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(71) Applicant *(for all designated States except US)*: **HELP U SOFTWARE PTY LTD** [AU/AU]; 9C/32 Frederick Street, Oatley, NSW 2223 (AU).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **ETTIA, Mark** [AU/AU]; 20 Dunstan Avenue, Milperra, NSW 2214 (AU).

(74) Agent: **YOUNG, Philip, Claude**; Chysiliou Law, 15-19 Parraween Street, Cremorne, NSW 2090 (AU).

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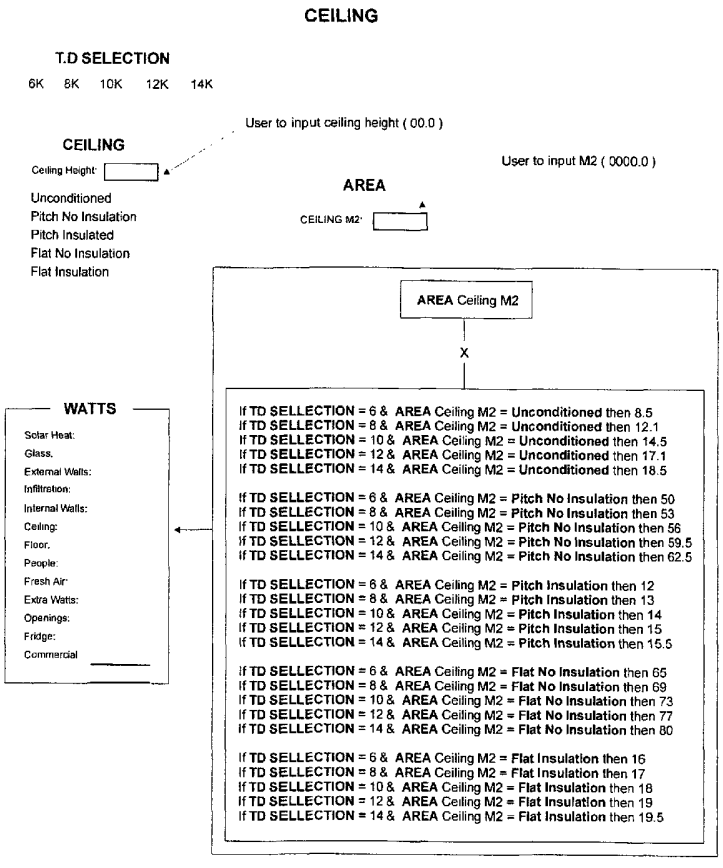
(54) Title: METHOD OF PROVIDING QUOTES ON AIR CONDITIONING SYSTEMS



(57) Abstract: A computer operated method for determining air conditioning apparatus and providing quotations for its installation is provided. The method includes the steps of: receiving inputs defining a site to be air conditioned; searching a database of heatload profiles to determine heatload requirements of the site; searching a database of equipment profiles to determine selected air conditioning equipment apparatus from predetermined plurality of equipment apparatus, said selected air conditioning equipment apparatus having characteristics to provide heatload requirements to the site; searching a database of costs associated with installation of air conditioning equipment apparatus to determine costs of that installation of said selected air conditioning equipment apparatus; and providing to a customer a quotation based on the costs of the installation of said selected air conditioning equipment apparatus.

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METHOD OF PROVIDING QUOTES ON AIR CONDITIONING SYSTEMS

This invention relates to air conditioning systems and, in particular, to a method of providing quotes for the installation of air conditioning systems including determining heatload for the installation, selecting the suppliers of the equipment to be used in the installation, determining costs of installation, providing quote to the customer.

The method of the present invention includes the use of computer software to determine the heatload and the quote in the one operation.

BACKGROUND OF THE INVENTION

The installation of air conditioning units and apparatus for buildings and the like involves the process of determining heatloads for the space to be air conditioned and selecting the equipment to be used to supply the air conditioning to that space. Following the selection of the equipment for the installation, the installer then need to determine the supplier of the selected equipment, the price of the equipment and to provide the customer with a quotation for the supply and installation of the air conditioning system.

The combination of the complexities and requirements of air conditioning design, selection and quotation, produces errors in this selection process which can lead to increased costs or loss of profits

It is therefore believed that it would be advantageous to have a computerised method which could be easily used to provide an accurate determination of the options available for installation of air conditioning units to a customer such that the quotation is a good reflection of the requirements of the customer. It is also believed that there are reduced costs in such a method which would reduce costs to the customer.

OBJECT OF THE INVENTION

It is an object of the present invention to provide a method of determining selection of air conditioning apparatus for buildings and the like the further provision of a quotation for the

installation of the apparatus. At the very least, the invention provides an alternative to presently known methods.

DISCLOSURE OF THE INVENTION

According to the present invention, there is provided a computer operated method for determining air conditioning apparatus and providing quotations for its installation, said method including the steps of: receiving inputs defining a site to be air conditioned; searching a database of heatload profiles to determine heatload requirements of the site; searching a database of equipment profiles to determine selected air conditioning equipment apparatus from predetermined plurality of equipment apparatus, said selected air conditioning equipment apparatus having characteristics to provide heatload requirements to the site; searching a database of costs associated with installation of air conditioning equipment apparatus to determine costs of that installation of said selected air conditioning equipment apparatus; and providing to a customer a quotation based on the costs of the installation of said selected air conditioning equipment apparatus

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the present invention will now be described with reference to the drawings in which:

Fig. 1 is a schematic of user inputs into software interface in respect of inputs in relation to ceiling of the site to be air conditioned showing temperature difference to determine ceiling heatload factors;

Fig. 2 is schematic of user inputs in relation to commercial factors;

Fig. 3 is a schematic of user inputs in relation to extra KW factors;

Fig. 4 is a schematic of user inputs in relation to floor factors;

Fig. 5 is a schematic of user inputs in relation to fresh air factors;

Fig. 6 is a schematic of user inputs in relation to heating calculations for ducted and split system factors;

Fig. 7 is a schematic of user inputs in relation to infiltration outside factors;

Fig. 8 is a schematic of user inputs in relation to fridge factors;

Fig. 9 is a schematic of user inputs in relation to outside wall factors;

Fig. 10 is a schematic of user inputs in relation to people factors;

Fig. 11 is a schematic of calculations for infiltration factors;

Fig. 12 is a schematic of user inputs in relation to internal wall factors;

Fig. 13 is a schematic of calculation in relation to total cooling KW for ducted systems;

Fig. 14 is a schematic of calculation in relation to total cooling KW for split systems;

Fig. 15 is a schematic of user inputs in relation to fresh air factors for cooling; and

Fig. 16 is a schematic of user inputs in relation to fresh air factors for heating.

BEST MODE OF CARRYING OUT THE INVENTION

A preferred embodiment of the present invention is a computerised method of providing a quote for customers for installation of air conditioning equipment. The system of the method uses a user interface to enter details of customers and the site to be air conditioned, to determine the air conditioning equipment to be used and to provide a costs quotation to the customer based on their requirements. The interface of the computer system uses menus such that the user is taken through a number of steps in order to provide the final quotation.

The user first has a main menu which allows them the access the part of the system to be used to provide the quote.

Quote Search:

A database of quotes is installed on the system such that the user can search for an existing quote, add a new quote or edit / change an existing quote. By pressing **Cancel** in this menu the user will return to the main menu.

Searching for a quote:

1. To search for an existing quote the user must either enter quote number in **Quote** field, customer name in **Name** field or suburb in the **Suburb** field.
2. Click the **Search** button.
3. A list of quotes will be shown below in the view window.
4. Select a quote from the list by clicking, highlighting that item and click the **Edit** button.

Adding a New Quote

1. To add a new quote, the user clicks the **Add New** button.
2. This will then take the user to the next page **Quote – Customer Search**

Quote - Customer Search

Quote Customer Search, allows the user to search for an existing customer, add a new customer or edit / change an existing customer. By pressing **Cancel** you the user will return to the main menu.

Searching for a Customer:

1. To search for an existing customer either enter a customer name in **Customer** field or suburb in the **Suburb** field or simply press the **Search** button to view the entire customer list.
2. Click the **Search** button.
3. A list of Customers will be shown below in the view window.

4. Select a customer from the list by clicking, highlighting that item and click the **Next** button.

5. This will then take the user to the next form, **Quote – Site Details**

Adding a New Customer:

1. To add a new customer, the user clicks the **New Customer** button.

2. This will take the user to the next form, **Customer Edit**

Customer Edit

Customer Edit, allows the user you to enter the customer's details e.g. Name, Address, Phone Numbers and any relevant notes.

1. Enter the customer details in the fields provided, pressing the **Tab** button to move from field to field or simply clicking your mouse into the field you wish to work in.

2. Once you have entered the information, click **Apply** to save the details.

3. Click **OK.**

Quote – Site Details

Quote Site Details, shows the selected customer and allows the user to change the site information, if required. If site details are correct the click **Next** to move to the next for, **Quote – Quote Details**

Changing Site Details:

1. Click inside any of the fields and re-type the new information required, (Name, Phone, Address and Suburb by clicking the down arrow to select the appropriate suburb).

2. Click **Next**

To move to the next for, **Quote – Quote Details**

Quote – Quote Details

Quote Details, shows the selected customer, site details, allows the user to enter the job description that will be placed on the written quote sheet and enables the user to select the one of four margin buttons which will multiply by a %, all the installation materials and labour cost content of the quote.

Entering Job Description & Margin:

1. Click inside the **Job Description** field.
2. Type in the appropriate job description i.e. Reverse Cycle Wall Mounted Split to Lounge Area. This will be added to the final printed quote sheet.
3. Click the desired Margin button.
4. Click **Next**
5. This will take the user to the next form, **Heatload – Windows**

Heatload – Windows

Heatload – Windows, allows the user to enter the appropriate cooling and heating TD factors, select glass type and insert the direction, shade type and size of glass.

1. Enter the **Cooling TD**
2. Enter the **Heating TD**
3. Select the Glass Type, **Single** or **Double**

Entering Glass Solar Heat Gain:

Solar Heat Gain window, allows the user to enter the aspect, shading properties and size of each window, if required.

1. Click the **Add** button.
2. The Window Entry form will open.
3. Select the appropriate aspect from the **Aspect** drop menu.
4. Select the shade property from the **Shade** drop menu.
5. Enter the window size in the **Size (m2)** field box.
6. Click **OK** to apply glass details.

If more then one window is required then repeat step 1 through step 6.

7. To finish Window Entry Click **Next**
8. This will then take you to the next form, **Heatload – Walls**

Editing Window Entry:

Editing Windows Entry, allows you to change the **Aspect, Shade** or **Size (m2)** of any individual window entry.

1. Click and highlight the entry you wish to edit.
2. Click the **Edit** button.
3. Change the relevant item or items.
4. Click **OK**
7. To finish Window Editing Click **Next**
8. This will then take you to the next form, **Heatload – Walls**

Heatload – Walls

Heatload – Walls, allows the user to enter the total length of external walls and the construction type, the total length of internal walls and any openings such as doorways or archways.

Walls & Openings:

1. Enter the total length of external walls in meters, inside the **Length (m)** field box.
2. Select the construction of the walls e.g. Brick Veneer or Weatherboard.
3. Enter the total length of internal walls in meters, inside the **Length (m)** field box.
4. Enter the total opening size of any doorways or archways in the **Openings (m2)** field box.
5. Click **Next**
6. This will then take you to the next form, **Heatload – Ceiling**

Heatload – Ceiling

Heatload – Ceiling, allows the user to enter the total area of the ceiling (floor area), the height of the ceiling and the ceiling type (what's above).

