

AMESim

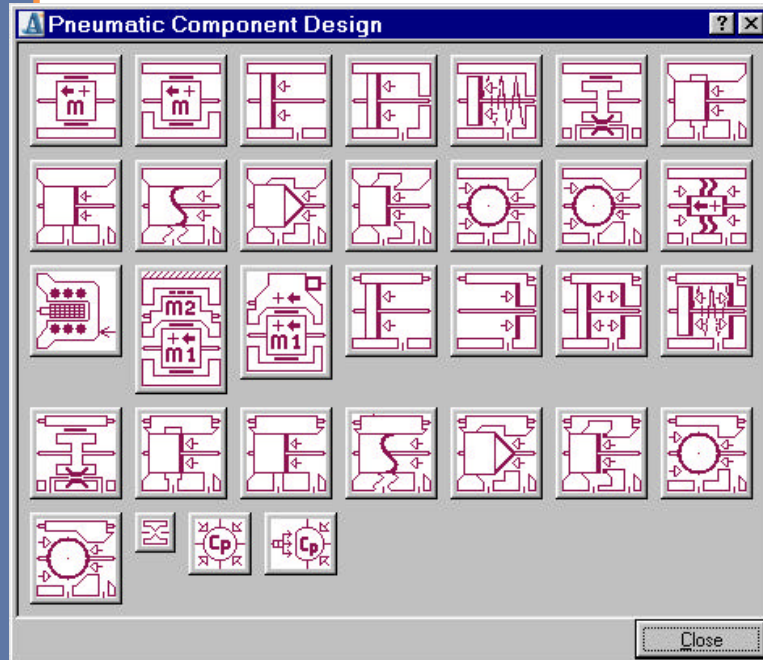
LIBRARIES – PNEUMATIC COMPONENT DESIGN

KEY POINTS

- Steady-state and transient simulation.
- Graphical interface enables you to create new designs quickly.
- State-of-the-art theory. Easy parameters filling from manufacturers' experiments or data from technical drawings .
- Recognizable technological icons facilitating direct model correlation with technical drawings.
- Full multi-domain compatibility for total system analysis with study of energetic couplings.
- Complex modeling without writing a single line of code thanks to a Basic Element approach.
- Build and save your own models for easy reuse.
- Sensitivity analysis and size optimization.
- Time domain and frequency analysis for vibration modes characterization (eigenvalues, modal shapes, transfer functions).
- Matlab®/Simulink® interface for control design.
- Direct integration of your own C and Fortran code.
- Fully compatible with other AMESim libraries.

Overview

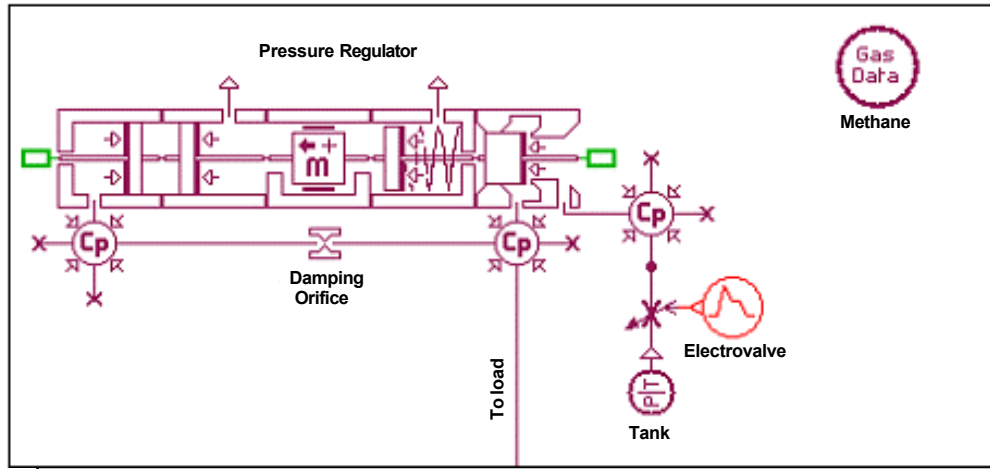
The AMESim® Pneumatic Component Design library is an incredibly powerful and unique tool including the basic building blocks of any pneumatic system. This library can be viewed as an engineering language able to model pneumatic components such as LPG injectors, actuator, compressor, oxygen regulator, dampers or any kind of pneumatic valve. Since the models are component-based, interpretation of the model layout is straightforward and intuitive.



Benefits

For engineering systems in the automotive, off-highway, aerospace or industrial arenas, the main stumbling block is the diversity of pneumatic components.

Developed by our expert engineers, the AMESim Pneumatic Component Design library (PCD) handles this diversity by using a subdivision that enables you to build the greatest number of engineering system models from the smallest number of icons and models. We could describe those as technological units since each element is a tangible object for an engineer. With most PCD models, you could almost go to the engineering store, collect the corresponding physical objects and use them to make a component. Experience shows that, by using this library, companies save months in the development cycle of pneumatic components and significantly reduce the number of prototypes.



Example of a methane pressure regulator modeled with the AMESim PCD library.

Features

The AMESim Pneumatic Component Design library enables you to rapidly design, analyze and optimize any kind of pneumatic component:

- All standard types of technologies included (spool, conical poppet, ball poppet, piston, diaphragm and others).
- Detail models are possible, that include:
 - Dynamics of the moving bodies.
 - Limitations and saturations.
 - Mass flow rate induced by upstream pressure, temperature and pressure ratio.
 - Subsonic and sonic flow in orifices.
 - Variation in the cross section.
 - Variation in the flow coefficient (C_q) and mass flow parameter (C_m).
 - Volume variation.
 - Mass flow rate induced by the movement.
 - Friction and leakages.
 - Pneumatic forces.
 - Flow forces.
- Calculation of all the required variables (mass and enthalpy flow rates, pressures, temperature, cross section, valve lift, volume...), accessible during or after computation.
- Perfect or semi-perfect gas assumption with rigorous handling of gas properties and mass conservation.

PCD model families

- Single mass with frictions and end-stops.
- Double masses with frictions and end-stops.
- Solenoid.
- Pneumatic orifice.
- Pneumatic volume
- A large set of pneumatic component function with fixed or moving body:
 - Piston.
 - Piston with spring.
 - Viscous frictions and leakages.
 - Spool with annular orifice.
 - Spool with orifice hole.
 - Spool with slot orifices.
 - Spool with specific orifice.
 - Poppet with sharp edge seat.
 - Poppet with conical seat.
 - Poppet with no seat.
 - Poppet with plain seat.
 - Ball poppet with sharp edge seat.
 - Ball poppet with conical seat.
 - Diaphragm.

Requirements

The AMESim Pneumatic Component Design library runs on Unix[®], Linux[®] platforms and Pentium[®]-based PCs.

The AMESim Pneumatic library is required.

IMAGINE
www.amesim.com

Contact IMAGINE directly:

USA: +1 734 207 5557
 UK: +44 18 69 351 994
 France: +33 (0)4 77 23 60 30
 Germany: +49 89 548 495 0
 China: +86 13818750986
 Japan: +81 (0) 3 3351 9691

E-mail: info@amesim.com

Visit www.amesim.com to obtain contact information for authorized IMAGINE representatives in other countries.