Sampling Valves (BSV Series)
Sterile, Aseptic and Sanitary Valves for Critical Process Systems

For Biotechnological, Pharmaceutical, Food and Beverage Process Systems
The Carten BSV Series sampling valve allows the drug manufacturer to capture samples for characterisation without the risk of contamination, assuring a consistent and reproducible capture each time a sample is required. This is possible as the internal structure contains no dead space, is fully gravity drainable, and can be CIP’d and SIP’d aseptically before the sample is captured.

**Why Choose a Carten Sampling Valve?**

- Bioreactors/Fermentors
- WFI Systems (Storage Tanks, POU sites)
- Process Lines
- Formulation Tanks
- Sterile Holding Tanks
- General Purpose Storage Tanks

**BSV Series Product Features**

- Drainable even from inclined ports
- Retrofits existing ingold sensor ports or tri-clamp connections
- Cleans and sterilises in place
- Install or move in seconds, maintenance friendly
- Sanitary, dead space free design

**Typical Applications**

- Bioreactors/Fermentors
- WFI Systems (Storage Tanks, POU sites)
- Process Lines
- Formulation Tanks
- Sterile Holding Tanks
- General Purpose Storage Tanks

**Technical Specifications**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Carten BSV Series Sample Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Size</td>
<td>Tank Connection 1”</td>
</tr>
<tr>
<td></td>
<td>Sample Connection 1/2”</td>
</tr>
<tr>
<td>Tank Connection</td>
<td>Ingot</td>
</tr>
<tr>
<td></td>
<td>Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>Weld-on</td>
</tr>
<tr>
<td>Construction</td>
<td>Drainable from all ports even incline ports (up to 15°)</td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>6 Bar (90psi)</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>0°C to 135°C (32°F to 275°F)</td>
</tr>
<tr>
<td>Body Material</td>
<td>Barstock ASTM A276/A479 316L (S31603)</td>
</tr>
<tr>
<td>Bonnet Material</td>
<td>ASTM A276/A479 316L (S31603)</td>
</tr>
<tr>
<td>Handwheel Material</td>
<td>PPSU</td>
</tr>
<tr>
<td>Diaphragm Material</td>
<td>EPDM (FKM or Silicon Options)</td>
</tr>
<tr>
<td>Diaphragm Retainer</td>
<td>ASTM A276/A479 316L (S31603)</td>
</tr>
<tr>
<td>Electropolishing</td>
<td>Validated as per ASME BPE (2014)</td>
</tr>
<tr>
<td>Operating Mode</td>
<td>Manual</td>
</tr>
<tr>
<td>Quality and Compliance</td>
<td>EN 10204 3.1 Certified Materials</td>
</tr>
<tr>
<td></td>
<td>Certified as per the Pressure Equipment Directive 2014/68/EC</td>
</tr>
<tr>
<td>Diaphragm Material</td>
<td>Steam</td>
</tr>
<tr>
<td>Liquid Media Min</td>
<td>-10°C (14°F)</td>
</tr>
<tr>
<td>Max</td>
<td>90°C (194°F)</td>
</tr>
</tbody>
</table>

**Diaphragm Material Steam**

- EPDM  
  - Constant 135°C (275°F)
- EPDM
  - Min: -10°C (14°F)
  - Max: 90°C (194°F)
Drainable up to 15-degree Incline Port
The Carten sample valve can be welded directly to the sample point required, however in this case the end user loses the flexibility to capture samples at multiple points, and results in a maintenance problem if issues occur in manufacturing. The Carten SV is retrofittable through Triclamp and Ingold connections as standard, as these fittings are the standard connections for the industry.

Vessels, tanks, fermenters, and bioreactors must all be constructed using GMP principles, and conform with essential standards such as ASME BPE. ASME BPE calls out for a minimum 5°, and maximum 15° angle for these port connections to ensure drainability of the vessel is not adversely affected. The Carten SV ensures drainability even at the maximum 15° angle of the Triclamp or Ingold fitting due to the unique internal profile of the valve structure. This ensures the integrity and repeatability of the sample at all times.

Sanitary design no dead space
It is critical equipment manufacturers clarify the difference between gravity drainable and simply drainable. Drainable can be achieved through additional processes such as an air assisted purge for example. Gravity drainable equates to a self-draining ability of the internal structure with no hold up volume causing contamination. The Carten sampling valve is self-draining, with smooth and gradual internal profiles ensuring delicate proteins cannot become stressed, ensuring a representative sample of the process.

CIP/SIP
To ensure a sample suitable for analysis, the sample must be representative of the process. Therefore, it is necessary to CIP and SIP the sample valve internal product contact surfaces before the sample is taken. The Carten sampling valve includes a CIP/SIP port allowing these utilities without affecting the process within the vessel. The fully drainable internal structure leaves no risk of secondary contamination from the utilities themselves.

Flexible Design – connection type etc
Tanks, vessels, fermenters, and bioreactors all contain multiple connections for instrumentation such as pH probes. These connections are either Triclamp or Ingold as standard, with spare ports available to future proof most units. The Carten sampling valve uses these pre-existing ports to connect to the vessel, allowing the end user the flexibility of multiple instrumentation or equipment installed using the same port.
BSV SERIES CLEAN SAMPLING VALVE

Also, Carten offers a Clean sampling series. When closed, dead space does exist from the vessel side to the seat of the valve. However, internally the valve is fully drainable and constructed from high grade materials, and a metal-to-metal external bonnet seal will never need to be re-torqued. As an option for the customer this valve can also be supplied with a SIP/CIP port for ease of cleaning and maintenance in the system.