Entering Ceilings:

1. Enter the total area of the ceiling in the **Area (m2)** field box.

2. Enter the ceiling height e.g. 2.4 in the **Height** field box.
3. Select the appropriate ceiling type e.g. Pitched Roof Insulated.
4. Click **Next**
5. This will then take you to the next form, **Heatload – Floor & People**

Heatload – Floor & People

Heatload – Floor & People, allows the user to enter what's below the floor e.g. Concrete Slab or Enclosed Below. The People field, allows the user to enter the number of people that will occupy the proposed area on an average basis and the type of activity for that area.

Entering Floor & People:

1. Select the appropriate floor type.
2. Enter the number of people.
3. Select the activity type.
4. Click **Next**
5. This will then take you to the next form, **Heatload – Others** page 1.09

Heatload – Others

Heatload – Others, allows the user you to enter a fridge that is in the proposed area, select the TD of fresh air intake, any extra kW to be added to the total load and a commercial section that allows the input of Computers, Lights, Copiers and Hot Water Boilers.

Entering Others:

1. Select **Fridge** if required.
2. Select the TD of **Fresh Air** by clicking the appropriate TD e.g. 10K.
3. Enter any extra kW's in the **Extra KiloWatts** field e.g. 1.5kW which represents 1,500 watts
4. Select lights by clicking the **Lights** field button.
5. Enter the total number of computers in the **Computers** field box.

6. Enter the total numbers of Copiers in the **Copiers** field box.
7. Enter the total number of boilers in the **Hot Water Boilers** field box.
8. Click **Next**
9. This will then take you to the next form, **Heatload – Summary**

Heatload – Summary

Heatload – Summary, allows the user to view the complete heatload and items that have been selected. Any changes that need to be made, can be done by clicking the **Back** button which will take the user to any of the forms that require changing.

This Heatload Summary Report can also be printed, by clicking the **Print** button. This will produce an itemized A4 printed sheet of the selection.

Saving the Heatload Summary:

1. Press the **Save** button to save and store your calculations.
2. Press the **Print** button to view the heatload summary report.
3. After you have saved and viewed or printed your summary press **Next** to go to the next form, **Quotes – Units**
4. By pressing the **Cancel** button the user can return back to the **Main Menu.**

Printing the Heatload Summary Report:

1. Press the **Print** button.
2. The print dialog box will open.
3. Click **Print** or select a new printer by dropping down **Printer** field.
4. Select a new printer and click **Print.**
5. After you have finished viewing or printing your report, click the close button marked **X** located at the top right-hand of the print report page. This will take the user back to the heatload summary page.
6. Pressing **Next** will take you to the next form, **Quote – Units** or pressing the **Cancel** button will return the user back to the **Main Menu.**

Quote Units:

Quote Units, allows the user to select a unit, by supplier and or type of unit that matches the Heatload calculation. The total cooling, heating and night load can be viewed and the user can enter the proposed condenser location. Quote Units, will select a unit or units that match the Heatload calculation within a –10% to +20% range.

Searching by Supplier:

1. Click the down arrow in the **Supplier** field box.
2. Select a desired supplier.
3. Click the **Search** button

Searching by Type:

1. Click the down arrow in the **Type** field box.
2. Select a desired unit type.
3. Click the **Search** button

Entering Condenser Location:

Quote Units – Condenser Location, allows the user to enter the location of the proposed outdoor unit which will be entered onto the final printed quotation page.

Selecting the Desired Unit:

Quote Units Viewing window will show a list of appropriate units that match the Heatload calculation. Selecting a unit from this list will automatically enter it into your quotation.

1. Select the desired unit by clicking onto it to highlight the item.
2. Press **Next**, this will then take you to the next form, **Quote – Labour/Materials**

Quote Labour / Materials

Quote Labour / Materials, allows the user to input, select or change the installation price of the quotation. The user also has an option of including or excluding the electrical part of the quote along with the option of which type of trunking to allow for.

Entering / Editing Labour Price:

1. Click into the **Labour** field box.

2. Backspace, delete or simply type over the default price.

Excluding / Including Electrical Price:

1. To include the electrical price in your quote the **Excluding Electrical** field box must be left blank.

2. To exclude the electrical price in your quote, Click into the **Excluding Electrical** Field box, a tick will represent that field as selected.

Entering Trunking Colour:

1. Click the down arrow in the **Trunking Colour** field box.

2. Select a desired trunking colour by clicking onto that item.

Materials Default Window:

The Materials Window will automatically default to a basic back to back installation with the necessary materials to complete the quote. The Materials window allows the user to enter new materials, edit and or remove items from the quote.

Adding to Materials Window:

1. Click the **Add** button located below the Materials Window.
2. Click the drop down menu arrow in the **Materials** field
3. Highlight the appropriate item you wish to add to your quote by clicking onto it.
4. Press **OK** to add that item to your quote window

Editing Items from the Materials Window:

1. Highlight the item you wish to edit.

2. Click the **Edit** button located below the Materials Window.

3. Click into the field you wish to change and make the required changes.

4. Click **OK** to return back to the Materials Window.

5. Click **Next** to go to the next form, **Quote – Terms**

Quote – Terms

Quote – Terms, allows the user to select a Firm or Budget price, who's Proposal it is, the user's or the customers, if the Site was inspected or quoting from Drawings, the Terms of Payment required, any Notes that are needed in the quotation can be added and items that need to be excluded in your quote.

1. If a **Budget re Installation** is required then click inside the field box, a tick will show that item as selected.
2. If a **Budget re Electrical** is required then click inside the field box, a tick will show that item as selected.
3. Select which **Proposal** is required by clicking inside the field circle, a dot will show that item as selected.
4. Select what type of **Inspection** was carried out by clicking inside the field circle, a dot will show that item as selected.
5. Select which **Payment Terms** is required by clicking inside one of the 5 field circles, a dot will show that item as selected.
6. Type inside the **Notes** window if additional information is require for your quote.
7. Type inside the **Exclusions** window if extra items need to be excluded in your quote.
8. Click **Next** to move onto the next form, **Quote – Summary**

Quote – Summary

Quote – Summary, allows the user to view the selections, customer details, price quoted, kW requirement, unit selected, selected materials and terms of payment.

Saving your Quote:

1. To save the quote press **Save.**
2. Press **Finish** to complete the quote or press **Print** to view the quote report.
3. To print the quote report press **Print.**
4. To close the **Print** report click the close button at the top right-hand of the page, marked **X**
5. This will return the user back to the **Quote Summary** page.
6. To finish the quote press **Finish** to return you back to the **Main Menu** or press **Cancel** to close and end this session.

Quote – Ducting

Quote – Ducting, allows the user to select what type of Outlets are being used, the location of the indoor fan coil unit, shows the selected HP of the unit, allows the user to enter the description and grill quantity of each zone with continuous options if required.

1. Select the type of **Outlets** required by clicking inside one of the three field circles, a dot will show that item as selected.
2. Select the location of the indoor unit by clicking inside one of the two field circles, a dot will show that item as selected.

Entering Zones:

1. Press the **Add** button, to open the **Zone Edit** window.
2. Enter the location of the grilles in the **Location** window.
3. Enter the number of grilles to be used for that zone in the **Outlets** window.
4. Press **OK** to return back to the Quote – Ducting form.

Note: To enter another zone, simply repeat step 1. through to step 4.

Editing Zones:

1. Select the desired zone to be edited by clicking onto that zone inside the **Zones** window.
2. Press the **Edit** button to open the **Zone Entry** form.
3. Edit the **Location** or **Outlets** field by re-typing over.
4. Press **OK** to return back to the **Quote – Ducting** form.
5. Press **Next** to continue to the next form, **Quote – Labour/Materials**

Removing Zones:

The **Remove** button will allow the user to remove any one of the zones inside the **Zones** window.

1. Select the desired zone to be removed by clicking onto it.
2. Press **Remove** to delete the selected zone.

Note: If all the zones are deleted then the program will not allow you to continue to the next form.

Selecting Continuous:

Continuous, will allow the user to nominate which area will be a continuous area.

1. Click inside the **Continuous** field box, a tick will show that item as selected.
2. Enter the location of your continuous area inside the **Continuous** field window.
3. Press **Next** to continue to the next form, **Quote – Labour/Materials**

Contractors

Contractors, allowsthe user to **Search** for a contractor, **Edit** an existing Contractor or **Add** a New Contractor to the list.

Searching Contractors:

1. To search for an existing contractor either enter a Contractors name in **Company** field box or simply press the **Search** button to view the entire contractors list.
2. Select the desired contractor by clicking and highlighting that name.
3. Press the **Edit** button to open the **Contractor Edit** form to view the contractor's details.
4. Press **OK** to complete and to return back to **Contractors** form.
5. Press **Cancel** to return back to the **Admin Menu.**

Editing a Contractors:

1. To search for an existing contractor either enter a Contractors name in **Company** field box or simply press the **Search** button to view the entire contractors list.
2. Select the desired contractor by clicking and highlighting that name.
3. Press the **Edit** button to open the **Contractor Edit.**
4. Make the desired changes by highlighting inside the field an re-typing new.
5. Press **Apply** to save the changes.
6. Press **OK** to complete and to return back to **Contractors** form.
7. Press **Cancel** to return back to the **Admin Menu.**

Adding a New Contractor:

1. Press the **Add New** button to open the **Contractor Edit** form.

2. Enter the details by clicking inside the fields and typing your details.
3. Press **Apply** to save the changes.
4. Press **OK** to complete and to return back to **Contractors** form.
5. Press **Cancel** to return back to the **Admin Menu**

Materials:

Materials, allows the user to **Search** and **Edit** existing materials or **Add** new material details.

Searching Materials:

1. To search for an existing material, either enter a material name in **Materials** field box or simply press the **Search** button to view the entire materials list.
2. Select the desired item by clicking and highlighting that name.
3. Press the **Edit** button to open the **Material Edit** form to view the materials details.
4. Press **OK** to complete and to return back to **Materials** form.
5. Press **Cancel** to return back to the **Admin Menu.**

Editing Materials:

1. To Edit an existing material, either enter a material name in **Materials** field box or simply press the **Search** button to view the entire materials list.
2. Select the desired item by clicking and highlighting that name.
3. Press the **Edit** button to open the **Material Edit** Form.
4. Make the desired changes by highlighting inside the field and re-typing new.
5. Press **Apply** to save the changes.
6. Press **OK** to complete and to return back to **Materials** form.
7. Press **Cancel** to return back to the **Admin Menu**

Adding a New Materials:

1. Press the **Add New** button to open the **Materials Edit** form.
2. Enter the details by clicking inside the fields and typing your details.

3. Press **Apply** to save the changes.

4. Press **OK** to complete and to return back to **Material** form.

5. Press **Cancel** to return back to the **Admin Menu**

Suburb:

Suburbs, allows the user to Search and Edit Suburb details, or Add new Suburbs.

Searching Suburb:

1. To search for an existing suburb either enter a suburb name in **Suburb** field box or simply press the **Search** button to view the entire customer list.

2. Select the desired suburb by clicking and highlighting that name.

3. Press the **Edit** button to open the **Suburb Edit** form to view the suburb details.

4. Press **OK** to complete and to return back to **Suburb** form.

5. Press **Cancel** to return back to the **Admin Menu.**

Editing a Suburb:

1. To edit an existing suburb either enter a suburb name in **Suburb** field box or simply press the **Search** button to view the entire customer list.

2. Select the desired suburb by clicking and highlighting that name.

3. Press the **Edit** button to open the **Suburb Edit** Form.

4. Make the desired changes by highlighting inside the field an re-typing new

5. Press **Apply** to save the changes.

6. Press **OK** to complete and to return back to **Suburb** form.

7. Press **Cancel** to return back to the **Admin Menu**

Adding a New Suburb:

1. Press the **Add New** button to open the **Suburb Edit** form.

2. Enter the details by clicking inside the fields and typing your details.

3. Press **Apply** to save the changes.

4. Press **OK** to complete and to return back to **Suburb** form.

5. Press **Cancel** to return back to the **Admin Menu**

Customer.

Customers, allows the user to **Search** for a Customer and **Edit**, or **Add New** Customers.

