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.

SOGAV 43

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

SOGAV 105
(unbalanced bottom-load)

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.

SOGAV 105
(balanced top-load)

- 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 Qualification Test:	
Test Method	US MIL-STD-810C Method 514.2
Curve	F (20 g – Figure 514.2-2)
Resonance Search	5–2000 Hz
Dwell Endurance	30 minutes at each major resonance in each axis
Sweep Endurance	3 hours minus the dwell time in each axis
Balanced Version Vibration Qualification Test:	
Test Method	Woodward RV3
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 wave form and (for unbalanced valves) the pressure differential. Typical 90 V In-Pulse II and current wave form 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 Maximum 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:

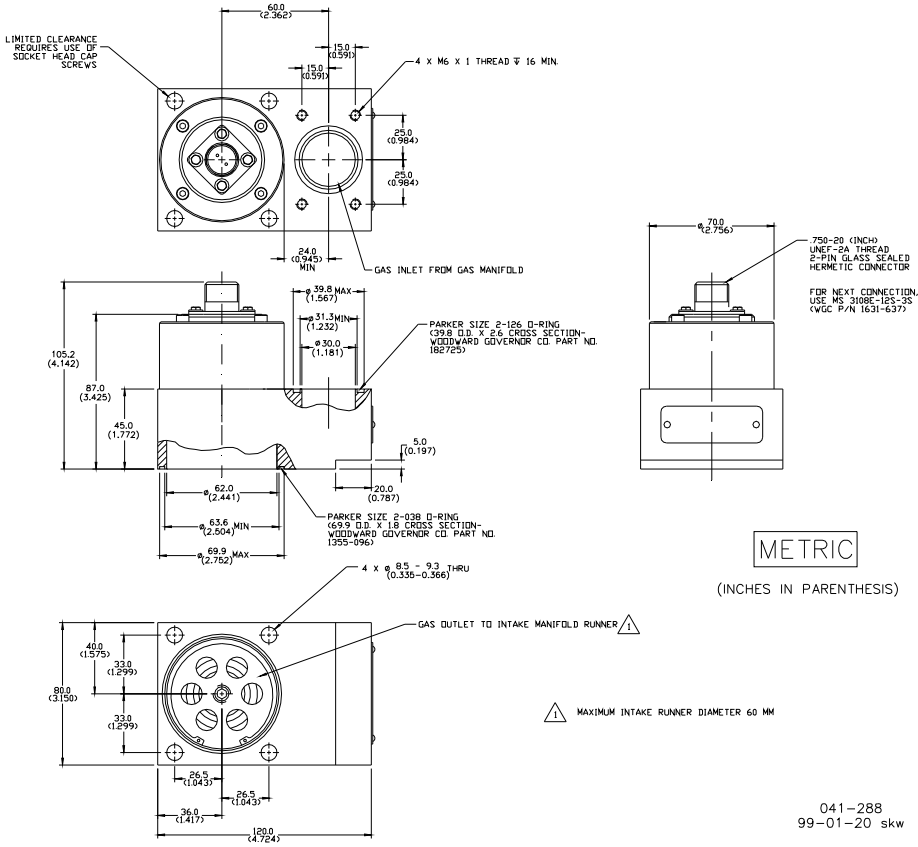
(Compliance with the following European Directives or standards does not qualify this product for application of the CE Marking.)

EMC Directive	2004/108/EC Not applicable to this product. Electromagnetically passive devices are excluded from the scope of the 2004/108/EC Directive.
Machinery Directive	2006/42/EC Compliant as partly completed machinery
Pressure Equipment Directive	97/23/EC Exempt per Article 1-3.10

