

FINE

**Integrated Environment
for HVAC Projects**

4M

The Innovative tool for Heating-Ventilation-Air Conditioning Design

- FINE-HVAC is the only package in the market that "thinks", "suggests" and performs drawings and calculations fully automatically, creating the complete project issue, along with all the drawings. It relieves the designer of the time-consuming drawing tasks providing the best HVAC solutions. FINE-HVAC combines both designing and calculations in a seamless integrated environment, consisted of two main components, CAD and Calculations:
- The CAD component operates either on autodesk's AutoCAD platform or independently (including IntelliCAD), with common menus and file format (dwg) in both cases. It thinks, proposes and implements best design solutions (i.e. location of heating units, routing procedures for piping systems, transformation of an one-line airduct system to 2D and 3D etc), producing automatically the entire calculations issue for every HVAC project, as well as all the drawings on their final form.
- The Calculations component adopts the most modern Techniques and latest International Standards. It consists of 8 modules: Heating Loads, Single Pipe System, Twin Pipes System, Infloor System, Cooling Loads, Fan Coils, Air Ducts and Psychrometry. Each module acquires data directly from the drawings, thus resulting in significant time saving and maximum reliability of the project results. It can also be used independently, by typing data within the module spreadsheets.

✓ Fully Automatic Drawing

Fully Automatic Drawing FINE/AutoFINE expert recommends and draws projects through automated commands, the most important of which are listed below



Automatic Receptor Installation: FINE/AutoFINE expert automatically installs on the ground plan radiators, fan coils, air-duct grills as well as illuminants and switches etc. Moreover, this procedure follows expert intelligence rules, which are open to the



user's preferences (e.g. radiator preference order, window height control, limit for additional radiator etc). The installation may also concern receptor systems on grids (e.g. sprinklers, illuminants, grills etc on grid) while detailed ground plan layouts are automatically created.

Automatic Pipe Drawing commands (autorouting): The commands "Double Pipe" (e.g. induction - return) or "Cables" "Parallel to Wall" or "Parallel to Points" etc accelerate significantly the installation drawing while all connections are automatically created through the "magic" autorouting commands (e.g. 2-3 movements are enough to connect a network of illuminants to the main panel or a sprinkler group to the vertical column or gas devices to the chimneys)



Heating



Thermal Losses

Calculation of thermal losses, according to DIN 4701/77 and 4701/83, performed automatically from the drawings or by analytical typing with the ability of easy typical cases management. Printing of total and analytical thermal losses lists for each level and space. Energy analysis using the Degree-day method.



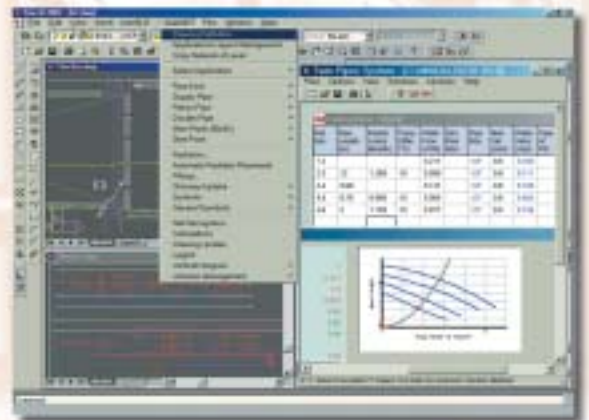
Twin Pipe System

Calculation of Twin-Pipe Heating Installation of any network arrangement (classic or reverse return) directly from the ground plan or by simple typing. Solutions that follow the classical method or even the full hydraulic simulation method, with reverse network solution and definition of the operating point (intersection point of characteristic network curve and circulator curve). Analytical calculation of Radiators, Boiler, Burner, Circulator, Safety System, Chimney, Tank etc with the option to select from rich data libraries. Bill of materials, Cost estimation, Bids. Technical descriptions with the option to select among existing prototypes. Analytical printing of calculation issue and vertical chart.



Single Pipe System

Full-scale calculations of Single-Pipe Heating System with the three following methods: Method of equal pressure drops (Self-balancing), method of equal temperature drops or method of full hydraulic simulation, which is reverse solution for the selected circulator. Insertion of networks on ground plans through the



Infloor Heating System

Full-scale calculations of Infloor Heating System pipes, calculation of Boiler, Burner, Circulator, Safety System, Chimney, Tank etc with the option to select from rich data libraries. Bill of materials, Cost estimation, Bids, Technical Descriptions etc.