Searching Customer:

1. To search for an existing customer either enter a customer name in **Customer** field or suburb in the **Suburb** field box or simply press the **Search** button to view the entire customer list.
2. Select the desired item by clicking and highlighting that name.
3. Press the **Edit** button to open the **Customer Edit** form to view the customers details.
4. Press **OK** to complete and to return back to **Customer** form.
5. Press **Cancel** to return back to the **Admin Menu.**

Editing a Customer:

1. To edit an existing customer either enter a customer name in **Customer** field or suburb in the **Suburb** field box or simply press the **Search** button to view the entire customer list
2. Select the desired customer by clicking and highlighting that name.
3. Press the **Edit** button to open the **Customer Edit** Form.
4. Make the desired changes by highlighting inside the field an re-typing new.
5. Press **Apply** to save the changes.
6. Press **OK** to complete and to return back to **Customer** form.
7. Press **Cancel** to return back to the **Admin Menu**

Adding a New Customer:

1. Press the **Add New** button to open the **Customer Edit** form.
2. Enter the details by clicking inside the fields and typing your details.
3. Press **Apply** to save the changes.

4. Press **OK** to complete and to return back to **Customer** form.

5. Press **Cancel** to return back to the **Admin Menu**

Ducting Search.

Ducting Search, allows the user to **Search** for ducting details, **Edit** an existing ducting detail or **Add** a New ducting price and details to your list.

Searching Ducting:

1. To search for an existing ducting layout or price, either enter a HP size name in the **HP** field, zone quantity in the **Zones** Field box, number of outlets in the **Outlets** field box simply press the **Search** button to view the entire ducting list.
2. Select the desired item by clicking and highlighting that name.
3. Press the **Edit** button to open the **Ducting Price** form to view the ducting price details.
4. Press **OK** to complete and to return back to **Ducting Search** form.
5. Press **Cancel** to return back to the **Admin Menu.**

Editing Ducting:

1. To edit an existing ducting layout or price, either enter a HP size name in the **HP** field, zone quantity in the **Zones** Field box, number of outlets in the **Outlets** field box simply press the **Search** button to view the entire ducting list.
2. Select the desired item by clicking and highlighting that item.
3. Press the **Edit** button to open the **Ducting Price** Form.
4. Make the desired changes by highlighting inside the field an re-typing new.
5. Press **Apply** to save the changes.
6. Press **OK** to complete and to return back to **Ducting Search** form.
7. Press **Cancel** to return back to the **Admin Menu**

Adding New Ducting:

1. Press the **Add New** button to open the **Ducting Price** form.
2. Enter the details by clicking inside the fields and typing your details.
3. Press **Apply** to save the changes.

4. Press **OK** to complete and to return back to **Ducting Search** form.

5. Press **Cancel** to return back to the **Admin Menu**

Units.

Units, allows the user to **Search** for a Product, **Add** products to your list, **Edit** details and prices from the existing list.

Product Search:

6. To search for a unit, either select a **Supplier** from the drop down menu list, select the type of unit from the **Type** drop down list, enter the HP in the **HP** field box, enter the cooling kW capacity in the **kW** field box or simply press the **Search** button to view the entire list.

7. Select the desired item by clicking and highlighting that name.

8. Press the **Edit** button to open the **Air Conditioning Unit Edit** form to view the unit details.

9. Press **OK** to complete and to return back to **Product Search** form.

10. Press **Cancel** to return back to the **Admin Menu.**

Editing Unit:

11. To edit an existing unit detail from your list, either select a **Supplier** from the drop down menu list, select the type of unit from the **Type** drop down list, enter the HP in the **HP** field box, enter the cooling kW capacity in the **kW** field box or simply press the **Search** button to view the entire unit list.
12. Select the desired item by clicking and highlighting that name..

13. Press the **Edit** button to open the **Air Conditioner Unit Edit** Form.

14. Make the desired changes by highlighting inside the field an re-typing new.

15. Press **Apply** to save the changes.

16. Press **OK** to complete and to return back to **Product Search** form.

17. Press **Cancel** to return back to the **Admin Menu**

Adding New Unit:

18. Press the **Add New** button to open the **Air Conditioning Unit Edit** form.

19. Enter the details by clicking inside the fields and typing your details.

20. Press **Apply** to save the changes.

21. Press **OK** to complete and to return back to **Product Search** form.

22. Press **Cancel** to return back to the **Admin Menu**

Settings:

Settings, allows the user to set a Default $ amount for Labour and Electrical work for all installations, except for the ducted price.

Editing Default Settings:

1. Double Click inside the **Default Amount** field box to highlight the amount and re-type to new.
2. Double Click inside the **10 amp Cost** field box to highlight the amount and re-type to new.
3. Double Click inside the **20 amp Cost** field box to highlight the amount and re-type to new.
4. Double Click inside the **3 Phase Cost** field box to highlight the amount and re-type to new.
5. Press the **Apply** button to save your settings.
6. Press **OK** to return back to the **Admin Menu.**

Margin:

Margins, allows the user to pre set from FOUR (4) Margin Headings and Profit Margins for all the materials installation section of your quote. **Note:** This will only affect the materials section of the split type quotes and the extra materials section of the ducted quotes but not the main ducting component pricing.

Editing Margin List:

1. To edit the **Margin List** items, simply double click inside the field or fields you wish to edit, highlighting the item and re-type to new.

2. When completed press the **Apply** button to save your settings.

3. Press **OK** to return back to the **Admin Menu.**

Suppliers:

Supplier, allows the user to **Search** for a supplier, **Edit** an existing supplier or **Add** a New supplier to your list.

Searching Suppliers:

1. To search for an existing supplier either enter a supplier name in **Company** field box or simply press the **Search** button to view the entire suppliers list.
2. Select the desired supplier by clicking and highlighting that name.
3. Press the **Edit** button to open the **Supplier Edit** form to view the supplier's details.
4. Press **OK** to complete and to return back to **Suppliers** form.
5. Press **Cancel** to return back to the **Admin Menu.**

Editing Suppliers:

1. To search for an existing supplier either enter a supplier's name in **Company** field box or simply press the **Search** button to view the entire suppliers list.
2. Select the desired supplier by clicking and highlighting that name.
3. Press the **Edit** button to open the **Supplier Edit.**
4. Make the desired changes by highlighting inside the field an re-typing new.
5. Press **Apply** to save the changes.
6. Press **OK** to complete and to return back to **Suppliers** form.
7. Press **Cancel** to return back to the **Admin Menu.**

Adding a New Supplier:

1. Press the **Add New** button to open the **Supplier Edit** form.
2. Enter the details by clicking inside the fields and typing your details.
3. Press **Apply** to save the changes.
4. Press **OK** to complete and to return back to **Suppliers** form.
5. Press **Cancel** to return back to the **Admin Menu**

The foregoing description describes the procedures involved with obtaining a quote using the preferred embodiment. The user interface allows the user to enter the relevant details needed to provide the quote for the customer. The program has the following preferred features whereby the data can be entered into the appropriate menu forms wherein the Admin Menu allows the user to select from nine different types of forms. From this

Admin menu, the user can click onto one of the Icons and view, add or edit any data within the selected form.

The Margin List form, allows the user to pre set a list of four margin settings and its description. This has been designed to allow the user to keep the margins discreet, when quoting on site. The description field is shown on the **Quote – Quote Details**, for example, the user may choose to enter a name (Salesman 1, Salesman 2, Salesman 3 and Salesman 4) or letters, (A, B, C and D). The **Margin** fields allows the user to enter the selected percentage mark-up amount, this can only be viewed from the **Margin List.** The margin amount placed in the **Margin** fields will only affect the materials prices for the split type quotes and the extra materials, when added to the ducted type quotes on the **Quote – Labour/Materials.**

When entering the data, it is noted that Temperature Difference is the ambient Dry Bulb temperature, less the desired inside room temperature for Comfort and Non Critical Process, during Summer, and the inside required temperature less the ambient for Winter. It is suggested that the user use the AIRAH Hand Book for the figures for their particular area.

For example, the design temperature for Sydney C.B.D. (City Business District), coastal and surrounding local areas is 31.1° C DB ambient in Summer and 6.0° C DB in Winter, if say 23° C is chosen as the inside temperature in Summer the TD would be 31.1° C minus 23.0° C DB = 8.1° C TD, in Winter if 22.0° C is chosen as the inside temperature it would be 22.0° C minus 6.0° C = 16.0° C TD.

The program has the following optional range of "TD", and the user can select from the following:
Cooling loads have a selection range of 6K to 14K
Heating loads have a selection range of 12K to 26K

When determining shading the site may have a number of windows facing the same way, with different shading. The program allows any number of entries to suit the applications.

Some windows may be shaded only part of the time, and it is suggested that the worst case is selected.

Nil Shading = No Shading.
Inside Shading = Light colored Venetians as a minimum.
Outside Shading = Ventilated awnings, no sun on windows.

The program automatically selects the greater of the AM or PM loads, the user may choose to ignore the AM load and only use the PM load or vice-versa. To achieve this the user will need to check the loads after they have completed the "window" calculations and reduce or increase the sensible load by the difference in the AM and PM loads. The total sensible result must now be recalculated by multiplying the sensible load x 1.35 for Split units and x 1.30 for Ducted units to arrive at the Total Cooling required. The program automatically calculates the window heat transmission for cooling and heating.

The program has the facility to calculate loss and gains from adjacent un-air conditioned areas, such as through permanently open doors, archways and stair openings. The opening area is to be measured and the data is to be entered in square meters in the (Openings M2) . For your information this is based on 450 watts per square meter.

If fresh air is brought into the through the system Fresh Air (Cooling TD) is to be selected, this is normally only used in Commercial and Industrial applications. The calculation is based on 10 l/s per person.

If lights are in operation all the time the user should select lights, such as an Office or Commercial premises. The calculation is based on 20 watts per square meter.

If computers are in the area, the number of PC's are entered. The program calculates the additional load on the basis of 300 watts per PC.

If photocopiers are in the area, the number of PC's are entered. The program calculates the additional load on the basis of 1000 watts per copier.

It is becoming common for Offices and Commercial areas to have a small Hot Water Boiler installed in the conditioned area. If so the number of Hot Water Boilers is entered and the program will calculate the load on the basis of 1,000 watts per machine.

The user also has the opportunity of adding extra capacity for odd items like a larger than normal lighting load, kitchen exhaust or any extra heat producing equipment. If the Kitchen area has heavy use or is a Commercial type Kitchen the user will need to calculate the additional load (heat emission plus ventilation) and enter this data in the "Extra kW" facility.

Exhaust Example: L/s x Factor = kW

Factors:
6 TD= 7.3
10 TD= 12
12 TD= 14.4
14 TD= 16.8
16 TD= 19.2

These arrangements of the program are illustrated in respect of the drawings which show the various data to be entered and some of the calculations performed by the program. The factors for the variables of the site are entered as required as seen in the drawings.

The foregoing describes only some embodiments of the present invention, and modifications obvious to those skilled in the art can be made thereto without departing from the scope of the present invention.

CLAIMS

1. A computer operated method for determining air conditioning apparatus and providing quotations for its installation, said method including the steps of: receiving inputs defining a site to be air conditioned; searching a database of heatload profiles to determine heatload requirements of the site; searching a database of equipment profiles to determine selected air conditioning equipment apparatus from predetermined plurality of equipment apparatus, said selected air conditioning equipment apparatus having characteristics to provide heatload requirements to the site; searching a database of costs associated with installation of air conditioning equipment apparatus to determine costs of that installation of said selected air conditioning equipment apparatus; and providing to a customer a quotation based on the costs of the installation of said selected air conditioning equipment apparatus.