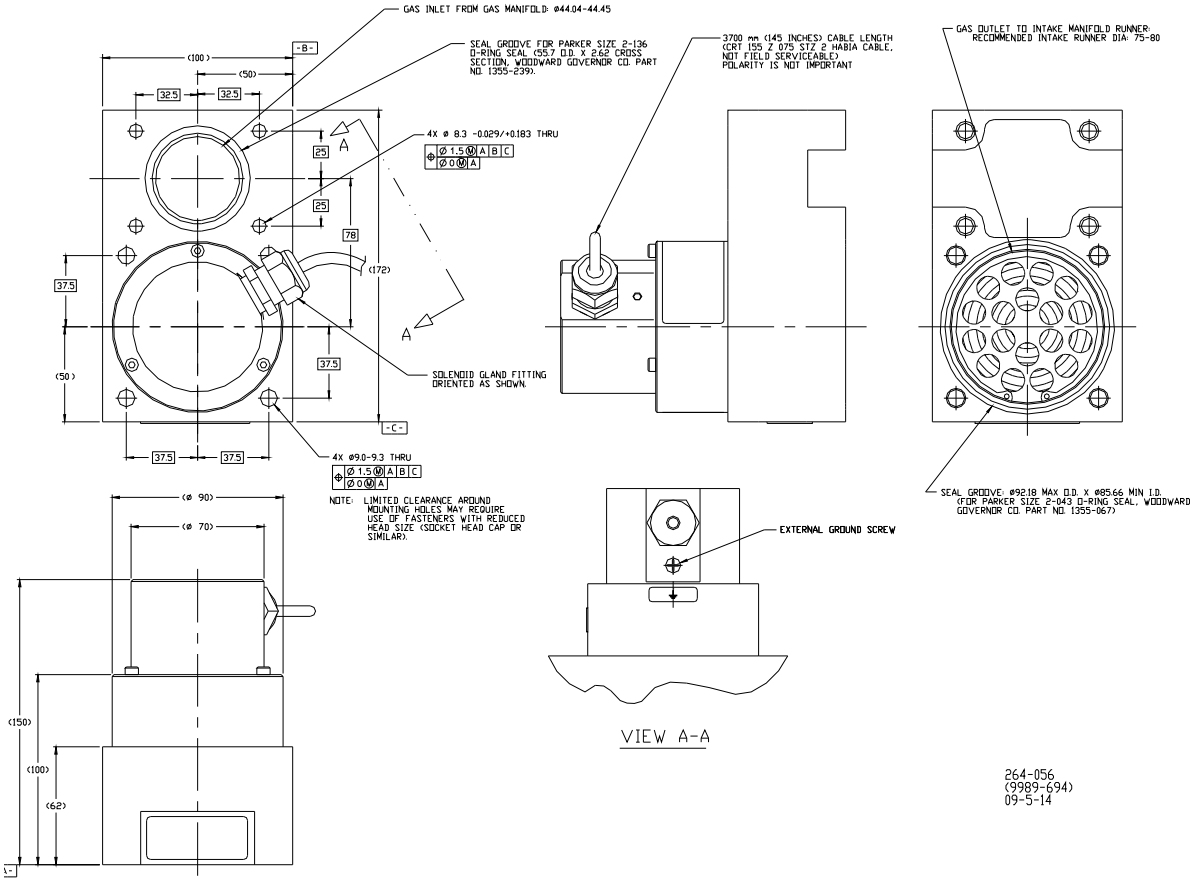
North American Compliance:

(Certified as a component for use in other equipment only.)