Air-conditioning Loads

Air-conditioning Loads Analytical calculation of cooling loads, performed automatically from drawings or with analytical typing. Option to select among the Carrier method, Ashrae CLTD or Ashrae TFM (transfer function) methods. Rich in structural elements and data libraries. Full-scale climatologic data for the major cities. Shading calculations following three different methods. Analytical calculations for each case of additional loads (due to lighting, persons, appliances, ventilation etc). Capability of grouping spaces in (up to 50) zones and systems. Total and analytical results presented in tables and charts with user-defined level of detail.



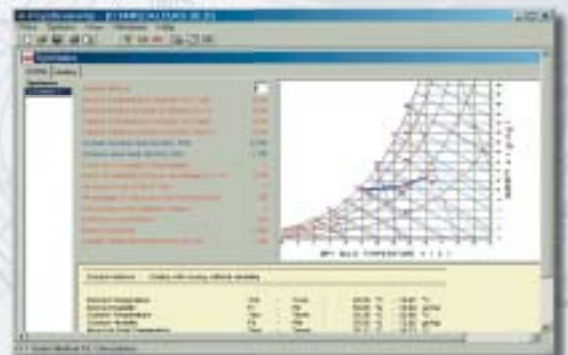
Air-ducts

Calculation of Fans and other installation elements. Rich equipment libraries, Bill of Materials, Cost estimation, Bids. Technical descriptions with the option to select among existing prototypes. Analytical printing of calculation issue and vertical chart.



Psychrometry

Selection of Air-conditioning Units and distribution of air in the air-conditioned spaces using the psychrometry analytical equations (for Cooling and Heating) and utilizing any method (for example, cooling with drying, re-heating, pre-cooled air, bypass of return air, 100% fresh air etc). Analytical results presented in tables and diagrams (psychrometric variation on the psychrometric chart). Analytical specifications for appropriate Air-conditioning Units selection.



Fan Coils

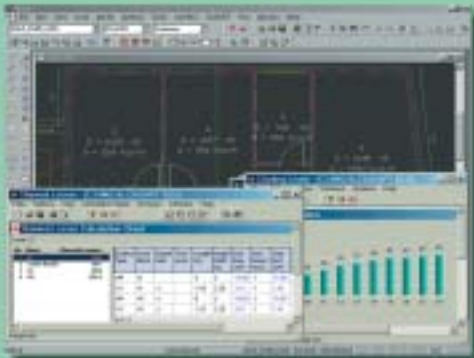
Calculation of Fan Coils Network pipes of any arrangement (classic or reverse return). Network definition automatically from drawings or by typing. Solutions that follow the classical or even the full hydraulic simulation method, with reverse network solution and definition of the operating point (intersection point of characteristic network curve and circulator curve). Analytical calculation of FCU units, Central Unit, Pump, Safety System etc, all selected from rich in hardware data, updateable libraries. Bill of materials, Cost estimation, Bids. Technical descriptions with the option to select among existing prototypes. Analytical printing of calculation issue and vertical chart.

FINE

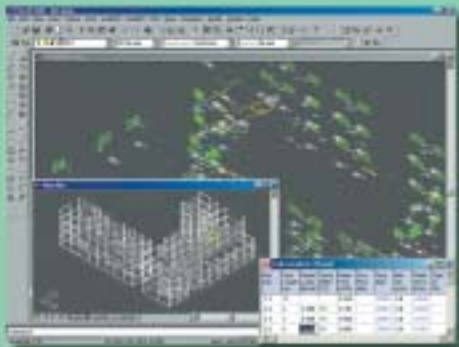
✓ Fully Automatic Calculations directly from Drawings

For each E/M Installation the program creates fully automatically, directly from the view plans drawings the complete calculation issue. In particular

Through **AutoBLD component**, the spaces are identified so that Thermal Losses, Cooling Loads and Heat Insulation are automatically calculated. This is possible even if the view plan comes from another architectural package (DWG or DXF file) or a scanner (bitmap file), thanks to the "smart" identification commands.



Through **AutoNET component**, the piping and duct networks are identified and each network is transferred with its number in the calculation sheets, where it is immediately calculated providing the complete calculation issue.



✓ Fully Automatic production of all project drawings

Vertical Charts: They are created from the view plan fully automatically and in detail. Moreover, the user is enabled to select engine-room, legends, labels etc.