2. The method of claim 1, wherein the inputs defining a site include the type of apparatus to be installed.

3. The method of claim 2, wherein the inputs further includes appropriate cooling and heating temperature difference factors to be used for windows, glass type, direction, shade type and size of glass; heatload for walls, including total length of external walls, construction type, total length of internal walls, number of openings and type of openings, heatload of ceilings including total area of ceilings, height of ceilings, type of ceilings; heatload of floor and people, including floor type, number of people, activity type, and heatload of other equipments, .

4. The method of claim 3, wherein the equipment profiles includes databases relating to suppliers and types of systems.

5. The method of claim 4, further including entering details of margin to be realised and the costs associated with labour for installation of the system.

6. The method of claim 4, further including the steps of adding new customers, suppliers, equipment into the databases.

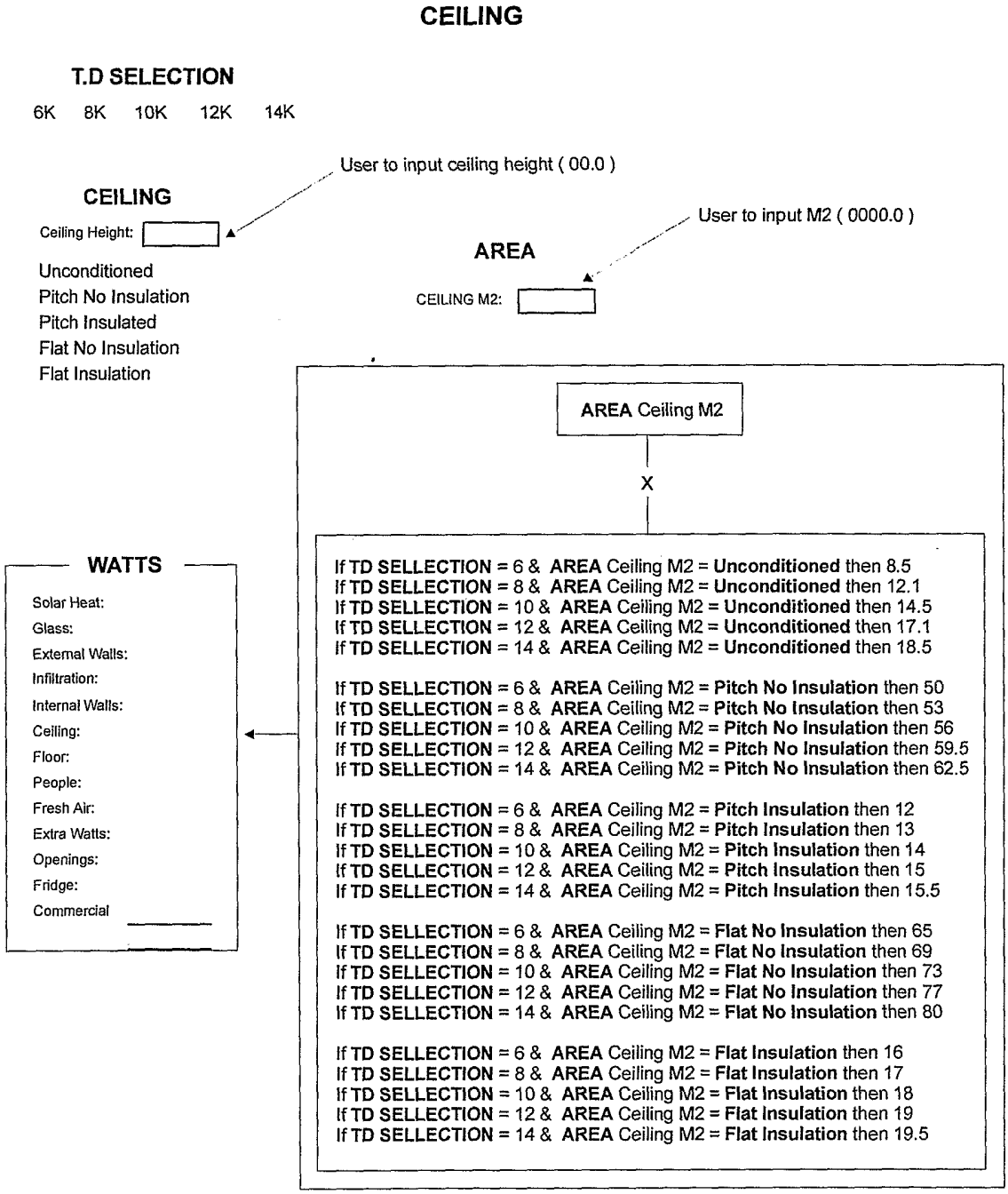

CEILING
T.D SELECTION
6K 8K 10K 12K 14K
User to input ceiling height (00.0)
CEILING
Ceiling Height:
Unconditioned
Pitch No Insulation
Pitch Insulated
Flat No Insulation
Flat Insulation
User to input M2 (0000.0)
AREA
CEILING M2:
AREA Ceiling M2
X
WATTS
Solar Heat:
Glass:
External Walls:
Infiltration:
Internal Walls:
Ceiling:
Floor:
People:
Fresh Air:
Extra Watts:
Openings:
Fridge:
Commercial
If TD SELLECTION = 6 & AREA Ceiling M2 = Unconditioned then 8.5
If TD SELLECTION = 8 & AREA Ceiling M2 = Unconditioned then 12.1
If TD SELLECTION = 10 & AREA Ceiling M2 = Unconditioned then 14.5
If TD SELLECTION = 12 & AREA Ceiling M2 = Unconditioned then 17.1
If TD SELLECTION = 14 & AREA Ceiling M2 = Unconditioned then 18.5
If TD SELLECTION = 6 & AREA Ceiling M2 = Pitch No Insulation then 50
If TD SELLECTION = 8 & AREA Ceiling M2 = Pitch No Insulation then 53
If TD SELLECTION = 10 & AREA Ceiling M2 = Pitch No Insulation then 56
If TD SELLECTION = 12 & AREA Ceiling M2 = Pitch No Insulation then 59.5
If TD SELLECTION = 14 & AREA Ceiling M2 = Pitch No Insulation then 62.5
If TD SELLECTION = 6 & AREA Ceiling M2 = Pitch Insulation then 12
If TD SELLECTION = 8 & AREA Ceiling M2 = Pitch Insulation then 13
If TD SELLECTION = 10 & AREA Ceiling M2 = Pitch Insulation then 14
If TD SELLECTION = 12 & AREA Ceiling M2 = Pitch Insulation then 15
If TD SELLECTION = 14 & AREA Ceiling M2 = Pitch Insulation then 15.5
If TD SELLECTION = 6 & AREA Ceiling M2 = Flat No Insulation then 65
If TD SELLECTION = 8 & AREA Ceiling M2 = Flat No Insulation then 69
If TD SELLECTION = 10 & AREA Ceiling M2 = Flat No Insulation then 73
If TD SELLECTION = 12 & AREA Ceiling M2 = Flat No Insulation then 77
If TD SELLECTION = 14 & AREA Ceiling M2 = Flat No Insulation then 80
If TD SELLECTION = 6 & AREA Ceiling M2 = Flat Insulation then 16
If TD SELLECTION = 8 & AREA Ceiling M2 = Flat Insulation then 17
If TD SELLECTION = 10 & AREA Ceiling M2 = Flat Insulation then 18
If TD SELLECTION = 12 & AREA Ceiling M2 = Flat Insulation then 19
If TD SELLECTION = 14 & AREA Ceiling M2 = Flat Insulation then 19.5

