Variable Orifice Double Regulating Valve

Flow Data and Installation Instructions

This datasheet is designed as a guide and should not be regarded as wholly accurate in every detail. We reserve the right to amend the specification of any product without notice.
The Albion ART 250 is a variable orifice double regulating valve used to regulate and measure the flow passing through it.

**Flow Coefficient**

The flow rate can be calculated using the $K_v$ value and a measured signal.

$$K_v = \frac{Q \times 36}{\sqrt{\Delta P}}$$

$$K_{vs} = \frac{Q \times 36}{\sqrt{\Delta P_s}}$$

where $K_v$ & $K_{vs}$ = flow coefficient (m$^3$/hr at 1 bar differential)

$Q$ = flow rate (l/s)

$\Delta P$ = headloss attributable to valve (kPa)

$\Delta P_s$ = differential pressure across tappings (signal) (kPa)

**$K_{vs}$ Values**

The $K_{vs}$ values are given on each flow chart at various positions from 25% to fully open.

**Pressure Loss and $K_v$ Value**

The pressure loss across a variable orifice double regulating valve is the same as the differential pressure (signal) measured across the body seat.

The $K_v$ value is therefore the same as the $K_{vs}$ value used to calculate flow rate.

**Installation**

Variable orifice double regulating valves must always be installed with a minimum of 5 pipe diameters of straight pipe, without intrusion, upstream of the valve and a minimum of 2 pipe diameters downstream.
Technical Data

Sizing

Once the required flow rate has been calculated, the size of the variable orifice double regulating valve can be determined based on the following:

With the valve fully open, a minimum signal at the design flow rate of 1 kPa. The maximum signal is normally less than 5 kPa but can be up to 10 kPa.

For sizing the flow velocity should not exceed 3 m/s at the design flow rate.

Pressure Equipment Directive

Under the Pressure Equipment Directive (PED) these variable orifice double regulating valves have been specified for Group 2 Liquids i.e. non-hazardous.

Sizes DN50 to DN80 are classified as SEP (Sound Engineering Practice)
**Signal / Flowrate**

Chart used to determine flowrate from signal measured across orifice

\[ Q = \frac{K_{vs} \sqrt{\Delta p}}{36} \]

**Where**

- \( Q \) = Flowrate \( l/s \)
- \( \Delta p \) = Signal \( kPa \)
- \( K_{vs} \) = Signal Co-efficient

**Position**

<table>
<thead>
<tr>
<th>Position</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>( K_{vs} )</td>
<td>10.2</td>
<td>15.2</td>
<td>21.9</td>
<td>29.7</td>
<td>38.9</td>
<td>44.7</td>
<td>48.2</td>
</tr>
</tbody>
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Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

\[ Q = \frac{K_{vs} \sqrt{\Delta p}}{36} \]

Where

- \( Q \) = Flowrate, l/s
- \( \Delta p \) = Signal, kPa
- \( K_{vs} \) = Signal Co-efficient

Position  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
---|---|---|---|---|---|---|---|
\( K_{vs} \) | 20.6 | 30.9 | 44.0 | 58.3 | 70.3 | 77.8 | 82.6 |
DN80 ART 250 Variable Orifice Double Regulating Valve

Signal / Flowrate

Chart used to determine flowrate from signal measured across orifice

\[ Q = \frac{K_{vs} \sqrt{\Delta p}}{36} \]

Where

- \( Q \) = Flowrate \( l/s \)
- \( \Delta p \) = Signal \( kPa \)
- \( K_{vs} \) = Signal Co-efficient

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<tbody>
<tr>
<td>( K_{vs} )</td>
<td>20.9</td>
<td>35.4</td>
<td>52.1</td>
<td>73.7</td>
<td>92.1</td>
<td>105.6</td>
<td>117.4</td>
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Issue 1

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Signal / Flowrate
Chart used to determine flowrate from signal measured across orifice

\[ Q = \frac{K_{vs} \sqrt{\Delta p}}{36} \]

Where
\[ Q = \text{Flowrate} \quad \text{l/s} \]
\[ \Delta p = \text{Signal} \quad \text{kPa} \]
\[ K_{vs} = \text{Signal Co-efficient} \]
DN150 ART 250 Variable Orifice Double Regulating Valve

$Q = K_{vs} \sqrt{\Delta p}$

Where

$Q$ = Flowrate  l/s

$\Delta p$ = Signal  kPa

$K_{vs}$ = Signal Co-efficient

Signal / Flowrate
Chart used to determine flowrate from signal measured across orifice

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<tbody>
<tr>
<td>$K_{vs}$</td>
<td>125.1</td>
<td>183.3</td>
<td>254.9</td>
<td>320.5</td>
<td>369.2</td>
<td>418.0</td>
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**Signal / Flowrate**

Chart used to determine flowrate from signal measured across orifice

\[ Q = \frac{K_{vs} \sqrt{\Delta p}}{36} \]

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- \( Q \) = Flowrate \( l/s \)
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<tr>
<td>( K_{vs} )</td>
<td>268.1</td>
<td>335.3</td>
<td>399.2</td>
<td>463</td>
<td>540</td>
<td>625</td>
<td>683</td>
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**DN250 ART 250 Variable Orifice Double Regulating Valve**

**Signal / Flowrate**
Chart used to determine flowrate from signal measured across orifice

\[ Q = \frac{K_{vs} \sqrt{\Delta p}}{36} \]

Where:
- \( Q \) = Flowrate \( \text{l/s} \)
- \( \Delta p \) = Signal \( \text{kPa} \)
- \( K_{vs} \) = Signal Co-efficient

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</tr>
</thead>
<tbody>
<tr>
<td>( K_{vs} )</td>
<td>183</td>
<td>250</td>
<td>324</td>
<td>415</td>
<td>518</td>
<td>630</td>
<td>756</td>
<td>894</td>
<td>1013</td>
<td>1135</td>
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DN300 ART 250 Variable Orifice Double Regulating Valve

Signal / Flowrate Chart used to determine flowrate from signal measured across orifice

\[ Q = \frac{K_{vs} \sqrt{\Delta p}}{36} \]

Where
- \( Q \) = Flowrate \( \text{l/s} \)
- \( \Delta p \) = Signal \( \text{kPa} \)
- \( K_{vs} \) = Signal Co-efficient

Position

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<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>( K_{vs} )</td>
<td>462</td>
<td>633</td>
<td>830</td>
<td>1025</td>
<td>1215</td>
<td>1393</td>
<td>1575</td>
<td>1730</td>
<td>1850</td>
<td>2022</td>
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