The Carten BSV Clean Series is used for sampling from a liquid process. While provided with a SIP/CIP it ensures sterilisation before and after taking a sample. This design is well suited for the pharmaceutical, cosmetic, food and dairy industries.

Technical Specifications

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Carten BSV Series Clean Sampling Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Size</td>
<td>1/2”</td>
</tr>
<tr>
<td>Tank Connection</td>
<td>1” Tri-Clamp as per ASME BPE</td>
</tr>
<tr>
<td>Construction</td>
<td>Bottom Entry Angle Valve</td>
</tr>
<tr>
<td>Pressure Rating</td>
<td>25 Bar [375psi]</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>Standard = 0 to 85°C, Special Seat = 0 to 150°C</td>
</tr>
<tr>
<td>Body Material</td>
<td>ASTM A276/A479 316L (S31603)</td>
</tr>
<tr>
<td>Bonnet Material</td>
<td>ASTM A276/A479 316L (S31603)</td>
</tr>
<tr>
<td>Handwheel Material</td>
<td>PC/POM</td>
</tr>
<tr>
<td>Diaphragm Material</td>
<td>Elgiloy, 316L (S31603) with PTFE (standard)/VESPEL (special)</td>
</tr>
<tr>
<td>Diaphragm Retainer</td>
<td>ASTM A276/A479 316L (S31603)</td>
</tr>
<tr>
<td>Electropolishing</td>
<td>Validated as per ASME BPE [2014]</td>
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<td>Operating Mode</td>
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Flow Distribution Valves

Point of Use valves (Flow Distribution Valves) are one of the most essential diaphragm valves used in the biotechnology, pharmaceutical, food and beverage industries. These valves allow process fluids to be transferred, sampled, drained or diverted with minimal impact on critical systems such as water for injection (WFI) and purified water. They can be provided with a SIP/CIP port that allows steam or materials to be purged rather than being trapped within the system.

Carten Point of Use and Flow Distribution valves provide the most efficient and best-in-class for drainability, cleanability, ease of maintenance and lightweight design for critical sterile processes.

Product Features

- Radial Diaphragm or Weir Diaphragm Designs available
- Valve remains flush with main process lines
- Integrated Elbow Option available for piping loops
- SIP/CIP port options available
- Simple Maintenance Friendly Design
- Sanitary Design, No Dead Space/Gravity Drainable Option Available
- Interchangability in Design
- Cost Effective (TCO) with Competitive Lead Times

Typical Applications

- Bioreactors/Fermentors
- WFI Systems (Storage Tanks, POU sites)
- Process Lines
- Formulation Tanks
- Sterile Holding Tanks
- General Purpose Storage Tanks
**BNW Series Diaphragm Valves**
- ASME BPE Compliant Design and Dimensions
- SIP500 Rated Life Durability (ASME BPE rating)
- No Re-torquing Required
- Compact, Light Weight Stainless Steel Top Works
- Reduced Polymer Cold Flow Sealing Design
- Reduced TCO for Process Systems
- Range of Instrumentation Available
- 3-Way Zero Dead T (ZDT) leg configurations
- SIP & CIP Capability

**BPV Series Pinch Valves**
- Quick Release and Control Versions
- Reusable Highly Durable Valve
- Interchangeable Fittings
- For Use with Multiple Compounds
- For Use with Multiple Brands
- Rapid Changeout of Tubing, Line Size
- Lightweight Handwheel/Actuator
- No Particle Generation
- Instrumentation Ready

**BTV Series Tank Outlet Valves**
- No hold up volume or pooling
- Self Draining at any orientation
- Higher Cv/ Superior Flow
- SIP/CIP Port
- Cost Efficient
- Maintenance Friendly
- No Delivery Delays - Weld Component Sent in Advance

**BSP Series SipTube Valves**
- Cleanable- and Sterilisable In-Place (CIP/SIP) while in operation
- Install in existing ports
- Simplistic design for reliability and fast, easy maintenance
- Body lengths up to 16 inches for sampling deep within the process system
- Suitable for process inoculating, media feeding and sampling
- 316L Stainless Steel construction
- Natural body insulation protects processes during sterilisation

**BPU Series Point of Use Valves**
- Lowest hold up volume in the industry
- Fully Cleanable/drainable
- Lightweight Design- Compare to ZDT
- Same High Flow as Carten TOV Valve
- 360-degree- Multiple Orientation
- Quick-release clamp topworks
- SIP/CIP port available

**SBV Series Sanitary Ball Valves**
- In-Line Maintenance
- Blow-out Proof Stem
- Cavity and Non-Cavity Filled Options
- 2-Way and 3-Way Configurations
- Bidirectional Sealing
- Anti-static features (on request)

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THE CARTEN-FUJIKIN RANGE

- Bellows Valves
- Ball Valves
- Check Valves
- Diaphragm Valves
- Tank Valves
- Ceramic Valves
- Sanitary Pinch Valves
- Integrated Gas Sticks and Systems