Fig. 1

COMMERCIAL

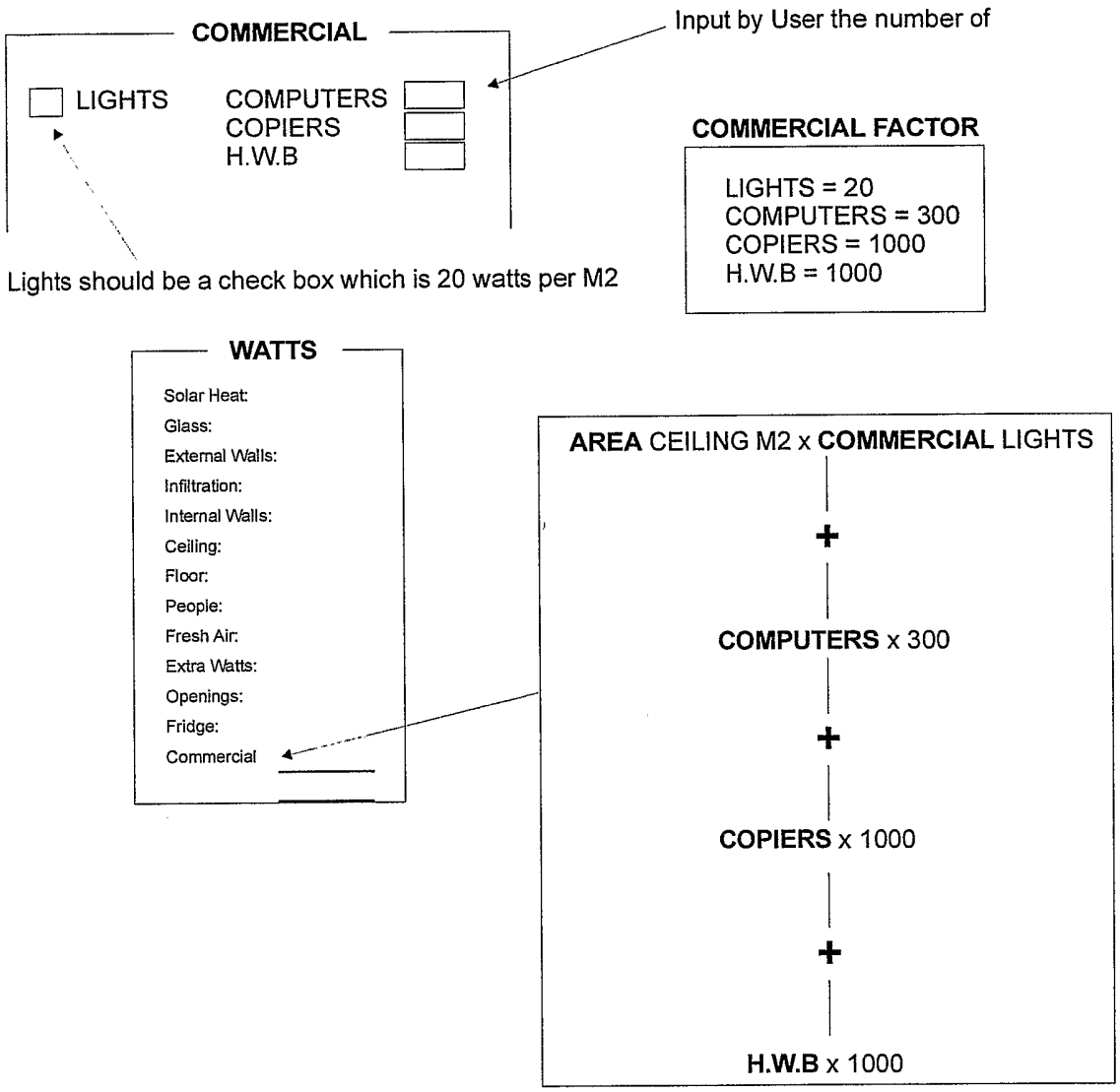


Fig. 2

EXTRA KW

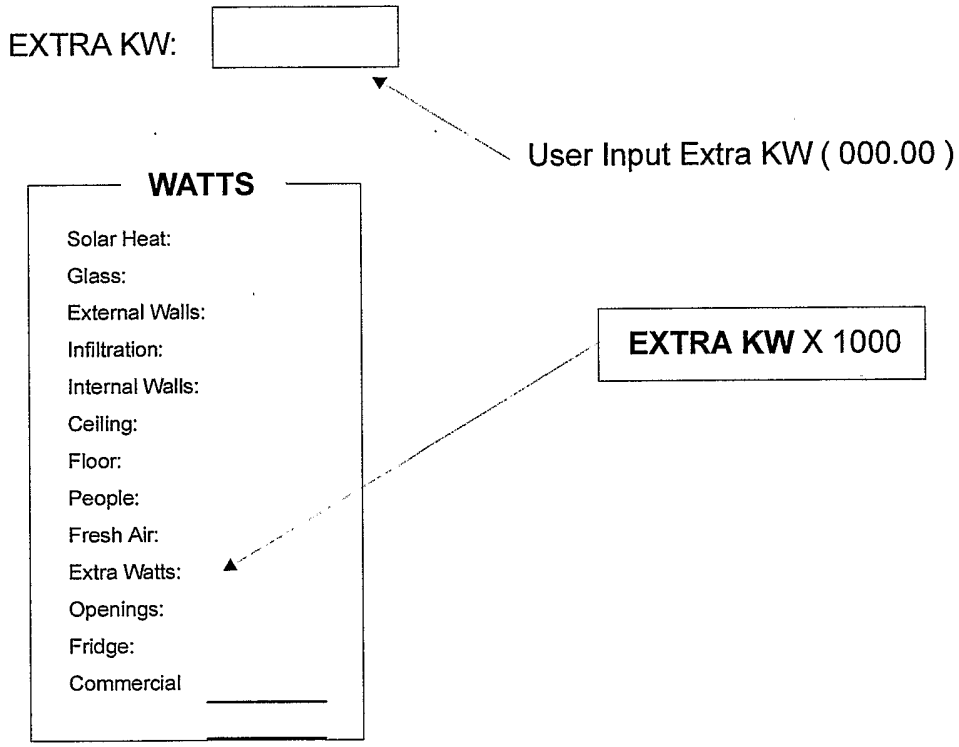


Fig. 3

FLOORS

T.D SELECTION

6K 8K 10K 12K 14K

FLOOR

Uncondition below
Enclosed Space
Ventilated Space
Concrete Slab

FLOOR FACTOR

If **TD SELECTION** = 6 and **FLOOR FACTOR** = Unconditioned Below then 6.5
If **TD SELECTION** = 8 and **FLOOR FACTOR** = Unconditioned Below then 9
If **TD SELECTION** = 10 and **FLOOR FACTOR** = Unconditioned Below then 12
If **TD SELECTION** = 12 and **FLOOR FACTOR** = Unconditioned Below then 14.5
If **TD SELECTION** = 14 and **FLOOR FACTOR** = Unconditioned Below then 17

If **TD SELECTION** = 6 and **FLOOR FACTOR** = Enclosed Space then 1
If **TD SELECTION** = 8 and **FLOOR FACTOR** = Enclosed Space then 1
If **TD SELECTION** = 10 and **FLOOR FACTOR** = Enclosed Space then 1
If **TD SELECTION** = 12 and **FLOOR FACTOR** = Enclosed Space then 1
If **TD SELECTION** = 14 and **FLOOR FACTOR** = Enclosed Space then 1.5

If **TD SELECTION** = 6 and **FLOOR FACTOR** = Ventilated Space then 8.5
If **TD SELECTION** = 8 and **FLOOR FACTOR** = Ventilated Space then 12
If **TD SELECTION** = 10 and **FLOOR FACTOR** = Ventilated Space then 15.5
If **TD SELECTION** = 12 and **FLOOR FACTOR** = Ventilated Space then 19
If **TD SELECTION** = 14 and **FLOOR FACTOR** = Ventilated Space then 22

If **TD SELECTION** = 6 and **FLOOR FACTOR** = Concrete Slab then 0
If **TD SELECTION** = 8 and **FLOOR FACTOR** = Ventilated Space then 0
If **TD SELECTION** = 10 and **FLOOR FACTOR** = Ventilated Space then 0
If **TD SELECTION** = 12 and **FLOOR FACTOR** = Ventilated Space then 0
If **TD SELECTION** = 14 and **FLOOR FACTOR** = Ventilated Space then 0

AREA

CEILING M2: [ ]

WATTS

Solar Heat:
Glass:
External Walls:
Infiltration:
Internal Walls:
Ceiling:
Floor:
People:
Fresh Air:
Extra Watts:
Openings:
Fridge:
Commercial

AREA CEILING M2

X

FLOOR FACTOR

Fig. 4

FRESH AIR

* = Changes made

NOTE:

The fresh air will now be automatically linked to the Cooling TD. With a tick selection box. Please see FRESH AIR FACTORS FOR COOLING AND HEATING.

