drainability, without asymptotic seals and dead legs, offering fast cleanability and sterilization practices. They are designed to fulfill the most stringent demands of CIP-SIP and production activities in Aseptic Processing. Equipped with PTFE diaphragms acc. to USP Class VI-121°C or EPDM USP Class VI or Silicone USP Class VI, NC Pneumatic Actuators made from stainless steel. Bottom tank valves (BTV) are available in 6 different designs and 3 different outlet configurations to fulfill customer needs: with short butt weld ends, 45°, TC, with or without satellite valve for downstream CIP-SIP for clean and sterile transfer.

CODE	CAD Size	B mm	C mm	D mm	E mm	W mm	Tube mm	L mm	T (*) C°	P bar
YBTV A012 #### 2 ## #	A12	40.00	6.50	13.00	18.50	30.00	12.70x1.65	100.00	-80 / 200	-1 / 6
YBTV A019 #### 2 ## #	A19	55.00	7.00	16.00	21.70	40.00	19.05x1.65	115.00	-80 / 200	-1 / 6
YBTV A025 #### 2 ## #	A25	75.00	7.00	17.00	27.00	50.00	25.40x1.65	157.00	-80 / 200	-1 / 6
YBTV A038 #### 2 ## #	A38	85.00	7.00	18.50	34.50	60.00	38.10x1.65	198.00	-80 / 200	-1 / 6
YBTV A050 #### 2 ## #	A50	110.00	7.00	24.00	40.00	75.00	50.80x1.65	243.00	-80 / 200	-1 / 6
YBTV A063 #### 2 ## #	A63	125.00	10.00	24.00	48.00	85.00	63.50x1.65	278.00	-80 / 200	-1 / 6
YBTV A076 #### 2 ## #	A76	150.00	10.00	30.00	58.00	100.00	76.20x1.65	308.00	-80 / 200	-1 / 4
YBTV A000 #### 2 ## #	A00	180.00	15.00	30.00	72.50	115.00	101.60x2.11	425.00	-80 / 200	-1 / 4

All dimensions are in mm - All data may change without prior notice
(*) For PTFE only

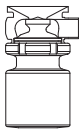
CAD
CLEAN & ASEPTIC DESIGN



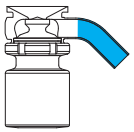
K505 BODY CONFIGURATIONS

ATTENTION: add the code of the configuration (example: “01 C”) after the code of the valve (instead of: “## #”) in order to achieve the complete valve code

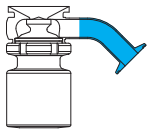
01
Basic configurations



01 A
Short butt weld outlet

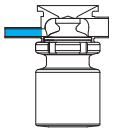


01 B
45° elbow butt weld outlet

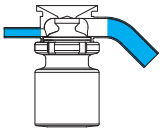


01 C
45° TC outlet

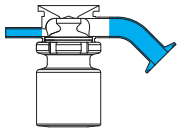
02
Configurations with SIP Butt Weld Port



02 A
Short butt weld outlet

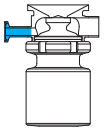


02 B
45° elbow butt weld outlet

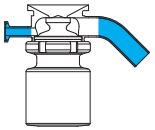


02 C
45° TC outlet

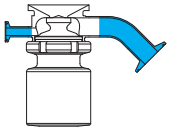
03
Configurations with SIP TC Port



03 A
Short butt weld outlet

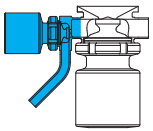


03 B
45° elbow butt weld outlet

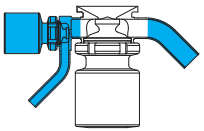


03 C
45° TC outlet

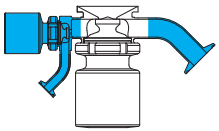
04
Configurations with Satellite Valve for Sterile Transfer (Downstream CIP/SIP)



04 A
Short butt weld outlet

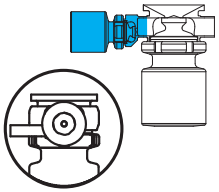


04 B
45° elbow butt weld outlet

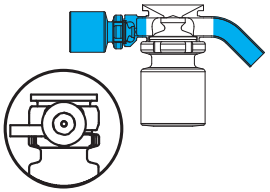


04 C
45° TC outlet

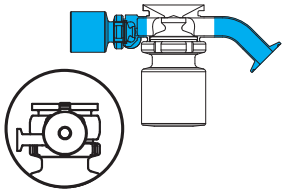
05
Configurations with Tang. Left Satellite Valve for Sterile Transfer (Downstream CIP/SIP) Space saving design for tight areas



