**APPLICATIONS**

The SOGAV™ (Solenoid Operated Gas Admission Valve) is an electrically actuated, high response gas admission valve for in-manifold (port) fuel admission. The SOGAV is designed for use on four-cycle, turbocharged, natural gas or dual-fuel engines. One SOGAV is required for each cylinder.

The SOGAV is the electro-mechanical portion of an overall Woodward fuel admission system consisting of:

- In-Pulse™ electronic fuel injection control
- Main speed/air-fuel ratio/engine sequencing control (must regulate air manifold and gas manifold pressures as well as fuel admission)
- Other necessary valves, actuators, regulators, sensors, cables, and safety devices

Driven by electronic control, SOGAVs are typically used for in-cylinder injection systems. They can be supplied in manual, solenoid, or electrically actuated forms. They can be supplied in a variety of sizes and to fit many different engine types. They are used in combination with Woodward electronic fuel injection systems for four-stroke engines. Woodward offers a complete family of SOGAV valves, including SOGAV43 and SOGAV105, which are typically used for engines in the 15–28 cm bore range and 25–40 cm bore range, respectively. A thorough sizing analysis must be performed for any new application, since fuel properties and engine use can affect valve choice.

Governing is done by valve opening duration and/or gas pressure modulation. The SOGAV43 is generally suitable for use with engines in the 15–28 cm bore range, and the SOGAV105 is generally suitable for engines in the 25–40 cm bore range. A thorough sizing analysis must be performed for any new application, since fuel properties and engine use can affect valve choice.

The SOGAV’s E-core solenoid has a short travel and high output force which result in fast and consistent opening and closing response. The valve is a face-type poppet with multiple concentric grooves. The moving metering plate is spring-loaded and pressure-loaded in the close direction.

- Port fuel admission for improved cylinder-to-cylinder control
- All-electric actuation
- Fast response
- Simple installation
- Electronic fuel injection technology for four-stroke engines
- For new engines and retrofits
- Choice of sizes
- Works with Woodward In-Pulse™ electronics
- CSA Class I, Division 2, Groups A, B, C, D
- CE Compliant
SPECIFICATIONS

CONSTRUCTION

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>All parts exposed to the gas are resistant to corrosion and stress corrosion cracking</td>
</tr>
<tr>
<td>Mounting</td>
<td>May be mounted in any configuration</td>
</tr>
<tr>
<td>Gas Inlet Hole Diameter</td>
<td>30 mm (SOGAV43)</td>
</tr>
<tr>
<td></td>
<td>44 mm (SOGAV105)</td>
</tr>
</tbody>
</table>

ENVIRONMENT

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>–20 to +105 °C (–4 to +221 °F)</td>
</tr>
<tr>
<td>Vibration Qualification Test:</td>
<td></td>
</tr>
<tr>
<td>Test Method</td>
<td>US MIL-STD-810C Method 514.2</td>
</tr>
<tr>
<td>Curve</td>
<td>F (20 g – Figure 514.2-2)</td>
</tr>
<tr>
<td>Resonance Search</td>
<td>5–2000 Hz</td>
</tr>
<tr>
<td>Dwell Endurance</td>
<td>30 minutes at each major resonance in each axis</td>
</tr>
<tr>
<td>Sweep Endurance</td>
<td>3 hours minus the dwell time in each axis</td>
</tr>
<tr>
<td>Humidity, Salt Spray, Pressure Wash</td>
<td>The unit withstands exposure to pressure washing, salt spray, etc., without adverse corrosion or infiltration</td>
</tr>
</tbody>
</table>

PERFORMANCE

Response (assumes the use of a Woodward In-Pulse™ control):

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to full open after signal on</td>
<td>0.0020 sec. max (SOGAV43)</td>
</tr>
<tr>
<td></td>
<td>0.0028 sec. max (SOGAV105)</td>
</tr>
<tr>
<td>Time to full closed after signal off</td>
<td>0.0020 sec max (SOGAV43)</td>
</tr>
<tr>
<td></td>
<td>0.0028 sec max (SOGAV105)</td>
</tr>
<tr>
<td>Maximum Leakage When Closed</td>
<td>Less than 0.25% of the rated steady state flow rate</td>
</tr>
<tr>
<td>Filtration Required for Long Life</td>
<td>5 µm absolute max particle size</td>
</tr>
<tr>
<td>Heat Dissipation</td>
<td>8 W (maximum)</td>
</tr>
<tr>
<td>Expected Maximum Gas Supply Pressure (P1)</td>
<td>500 kPa (5 bar abs; 72 psi abs) (SOGAV43)</td>
</tr>
<tr>
<td></td>
<td>450 kPa (4.5 bar abs; 65 psi abs) (SOGAV105)</td>
</tr>
<tr>
<td>Expected Maximum Air Manifold Pressure (P2)</td>
<td>300 kPa (3.0 bar abs; 43 psi abs)</td>
</tr>
<tr>
<td>Maximum Gas Manifold to Air Manifold Maximum Pressure Difference</td>
<td>200 kPa (2.0 bar; 29 psi) (SOGAV43)</td>
</tr>
<tr>
<td></td>
<td>150 kPa (1.5 bar; 22 psi) (SOGAV105)</td>
</tr>
<tr>
<td>Maximum Backfire Pressure Spike (without backflowing through valve)</td>
<td>50 kPa (0.5 bar; 7 psi) above the current gas manifold pressure</td>
</tr>
<tr>
<td>Expected Maximum Gas Supply Temperature</td>
<td>60 °C (140 °F)</td>
</tr>
</tbody>
</table>

CLASSIFICATION

Solenoid Certification (cable/gland nut version only)
CSA Class I, Division 2, Groups A, B, C, D
European Hazardous Locations EEx m II T4, LCIE 98.E6132X
Declaration of Incorporation (DOI) per the Machinery Directive 98/37/EC
Exempt from the Pressure Equipment Directive 97/23/EC per Article 1-3.10

REFERENCE MANUAL

04144 SOGAV43/105 Installation, Operation, and Maintenance
SOGAV43 Outline Drawing

SOGAV105 Outline Drawing
(Do not use for construction)