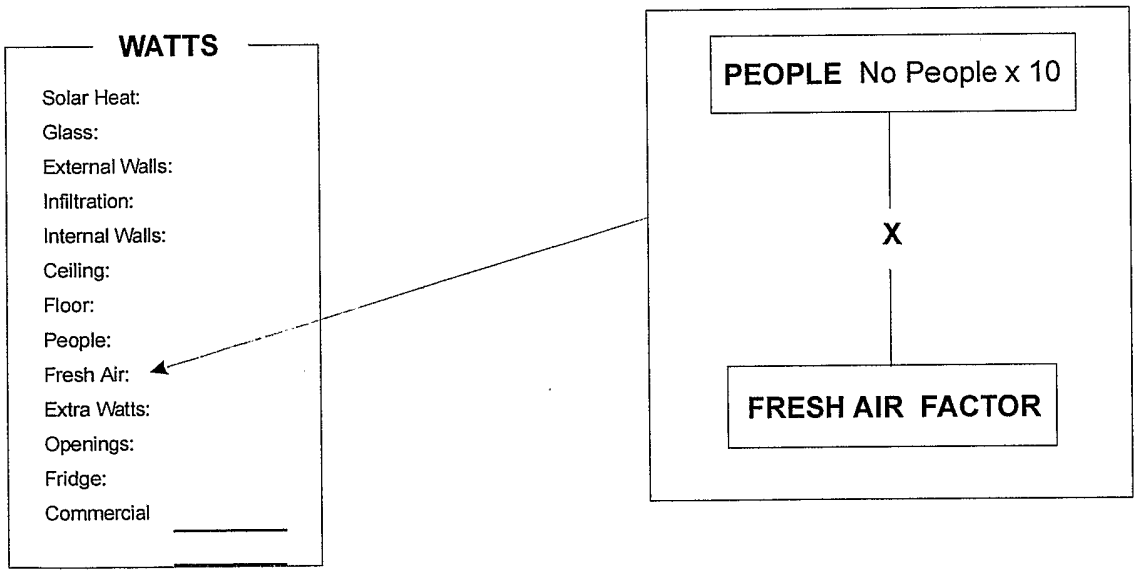


Fig. 5

HEATING CALCULATION FOR DUCTED & SPLIT

* =Changes made

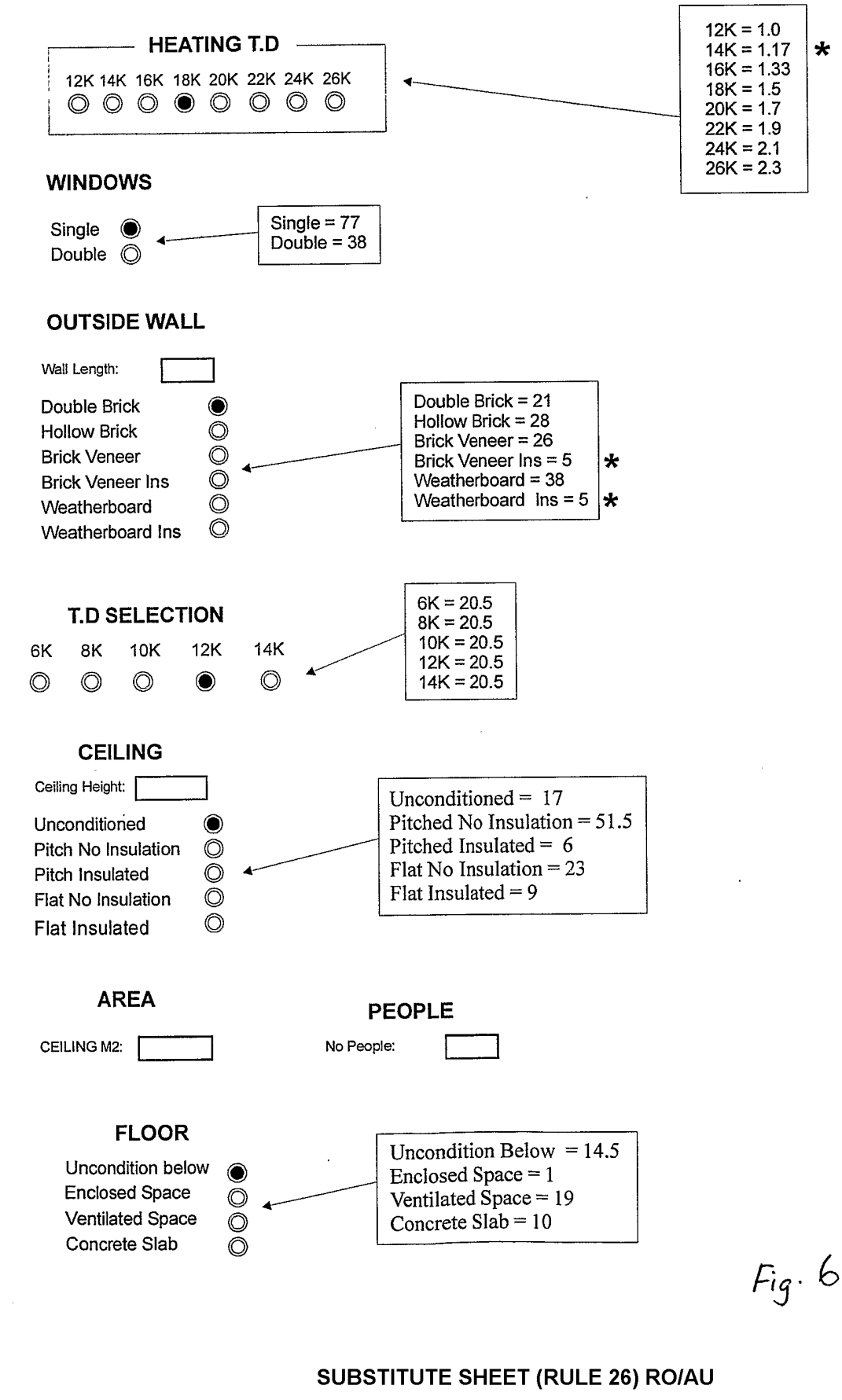


Fig. 6

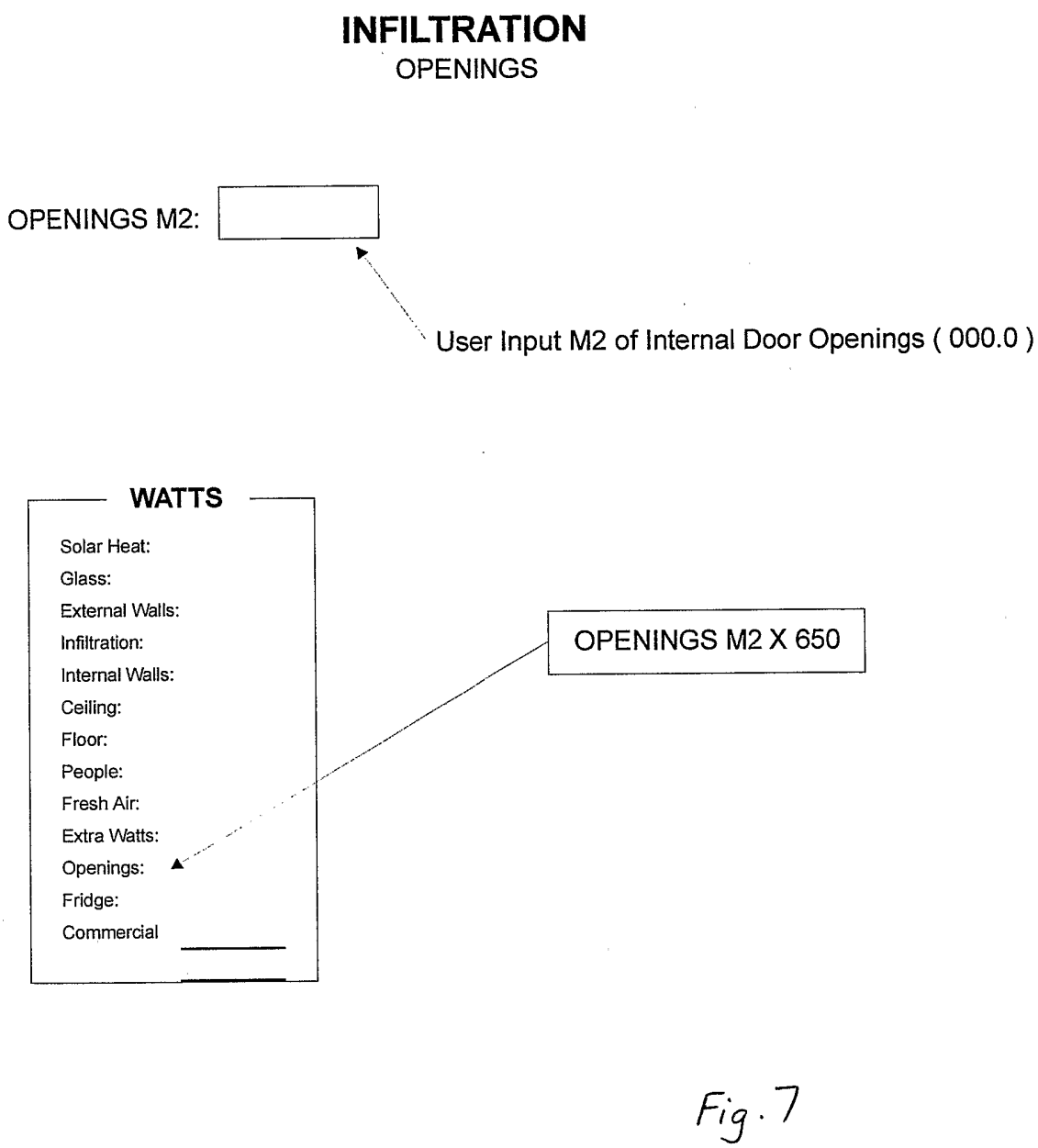

INFILTRATION
OPENINGS
OPENINGS M2:
User Input M2 of Internal Door Openings (000.0)
WATTS
Solar Heat:
Glass:
External Walls:
Infiltration:
Internal Walls:
Ceiling:
Floor:
People:
Fresh Air:
Extra Watts:
Openings:
Fridge:
Commercial
OPENINGS M2 X 650

Fig. 7

FRIDGE

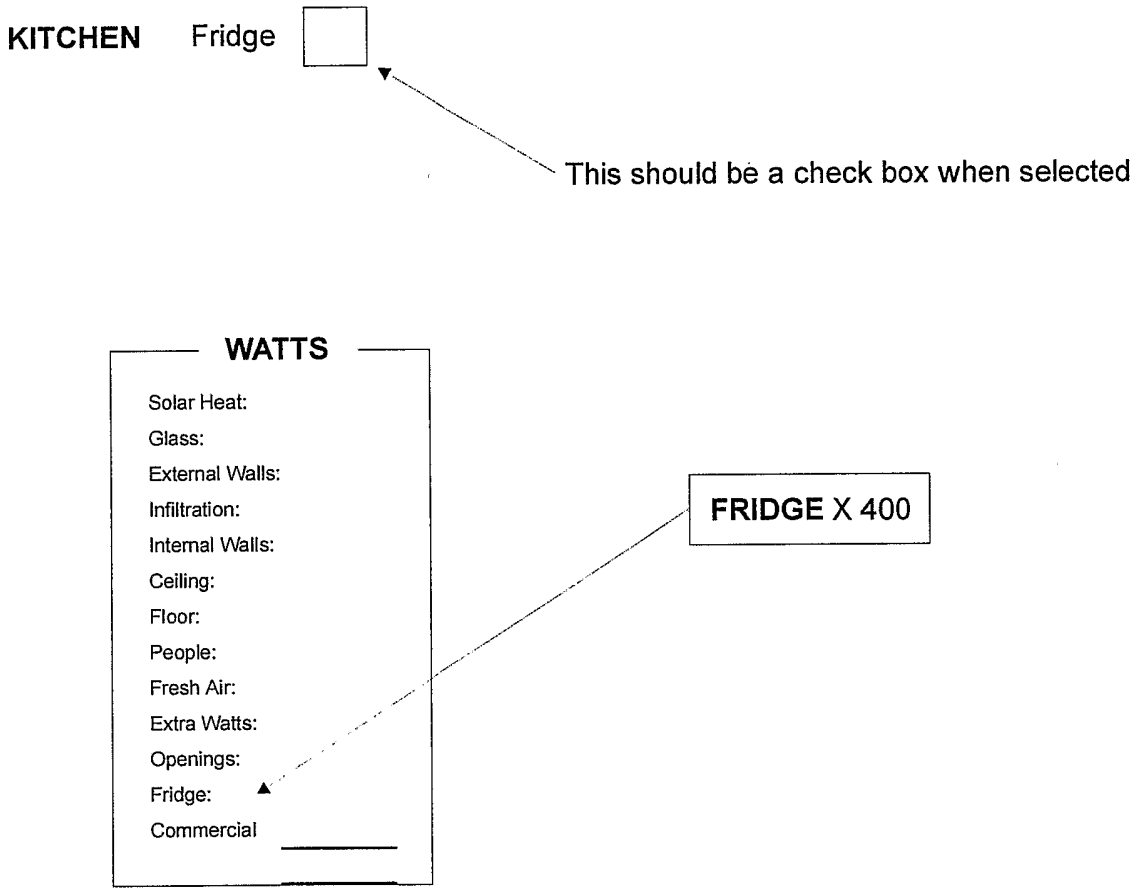

KITCHEN
Fridge
This should be a check box when selected
WATTS
Solar Heat:
Glass:
External Walls:
Infiltration:
Internal Walls:
Ceiling:
Floor:
People:
Fresh Air:
Extra Watts:
Openings:
Fridge:
Commercial
FRIDGE X 400

Fig. 8

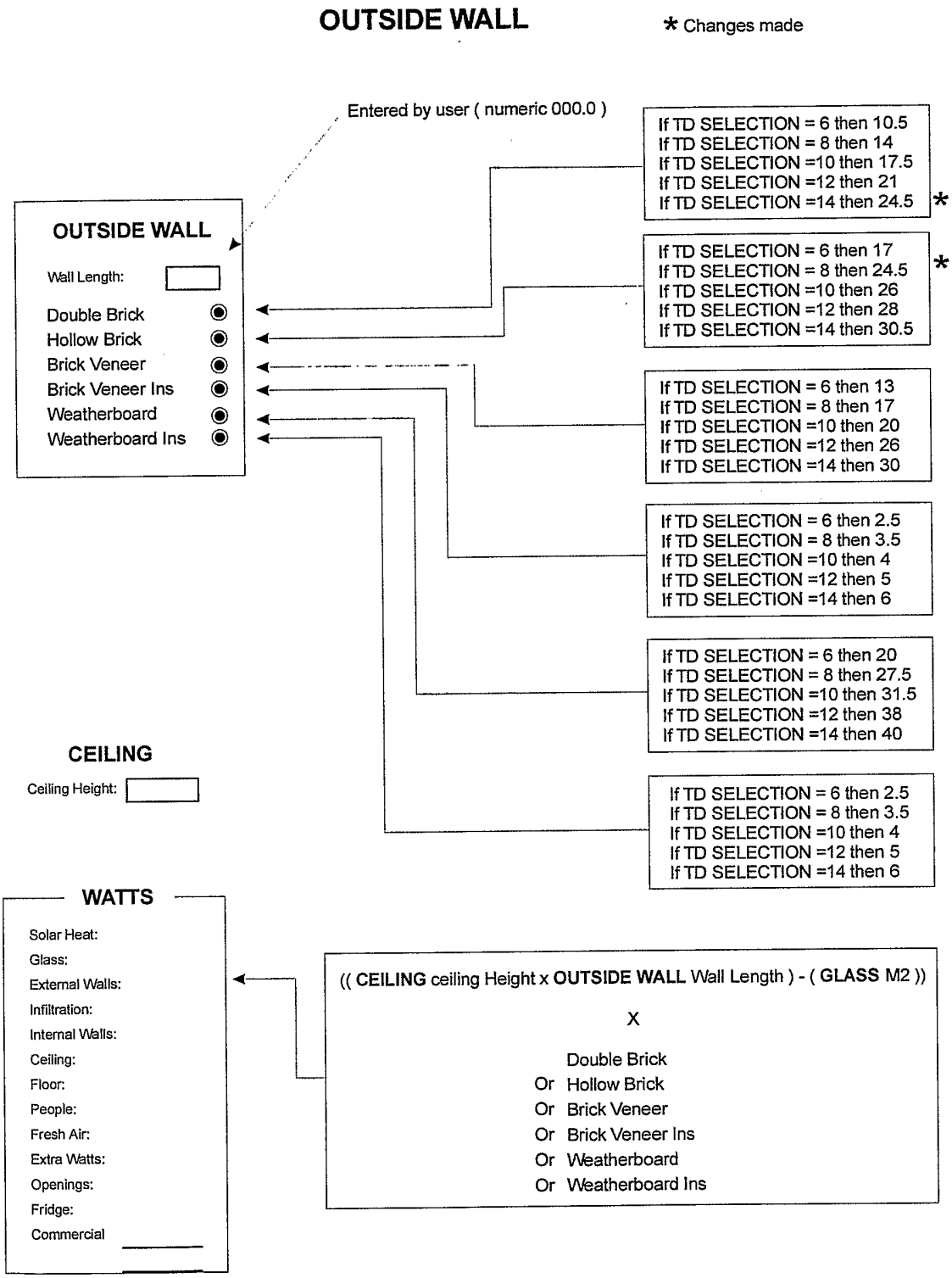

OUTSIDE WALL
* Changes made
Entered by user (numeric 000.0)
OUTSIDE WALL
Wall Length:
Double Brick
Hollow Brick
Brick Veneer
Brick Veneer Ins
Weatherboard
Weatherboard Ins
If TD SELECTION = 6 then 10.5
If TD SELECTION = 8 then 14
If TD SELECTION =10 then 17.5
If TD SELECTION =12 then 21
If TD SELECTION =14 then 24.5 *
If TD SELECTION = 6 then 17
If TD SELECTION = 8 then 24.5
If TD SELECTION =10 then 26
If TD SELECTION =12 then 28
If TD SELECTION =14 then 30.5 *
If TD SELECTION = 6 then 13
If TD SELECTION = 8 then 17
If TD SELECTION =10 then 20
If TD SELECTION =12 then 26
If TD SELECTION =14 then 30
If TD SELECTION = 6 then 2.5
If TD SELECTION = 8 then 3.5
If TD SELECTION =10 then 4
If TD SELECTION =12 then 5
If TD SELECTION =14 then 6
If TD SELECTION = 6 then 20
If TD SELECTION = 8 then 27.5
If TD SELECTION =10 then 31.5
If TD SELECTION =12 then 38
If TD SELECTION =14 then 40
CEILING
Ceiling Height:
If TD SELECTION = 6 then 2.5
If TD SELECTION = 8 then 3.5
If TD SELECTION =10 then 4
If TD SELECTION =12 then 5
If TD SELECTION =14 then 6
WATTS
Solar Heat:
Glass:
External Walls:
Infiltration:
Internal Walls:
Ceiling:
Floor:
People:
Fresh Air:
Extra Watts:
Openings:
Fridge:
Commercial
((CEILING ceiling Height x OUTSIDE WALL Wall Length) - (GLASS M2))
X
Double Brick
Or Hollow Brick
Or Brick Veneer
Or Brick Veneer Ins
Or Weatherboard
Or Weatherboard Ins