05 A
Short butt weld outlet

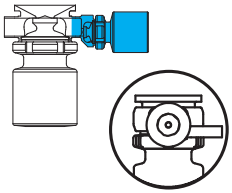


05 B
45° elbow butt weld outlet

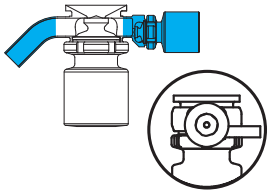


05 C
45° TC outlet

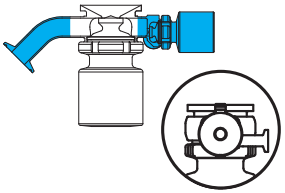
06
Configurations with Tang. Right Satellite Valve for Sterile Transfer (Downstream CIP/SIP) Space saving design for tight areas



06 A
Short butt weld outlet



06 B
45° elbow butt weld outlet



06 C
45° TC outlet

K510

TECHNICAL INFORMATION _ **YBTV A0## #### 3 ## #**

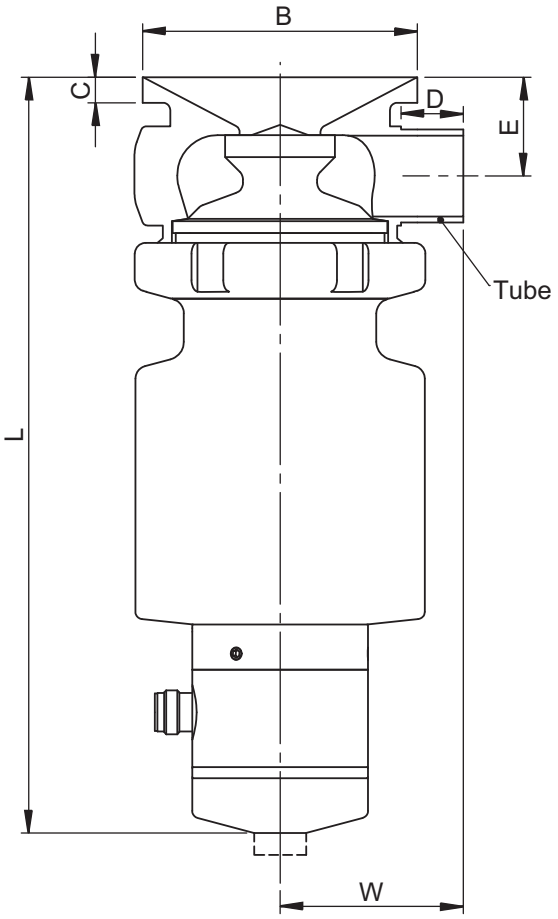
BTV PNEUMATIC WITH SENSORS

YBTV A0## #### 3 ## # - BOTTOM TANK VALVES WITH NC PNEUMATIC ACTUATORS, DIAPHRAGMS AND POSITION SENSORS are designed to take off fluids from the tank bottom for most stringent applications such as bioreactors, fermenters and preparation tanks. The body shape and their internal design offer a very reliable component for Aseptic Processing Applications. They have a simple and safe design, with full drainability, without asymptotic seals and dead legs, offering fast cleanability and sterilization practices. They are designed to fulfill stringent demands of CIP-SIP and production activities in Aseptic Processing. Equipped with PTFE diaphragms acc. to USP Class VI-121°C or EPDM USP Class VI or Silicone USP Class VI, NC Pneumatic Actuators and CAD Programmable Double Position Sensor made from stainless steel. Bottom tank valves (BTV) are available in 6 different designs and 3 different outlet configurations to fulfill customer needs: with short butt weld ends, 45°, TC, with or without satellite valve for downstream CIP-SIP for clean and sterile transfer.

CODE	CAD Size	B mm	C mm	D mm	E mm	W mm	Tube mm	L mm	T (*) C°	P bar
YBTV A012 #### 3 ## #	A12	40.00	6.50	13.00	18.50	30.00	12.70x1.65	150.00	-80 / 200	-1 / 6
YBTV A019 #### 3 ## #	A19	55.00	7.00	16.00	21.70	40.00	19.05x1.65	165.00	-80 / 200	-1 / 6
YBTV A025 #### 3 ## #	A25	75.00	7.00	17.00	27.00	50.00	25.40x1.65	207.00	-80 / 200	-1 / 6
YBTV A038 #### 3 ## #	A38	85.00	7.00	18.50	34.50	60.00	38.10x1.65	248.00	-80 / 200	-1 / 6
YBTV A050 #### 3 ## #	A50	110.00	7.00	24.00	40.00	75.00	50.80x1.65	293.00	-80 / 200	-1 / 6
YBTV A063 #### 3 ## #	A63	125.00	10.00	24.00	48.00	85.00	63.50x1.65	328.00	-80 / 200	-1 / 6
YBTV A076 #### 3 ## #	A76	150.00	10.00	30.00	58.00	100.00	76.20x1.65	358.00	-80 / 200	-1 / 4
YBTV A000 #### 3 ## #	A00	180.00	15.00	30.00	72.50	115.00	101.60x2.11	475.00	-80 / 200	-1 / 4