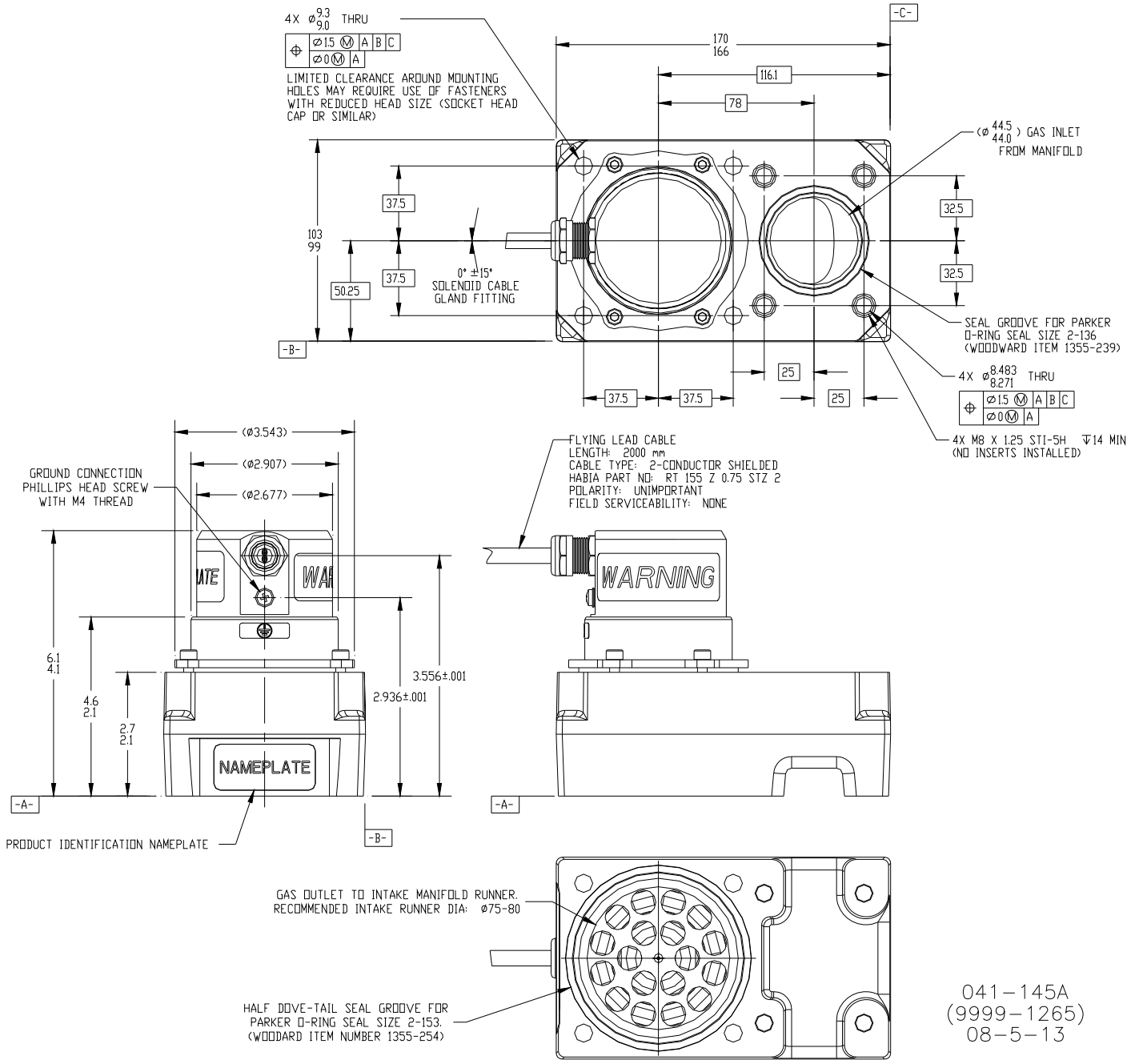
CSA	CSA Certified for Class I, Division 2, Groups A, B, C, D T4 at 105 °C Ambient for use in Canada and the United States