Fig. 9(a)

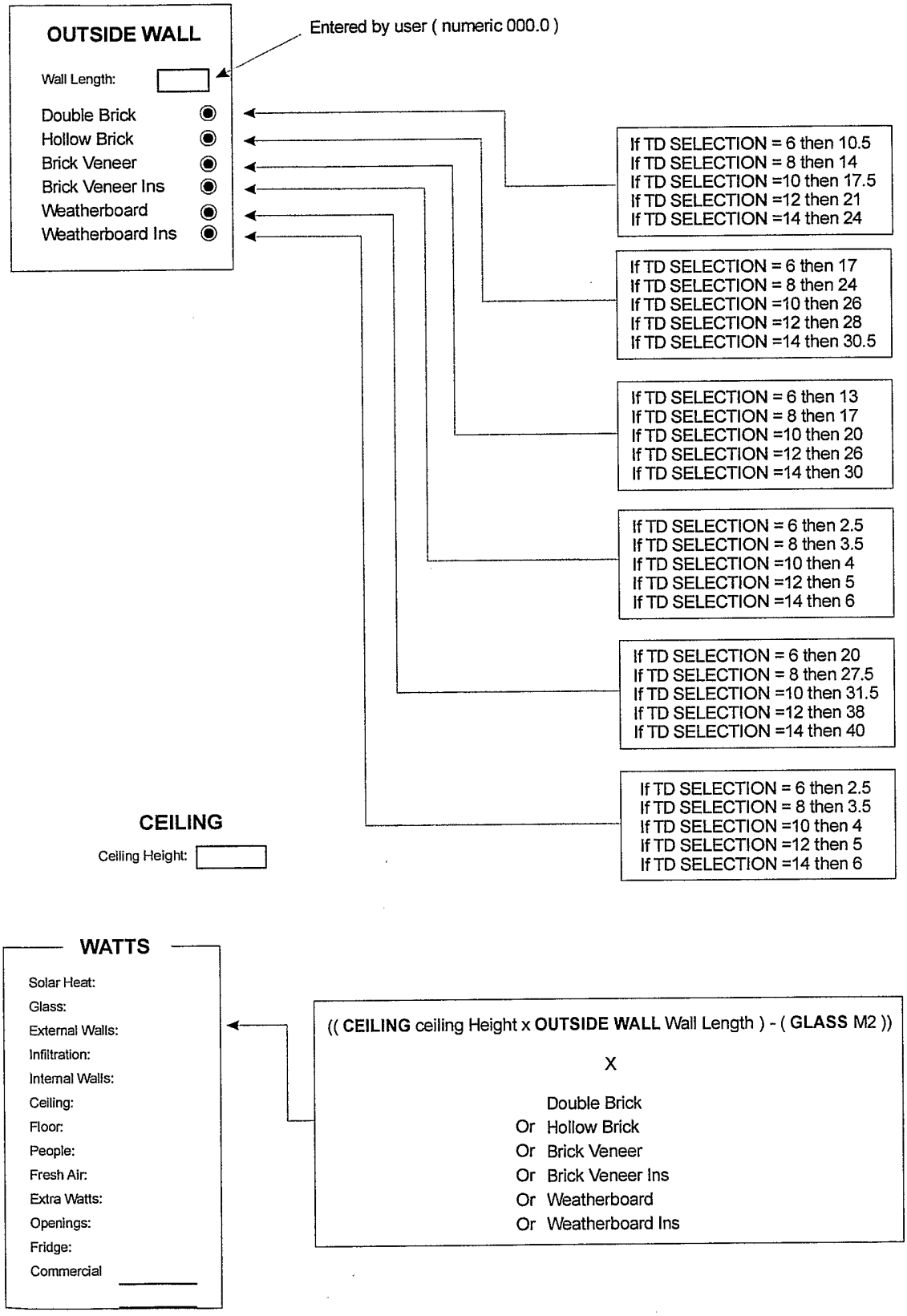
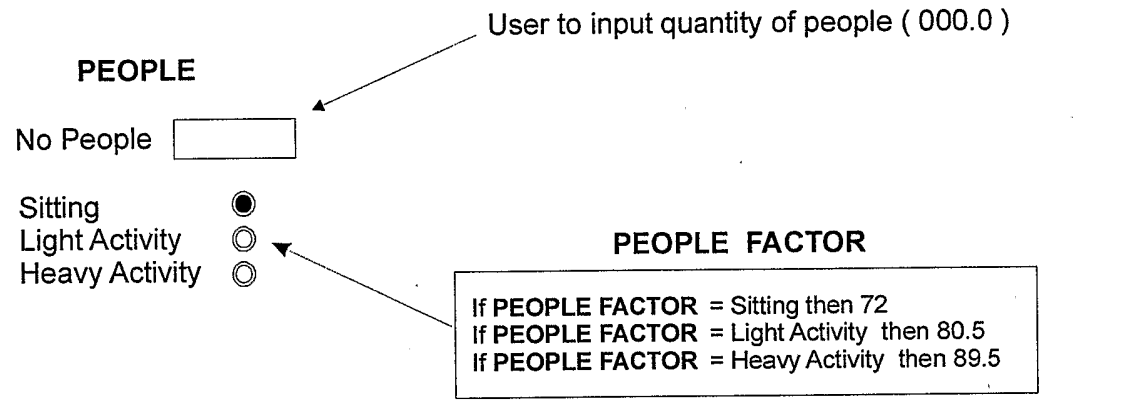

OUTSIDE WALL
Wall Length:
Entered by user (numeric 000.0)
Double Brick
Hollow Brick
Brick Veneer
Brick Veneer Ins
Weatherboard
Weatherboard Ins
If TD SELECTION = 6 then 10.5
If TD SELECTION = 8 then 14
If TD SELECTION =10 then 17.5
If TD SELECTION =12 then 21
If TD SELECTION =14 then 24
If TD SELECTION = 6 then 17
If TD SELECTION = 8 then 24
If TD SELECTION =10 then 26
If TD SELECTION =12 then 28
If TD SELECTION =14 then 30.5
If TD SELECTION = 6 then 13
If TD SELECTION = 8 then 17
If TD SELECTION =10 then 20
If TD SELECTION =12 then 26
If TD SELECTION =14 then 30
If TD SELECTION = 6 then 2.5
If TD SELECTION = 8 then 3.5
If TD SELECTION =10 then 4
If TD SELECTION =12 then 5
If TD SELECTION =14 then 6
If TD SELECTION = 6 then 20
If TD SELECTION = 8 then 27.5
If TD SELECTION =10 then 31.5
If TD SELECTION =12 then 38
If TD SELECTION =14 then 40
If TD SELECTION = 6 then 2.5
If TD SELECTION = 8 then 3.5
If TD SELECTION =10 then 4
If TD SELECTION =12 then 5
If TD SELECTION =14 then 6
CEILING
Ceiling Height:
WATTS
Solar Heat:
Glass:
External Walls:
Infiltration:
Internal Walls:
Ceiling:
Floor:
People:
Fresh Air:
Extra Watts:
Openings:
Fridge:
Commercial
((CEILING ceiling Height x OUTSIDE WALL Wall Length) - (GLASS M2))
X
Double Brick
Or Hollow Brick
Or Brick Veneer
Or Brick Veneer Ins
Or Weatherboard
Or Weatherboard Ins

Fig. 9(b)

PEOPLE



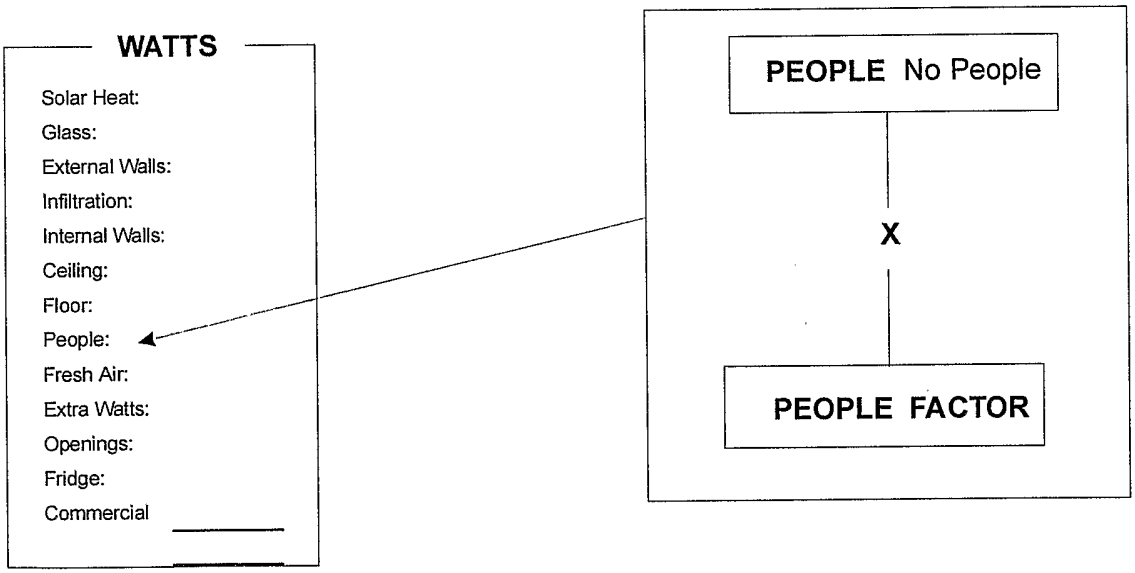


Fig. 10

CALCULATION FOR INFILTRATION

Note:

Infiltration is calculated in the background and will not be seen by the operator. However the opening section of infiltration will need to be inputted and seen.