All dimensions are in mm - All data may change without prior notice
(*) For PTFE only

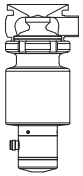

CAD
CLEAN & ASEPTIC DESIGN
CAD


B
C
D
E
Tube
L
W

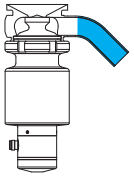
K510 BODY CONFIGURATIONS

ATTENTION: add the code of the configuration (example: “01 C”) after the code of the valve (instead of: “## #”) in order to achieve the complete valve code

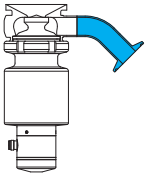
01
Basic configurations



01 A
Short butt weld outlet

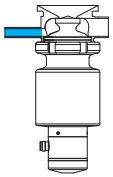


01 B
45° elbow butt weld outlet

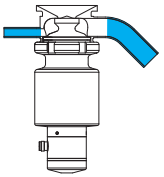


01 C
45° TC outlet

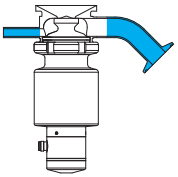
02
Configurations with SIP Butt Weld Port



02 A
Short butt weld outlet

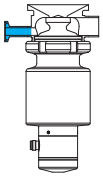


02 B
45° elbow butt weld outlet

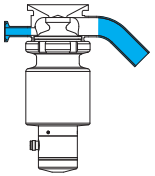


02 C
45° TC outlet

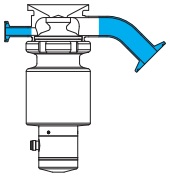
03
Configurations with SIP TC Port



03 A
Short butt weld outlet

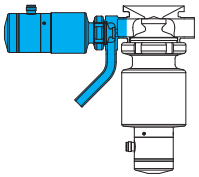


03 B
45° elbow butt weld outlet

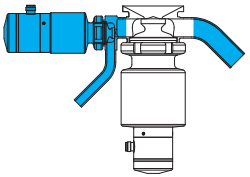


03 C
45° TC outlet

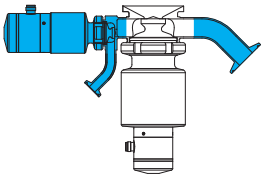
04
Configurations with Satellite Valve for Sterile Transfer (Downstream CIP/SIP)



04 A
Short butt weld outlet

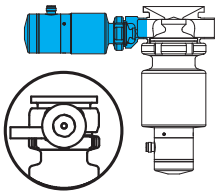


04 B
45° elbow butt weld outlet

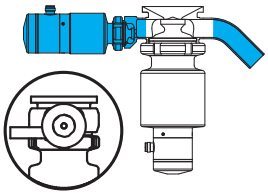


04 C
45° TC outlet

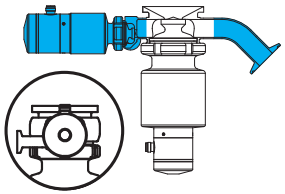
05
Configurations with Tang. Left Satellite Valve for Sterile Transfer (Downstream CIP/SIP) Space saving design for tight areas



05 A
Short butt weld outlet

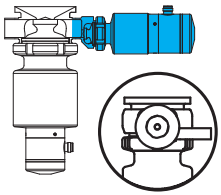


05 B
45° elbow butt weld outlet

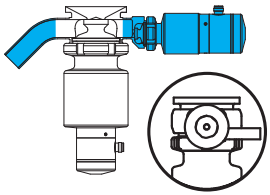


05 C
45° TC outlet

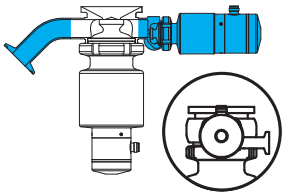
06
Configurations with Tang. Right Satellite Valve for Sterile Transfer (Downstream CIP/SIP) Space saving design for tight areas



06 A
Short butt weld outlet



06 B
45° elbow butt weld outlet



06 C
45° TC outlet

MAP CODE: YBTV A _ _ _ _ _ _ _ _ _ _ _ _

VALVE SIZES

012	1/2”
019	3/4”
025	1”
038	1.1/2”
050	2”
063	2.1/2”
076	3”
000	4”

MATERIAL

PTFE	Polytetrafluoroethylene
SILI	Silicone Platinum Cured
EPDM	Ethylene Propylene Diene Monomer

ACTUATORS TYPE

1	Manual
2	Pneumatic NC
3	Pneumatic NC + Sensor

BODY CONFIGURATIONS

01	Basic config.
02	Config. with SIP BW Port
03	Config. with SIP TC Port
04	Config. with Satellite Valve
05	Config. with Satellite Valve Tang. Left
06	Config. with Satellite Valve Tang. Right

VALVE OUTLET CONNECTION TYPE

A	Short Butt Weld
B	45° elbow Butt Weld
C	45° TC

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