Orifice Butterfly Valve

Flow control valve to reduce cavitation and noise at high differential pressure

BT-1Q type
**Orifice butterfly valve controls flow at high differential pressure**

### Characteristics

1. **Anti-cavitation structure**
   
   Achieves flow control at high differential pressure by multiple distributed nozzles which divide the flow at all opening degrees.

2. **Low noise**
   
   Possible to modulate the flows at high flow rate without making noise.

3. **Light and compact**
   
   More compact than sluice and globe valves by adopting the butterfly valve structure.

4. **Water sealing by rubber seat**
   
   Has excellent water sealing, same as the JWWA B 138 butterfly valve.

### Merit

1. **Standard Butterfly valve**
   
   As the valve opens, a crescent shape opening gets bigger.

2. **Multi-hole variable orifice valve**
   
   The breakdown of flow in to multiple small jets reduces noise and makes throttling more effective with less cavitation, even as the valve opens up.

3. **Orifice butterfly valve**
   
   Cavitation is suppressed by multiple distributed nozzles which divide flow and the valve opens. This can achieve higher performance than multi-hole variable orifice valves.

The disc of orifice butterfly valve can rotate 90 degrees.

The breakdown of flow in to small holes contributes to its high performance, same as the multi-hole variable orifice valve.
Kurimoto’s Orifice Butterfly Valve reduces noise

**Structure**

Hybrid valve combined with the structure of orifice valve and butterfly valve

- **Full guide type**: Suitable for flow control at high flow rate
- **Half guide type**: Reduces energy loss at full opening

![Diagram showing the structure of Kurimoto’s Orifice Butterfly Valve](image)

**Cavitation reducing structure**

While a standard butterfly valve causes cavitation because of the turbulence flow at the outlet side, the orifice butterfly valve can achieve less cavitation.

**Standard butterfly valve**

- [Flow direction](image)
- [Flow image](image)
- [Internal inspection photo](image)

**Orifice butterfly valve**

- [Flow direction](image)
- [Flow image](image)
- [Internal inspection photo](image)
Allowable inlet pressure $H_A$

$H_A$ is the new measurement standard to select the most suitable valve, not the allowable cavitation coefficient. The curve shows the inlet pressure applicable to the velocity against a certain outlet pressure. $H_A$ helps to easily judge if the valve is feasible for the condition.

The above figures are limited to the internal inspection which may vary depend on actual operating conditions.
**Allowable cavitation figure**

The orifice butterfly valve (both sides types) has good performance, same as the multi-hole valve.

![Graph showing allowable cavitation figure](image)

- BT-DD Disc polyflow valve (high performance type)
- BT-1Q Orifice butterfly valve (half guide)
- FT-10 Multi-hole variable butterfly valve
- BT-1Q Orifice butterfly valve (full guide)

Opening degree \( \alpha [\%] \)

The above figures are limited to the internal inspection which may vary depend on actual operating conditions.

**Noise reducing structure**

BT-1Q reduces noise more effectively than standard butterfly valves.

At high flow speed, it has the same performance as multi-hole variable orifice valves.

![Graph showing noise reducing structure](image)

- Cavitation figure \( \sigma \approx 0.5 \)
- Standard butterfly valve
- BT-1Q Orifice butterfly valve
- FT-10 Multi-hole variable orifice valve

Flow speed inside pipelines \( v [m/s] \)

The above figures are limited to the internal inspection which may vary depend on actual operating conditions.
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These measurements are for the electrically-operated type. Please contact us if you need measurements for other types. We can manufacture larger BT-1Q at your request.
**Standard Specification**

<table>
<thead>
<tr>
<th>Type of valve</th>
<th>BT-1Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>Multi-hole spherical disc (both sides type, one side type)</td>
</tr>
<tr>
<td>Diameter</td>
<td>200～1000  Please contact us for larger diameter</td>
</tr>
<tr>
<td>Pressure</td>
<td>4.5K, 7.5K, 10K</td>
</tr>
<tr>
<td>Operation</td>
<td>Manual, Manual cap type, Electrical</td>
</tr>
<tr>
<td>Flange</td>
<td>JWWA B 138</td>
</tr>
<tr>
<td>Fluid</td>
<td>Tap water, Industrial water, Agricultural water</td>
</tr>
</tbody>
</table>

**Checklist for selecting flow control valve**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Quantity</th>
<th>Fluid</th>
<th>Operation</th>
<th>Flange</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Manual/Electric/other</td>
<td></td>
<td>Flow rate/Pressure/Water level</td>
</tr>
</tbody>
</table>

**Hydraulic condition**

<table>
<thead>
<tr>
<th>Inlet pressure</th>
<th>Case1</th>
<th>Case2</th>
<th>Case3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow rate</td>
<td>m³/s</td>
<td>m³/s</td>
<td>m³/s</td>
</tr>
</tbody>
</table>

**Kurimoto, LTD.**

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