SOGAV™ 43 and SOGAV 105
Solenoid Operated Gas Admission Valve

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 valve is designed for use on four-cycle, turbocharged, natural gas or dual-fuel engines. One SOGAV valve is required for each cylinder.

The SOGAV valve 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

Governing is done by valve opening duration and/or gas pressure modulation.

The SOGAV 43 valve is generally suitable for use with engines in the 15–28 cm bore range, and the SOGAV 105 valve 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 valve’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 (unbalanced versions only) in the close direction.

Note that the SOGAV 105 has pressure-balanced top-load, unbalanced top-load, and unbalanced bottom-load versions.

- 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
- Certified for North American Hazardous Locations
- Compliant with applicable CE Directives – EMC, Low Voltage, ATEX, Machinery, Pressure Equipment
Specifications

CONSTRUCTION

Materials
All parts exposed to the gas are resistant to corrosion and stress corrosion cracking.

Mounting
May be mounted in any configuration with the solenoid axis greater than horizontal, placing the solenoid higher than the metering plates. However, a vertical orientation (valve inlet facing upward) is preferred and will substantially increase valve life versus a horizontal orientation.

Gas Inlet Hole Diameter
30 mm (SOGAV 43)
44 mm (SOGAV 105)

ENVIRONMENT

Operating Temperature
−20 to +105 °C (−4 to +221 °F)

Vibration
Contact Woodward for vibration qualification data and analysis.

Humidity, Salt Spray, Pressure Wash
The unit withstands exposure to pressure washing, salt spray, etc., without adverse corrosion or infiltration.

PERFORMANCE

Response (assumes the use of a Woodward In-Pulse™ control) is dependent on current waveform and (for unbalanced valves) the pressure differential. Typical 90 V In-Pulse II current waveform results below:

Time to full open after signal on
0.0020 s max (SOGAV 43)
0.0028 s max (SOGAV 105/unbalanced bottom-load)
0.0028 s (SOGAV 105/top-load)

Time to full closed after signal off
0.0020 s max (SOGAV 43)
0.0028 s max (SOGAV 105/unbalanced bottom-load)
0.0028 s (SOGAV 105/top-load)

Maximum Leakage When Closed
Less than 0.25% of the rated steady state flow rate

Filtration Required for Long Life
5 µm absolute max particle size

Expected Maximum Gas Supply Pressure (P1)
500 kPa (5 bar abs; 72 psi abs) (SOGAV 43)
450 kPa (4.5 bar abs; 65 psi abs) (SOGAV 105/unbalanced)
650 kPa (6.5 bar abs; 94 psi abs) (SOGAV 105/balanced)

Expected Maximum Air Manifold Pressure (P2)
300 kPa (3.0 bar abs; 43 psi abs)
400 kPa (4 bar abs, 58 psi abs) (all SOGAV 105s)

Maximum Gas Manifold to Air Manifold Pressure Difference
200 kPa (2.0 bar; 29 psi) (SOGAV 43)
150 kPa (1.5 bar; 22 psi) (SOGAV 105/unbalanced)
250 kPa (2.5 bar; 36 psi) (SOGAV 105/balanced)

Maximum Backfire Pressure Spike
(without backflowing through valve)
50 kPa (0.5 bar; 7 psi) above the current gas manifold pressure

Expected Maximum Gas Supply Temperature
80 °C (176 °F)

REGULATORY COMPLIANCE

(Hazardous Locations listings are limited to solenoid only.)

European Compliance for CE Marking:
Low Voltage Directive 2006/95/EC
ATEX Directive 94/9/EC Zone 2, Category 3, Group II G, EEx m II T4 X

Other European Compliance:
(Compliance with the following European Directives or standards does not qualify this product for application of the CE Marking.)
Machinery Directive 2006/42/EC Compliant as partly completed machinery
Pressure Equipment Directive 97/23/EC Exempt per Article 1-3.10

North American Compliance:
(Certified as a component for use in other equipment only.)
CSA CSA Certified for Class I, Division 2, Groups A, B, C, D T4 at 105 °C Ambient for use in Canada and the United States
SOGAV 43 Outline Drawing
(Do not use for construction)

SOGAV 105 Outline Drawing
(Do not use for construction)
In-manifold Electric Gas Admission

Timing: In-manifold Gas Admission

Reference Manuals

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>04144</td>
<td>SOGAV 43 Installation and Operation</td>
</tr>
<tr>
<td>26498</td>
<td>SOGAV 105 (Top-Load) Installation and Operation</td>
</tr>
<tr>
<td>26499</td>
<td>SOGAV 105 (Unbalanced Bottom-Load) Installation and Operation</td>
</tr>
</tbody>
</table>

For more information contact:

WOODWARD
PO Box 1519, Fort Collins CO, USA 80522-1519
1000 East Drake Road, Fort Collins CO 80525
Tel.: +1 (970) 482-5811  •  Fax: +1 (970) 498-3058
www.woodward.com

Distributors & Service
Woodward has an international network of distributors and service facilities. For your nearest representative, call the Fort Collins plant or see the Worldwide Directory on our website.

This document is distributed for informational purposes only. It is not to be construed as creating or becoming part of any Woodward contractual or warranty obligation unless expressly stated in a written sales contract.

Copyright © Woodward 1999–2013, All Rights Reserved