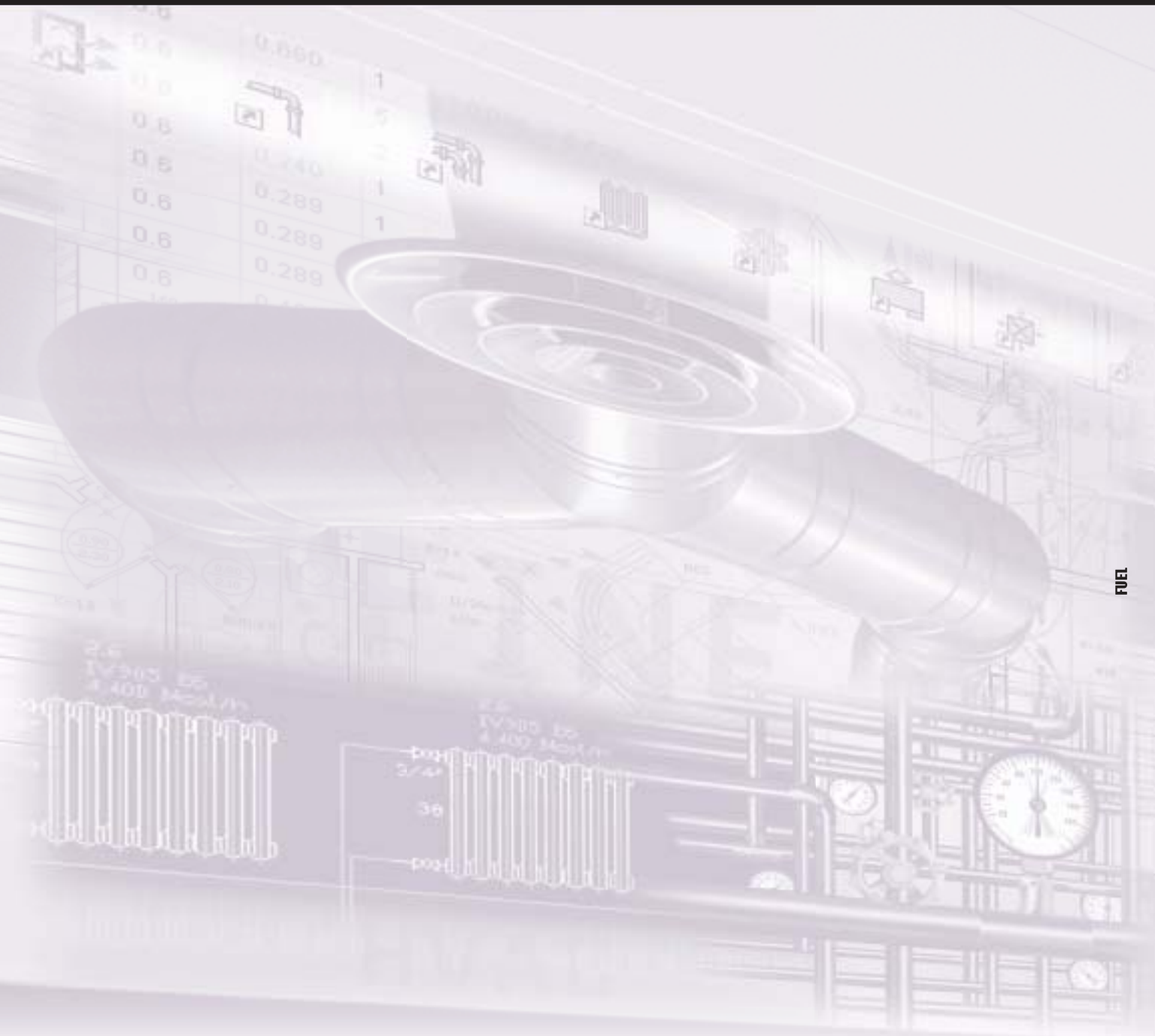


Detailed View Plan Drawings: They are created on their final form, updated from the calculation results. If needed they are automatically enriched, depending on the application (i.e. automatic conversion of the Air-duct network from linear into two-dimensional). Symbols and Designations (e.g. Single-Pipe System arrows, junction points - pipe connection circles, column direction arrows, up-down legends, comments etc) are also automatically inserted, perfecting the project drawings.



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"FINE is the Building Services Package of the Integrated 4M Suite, which supports the close cooperation among the Architect, the Civil Engineer and the Mechanical/Electrical Engineer, during all the stages of the Building design process.



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