

Automated Gas Assisted Injection Molding System

Description

The APP Automated Gas Assisted Injection Molding System (AGAIMS) provides precise pressure generation and control from atmospheric pressure to 300 psi (pneumatic system). The AGAIMS assists the injection molding process by inputting the desired amount of pressure into the mold at the optimal time, thereby ensuring that the part being molded forms properly.

Software

The AGAIMS is completely microprocessor controlled and fully automated. The system allows the user to define a desired pressure profile that can be simulated. Easy-to-use AGAIMS software is compatible with Windows '98 and higher. Throughout the pressure control process, this software provides useful reports and data, including real-time graphical display of the desired versus actual pressure profile. Upon termination of the pressurization process, data such as the actual and desired pressure profiles and the percent error can be downloaded for further analysis. APP also has the capability to customize the software to produce reports and data required for a specific application.

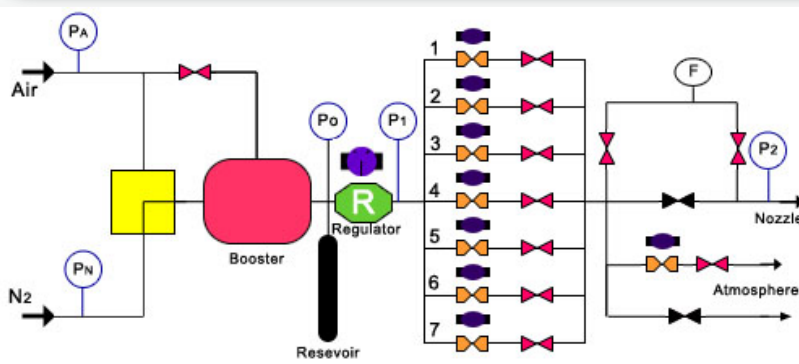
Applications

The Automated Gas Assisted Injection Molding System can be used to enhance the injection molding process in the plastics industry. By automating and accurately controlling the gas injection process, the AGAIMS helps the plastics industry to minimize materials costs without sacrificing strength. The AGAIMS helps to ensure that the part being molded takes the desired form with little operator effort.

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Hardware: Pneumatic System (Applications up to 3,000 PSI)



Key

- PA: Auxiliary Gauge for Inlet Air
- PN: Auxiliary Gauge for Inlet Nitrogen
- PO: Auxiliary Gauge for Reservoir
- P1: Auxiliary Gauge for Regulator
- P2: Main Pressure Gauge
- Booster: Air-driven Compressor
- Reservoir: High Pressure Reservoir of 2.0 Liters
- Regulator: Motorized High Pressure Regulator
- F: Flow Meter
- 1-7: Motorized Metering valves for Pressure Control; Eighth Valve for Venting
- 13 Solenoid Valves: 7 for Pressure Control, 1 for Inlet Selection 3 for Bypass to Flow Meter, 2 for Venting

The AGAIMS (pneumatic system) comprises a booster, regulator, reservoir, pressure transducer, flow meter, motorized valves, and a pressure controller. The DC motor driven piston pressure generator produces up to 3000 psi output. A highly accurate pressure transducer monitors system pressure and provides feedback. The AGAIMS - Pneumatic System contains motorized metering valves for pressure control and venting, and solenoid valves for pressure control, inlet selection, and venting. The high degree of pressure control offered by the AGAIMS Pneumatic System is accomplished through a unique arrangement of needle valves, which regulate the flow of injection gas. Initially, the maximum flow of gas that can pass through the lines, mild, and nozzle orifice without causing a choked condition is determined; the needle valves then adjust automatically to a series of settings. Essentially, the needle valves are sized to provide maximum control at all times. The number of needle valves employed is dependant on the percentage of resolution of control desired - higher resolution requires more needle valves.

The solenoid valves can be activated in different combinations to control the gas flow from 0.40 to 99.6% of maximum flow rate. To follow any given pressure target curve, the program will automatically activate a different combination of the solenoid valves.

The AGAIMS is available only as a pneumatic system (hydraulic system not available).

Specifications

Working Fluid	N/A
Air Requirement	80 psi
Pressure Range	0 - 3,000 psi
Pressure Transducer	Range: 0 - 3,000 psi Accuracy: Up to 0.01 % FS
System Resolution	1/20,000 (65536 optional)
System Control Accuracy	+/- 0.02 % FS
Pressure Settings	Up to 20 different pressure steps
Pressurization Rate	0.1 psi/sec - 500 psi/sec
Power Requirements	110 VAC, 60Hz (220 VAC, 50 Hz optional)
Dimensions	36.5" h x 25.5 w x 19" d
Weight	100 lbs

Pneumatic

Features

- Highly accurate pressure transducer monitors system pressure and provides feedback
- User-determined pressure profile
- Multi-level, fail-safe system provides over-pressurization protection
- Windows-based software handles all control, measurement, data collection, and report generation; complete manual control also possible
- Compatible with Windows '98 and higher
- Real-time graphical test display depicts desired pressure profile and actual results through pressure injection process
- Multiple pressure outlet ports available
- Automatic refill of the generator for high volume situations
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- Multiple pressure generator systems for continuous and multi-axis pressureization(optional)
- Customized report formats available
- Minimal maintenance required