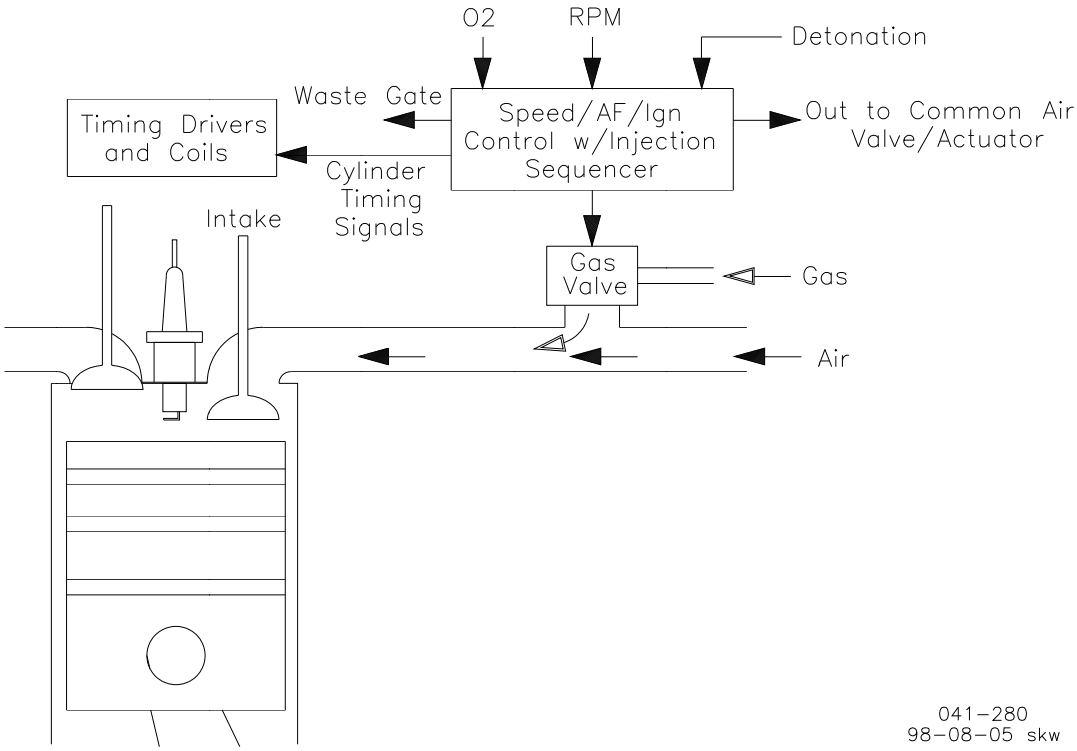
SOGAV 43 Outline Drawing



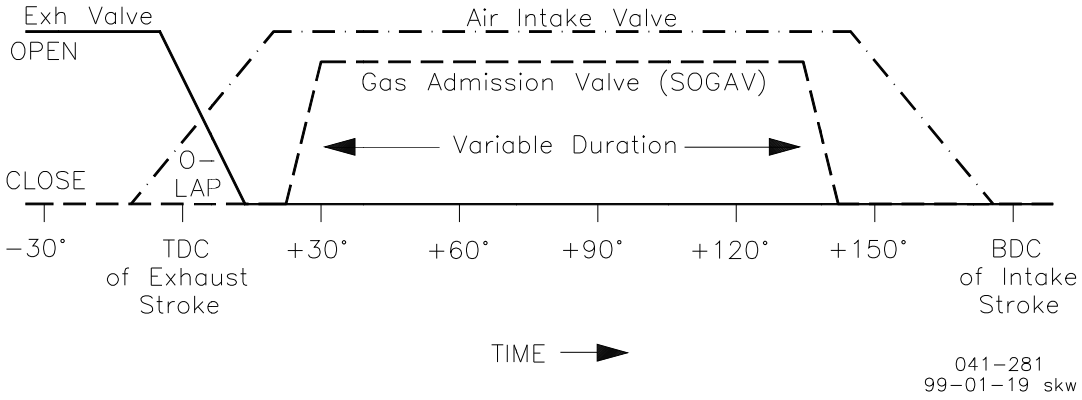
SOGAV 105 Outline Drawing
(Do not use for construction)



Balanced SOGAV 105 Outline Drawing
(Do not use for construction)



In-manifold Electric Gas Admission



Timing: In-manifold Gas Admission

Reference Manuals

04144	*SOGAV 43 Installation and Operation*
26498	*SOGAV 105 (Top-Load) Installation and Operation*
26499	SOGAV 105 (Unbalanced Bottom-Load) *Installation and Operation*

WOODWARD

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