**Anti-condensation valve**

**280 series**

**Function**

The anti-condensation valve, used in heating systems with a solid fuel generator, automatically regulates at the set value the temperature of the water returning to the generator. Keeping the generator at a high temperature prevents condensation of the water vapour contained in the flue gas. It can be used both on boilers and residential generators such as fireplace heating systems, thermostoves and thermostokers.

The anti-condensation valve gives the generator a longer life and ensures greater efficiency.

**Product range**

280 series  Anti-condensation valve sizes DN 20 (3/4”, 1”), DN 25 (1”), DN 32 (1 1/4”)

**Technical specifications**

**Materials**

| Body          | DN 20: brass EN 12165 CW617N  
|              | DN 25, DN 32: brass EN 1982 CB753S  
| Plug          | brass EN 12164 CW614N  
| Obturator     | PSU  
| Spring        | stainless steel  
| Seal          | EPDM  
| Union seals   | non-asbestos fibre  
| Wax thermostatic sensor |  

**Performance**

| Medium                                   | water, glycol solutions  
| Max. percentage of glycol               | 50%  
| Max. working pressure                   | 10 bar  
| Working temperature range               | 5–100°C  
| Setting temperatures (Tset)             | 45°C, 55°C, 60°C, 70°C  
| Setting accuracy                        | ±2°C  
| By-pass complete closing temperature    | Tmix=Tset+10°C=Tr  
| Connections                             | 3/4” - 1” - 1 1/4” M (ISO 7/1) with union  

**Dimensions**

<table>
<thead>
<tr>
<th>Code</th>
<th>DN</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28005</td>
<td>20</td>
<td>3/4”</td>
<td>67,5</td>
<td>135</td>
<td>105,5</td>
<td>29</td>
<td>76,5</td>
<td>0,750</td>
</tr>
<tr>
<td>28025</td>
<td>20</td>
<td>1”</td>
<td>67,5</td>
<td>135</td>
<td>105,5</td>
<td>29</td>
<td>76,5</td>
<td>0,830</td>
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<tr>
<td>28006</td>
<td>25</td>
<td>1”</td>
<td>88,5</td>
<td>177</td>
<td>153,5</td>
<td>42</td>
<td>111,5</td>
<td>1,650</td>
</tr>
<tr>
<td>28007</td>
<td>32</td>
<td>1 1/4”</td>
<td>97</td>
<td>194</td>
<td>157</td>
<td>40</td>
<td>117</td>
<td>2,050</td>
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</table>

*Code completion*

<table>
<thead>
<tr>
<th>Setting</th>
<th>45°C [55°C]</th>
<th>60°C</th>
<th>70°C</th>
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<tbody>
<tr>
<td></td>
<td>4</td>
<td>5</td>
<td>6</td>
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</tbody>
</table>
Wooden biomass and condensation build-up

Wooden solid fuel contains a variable moisture percentage depending on the type (logs, pellets, woodchips etc.) and seasoning. Water vapor is released during the solid fuel drying phase inside the combustion chamber. The presence of cold zones in the generator or flue gas chimney can lower the temperature of the flue gas down to the dew point, causing condensation to occur. Water vapour condenses on the generator surfaces, together with soot and part of the unburnt hydrocarbons contained in the flue gas, producing deposits and tar. These substances stick to the walls of the generator, covering most of the inner surfaces. In addition to being dangerous due to its flammability, tar is damaging to the integrity of the generator and limits the efficiency of the flue gas-system water exchanger.

By keeping the generator walls at the highest possible temperature, the anti-condensation valve limits the formation of these substances, thereby increasing the combustion efficiency, controlling the emissions into the environment and prolonging the generator life.

Operating principle

The thermostatic sensor (1), completely immersed in the medium, controls the movement of an obturator (2) that regulates the flows in by-pass (7) and toward the system. At the start-up of the heat generator, the anti-condensation valve recirculates the flow water so as to bring the generator up to temperature as quickly as possible (fig. 1). When the flow temperature $T_f$ exceeds the setting of the anti-condensation valve $T_{\text{set}}$, the valve’s cold port (8) starts opening to produce the water mixing $T_{\text{mix}}$: in this phase the system loading begins (fig. 2).

When the return temperature to the generator $T_{\text{mix}}$ is greater than the setting of the anti-condensation valve by approximately 10°C, the by-pass (7) port closes and water returns to the generator at the same temperature as the system return (fig. 3 and fig. 4).
**Construction details**

**Brass body**
The brass body prevents the formation of ferrous residues in the system, thereby helping to prolong the life of the heat generator.

**Thermostatic sensor replacement for setting modification**
The thermostatic sensor can be easily removed for maintenance or setting change.

**Temperature gauge holders**
The body of the anti-condensation valve in sizes DN 25 and DN 32 features temperature gauge holders on the front and rear sides. The holders allow the housing of code F29571 temperature gauges for controlling the working temperatures of the valve: by-pass water from the flow line, water returning from the system and mixed water returning to the generator.

**Hydraulic characteristics**

![Hydraulic特性图](image)

<table>
<thead>
<tr>
<th>Size</th>
<th>DN 20</th>
<th>DN 25</th>
<th>DN 32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections</td>
<td>3/4&quot;</td>
<td>1&quot;</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>Kv (m³/h)</td>
<td>3.2</td>
<td>3.2</td>
<td>9</td>
</tr>
</tbody>
</table>

**Installation**
The valve can be fitted on both sides of the generator in any position, vertical or horizontal. **Installation is recommended on the return to the generator in mixing mode.** It is also allowed on the flow from the generator in diverter mode.

**Sizing method / Setting selection**
The valve selection should be made according to the Kv value (corresponding to a specific DN body size) and not only according to the threaded connections. According to the power output and thermal load on the heat generator, the flow rate provided by the generator can be calculated. With this value, it's possible to use the hydraulic characteristics diagram to obtain the head loss of the valve. The sum of the head losses on the valve and head losses of the rest of the system should be compatible with the available head of the generator pump. The setting (°C) must be selected so as to guarantee a return temperature to the generator that is high enough to prevent condensation, also using the information or instructions supplied by manufacturers of solid fuel generators.

**Application diagram**

Solid fuel generator, direct supply to the system
280 series

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