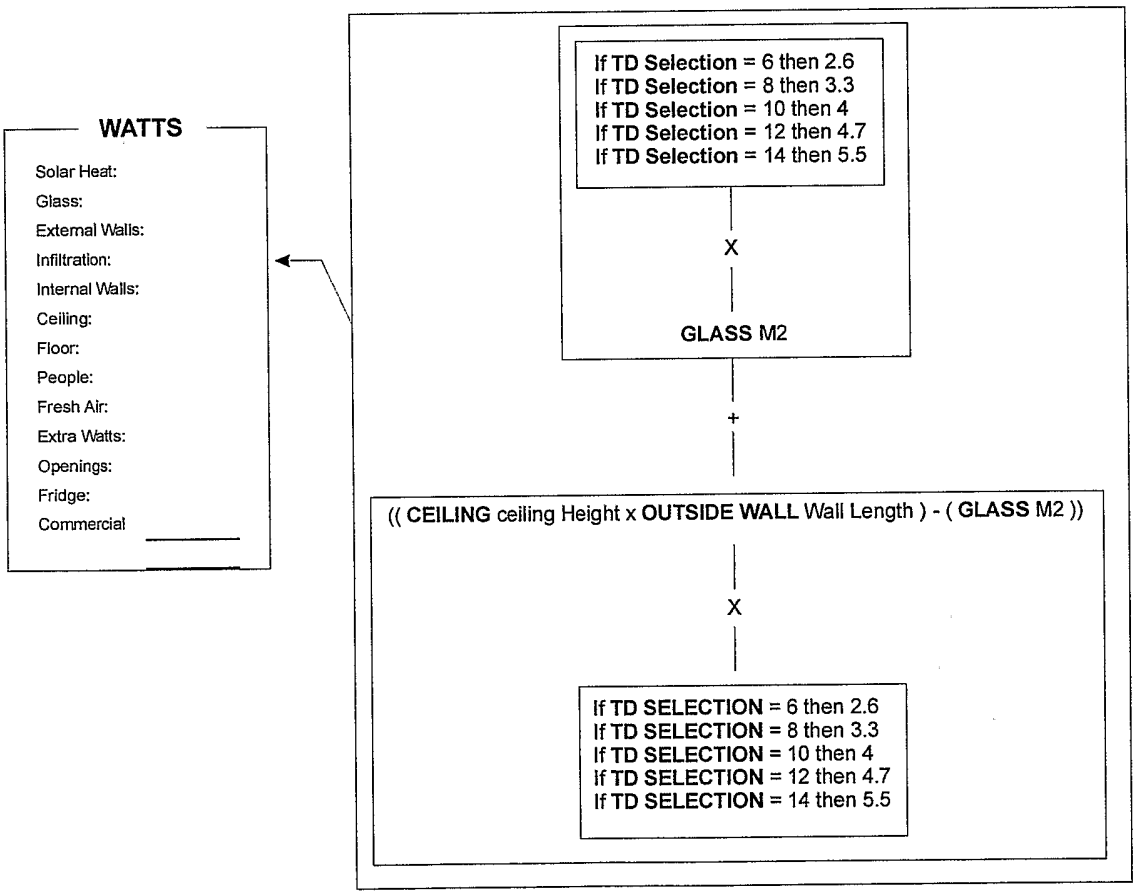


Fig. 11

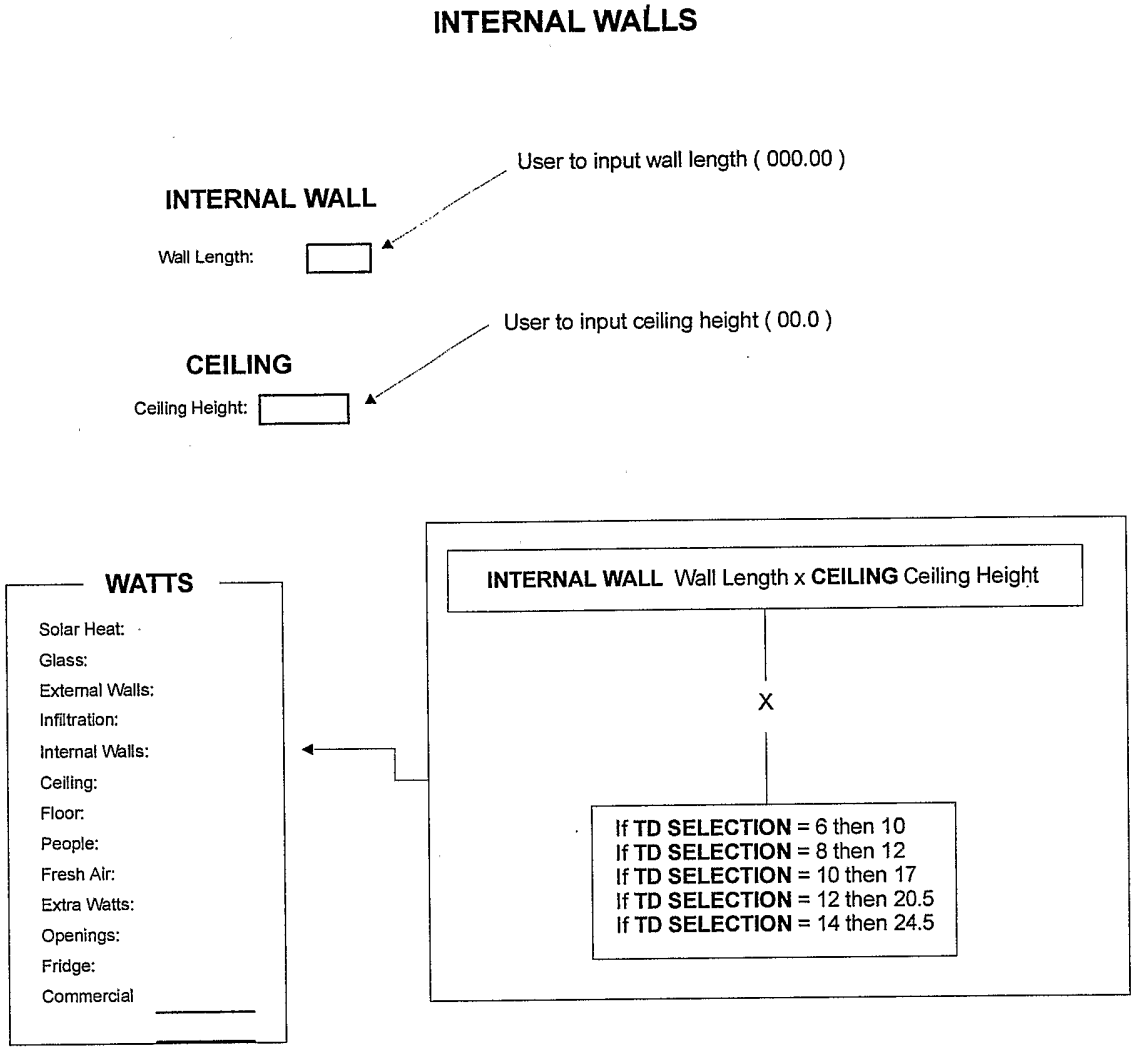
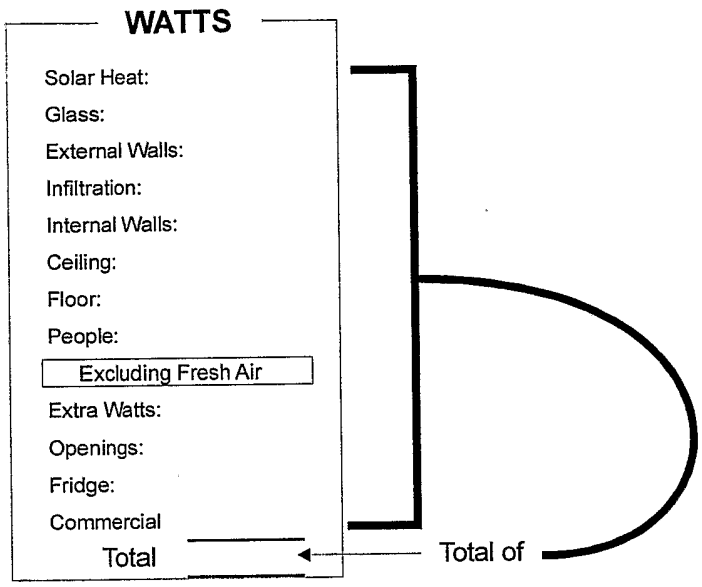

INTERNAL WALLS
User to input wall length (000.00)
INTERNAL WALL
Wall Length:
User to input ceiling height (00.0)
CEILING
Ceiling Height:
WATTS
Solar Heat:
Glass:
External Walls:
Infiltration:
Internal Walls:
Ceiling:
Floor:
People:
Fresh Air:
Extra Watts:
Openings:
Fridge:
Commercial
INTERNAL WALL Wall Length x CEILING Ceiling Height
X
If TD SELECTION = 6 then 10
If TD SELECTION = 8 then 12
If TD SELECTION = 10 then 17
If TD SELECTION = 12 then 20.5
If TD SELECTION = 14 then 24.5

Fig. 12

TOTAL COOLING KW AMOUNT for DUCTED

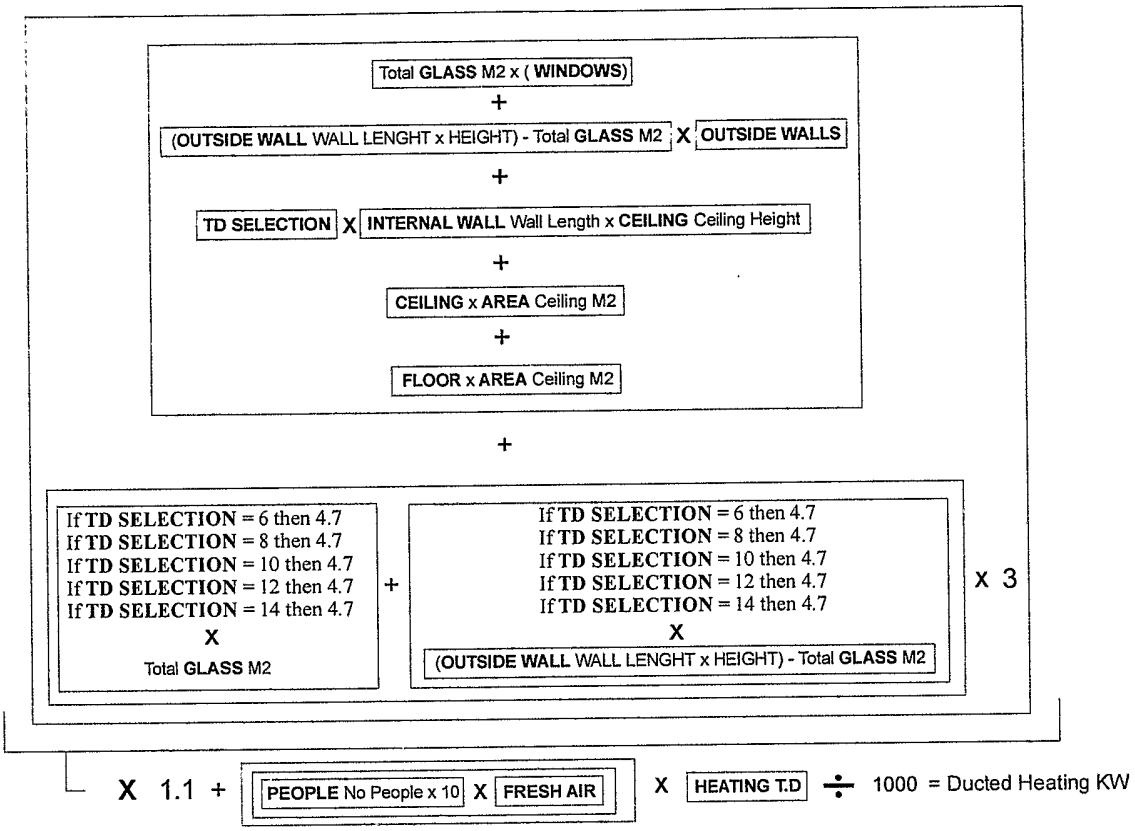


DUCTED COOLING KW

Total Sensible X 1.1 + FRESH AIR WATTS ÷ 1000 x 1.2 = Ducted kW

Fig. 13 (a)

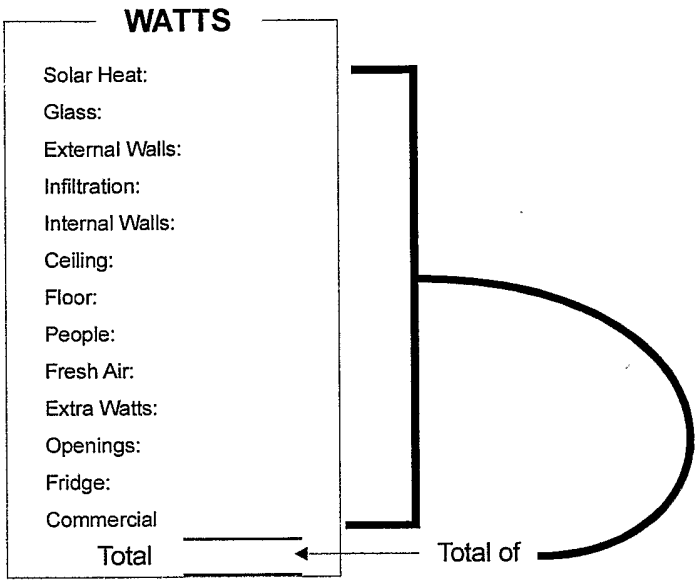
DUCTING HEATING



Note: If TD SELECTION = 16 or 18 then the factor should be 4.7

Fig. 13(b)

TOTAL COOLING KW AMOUNT for SPLIT

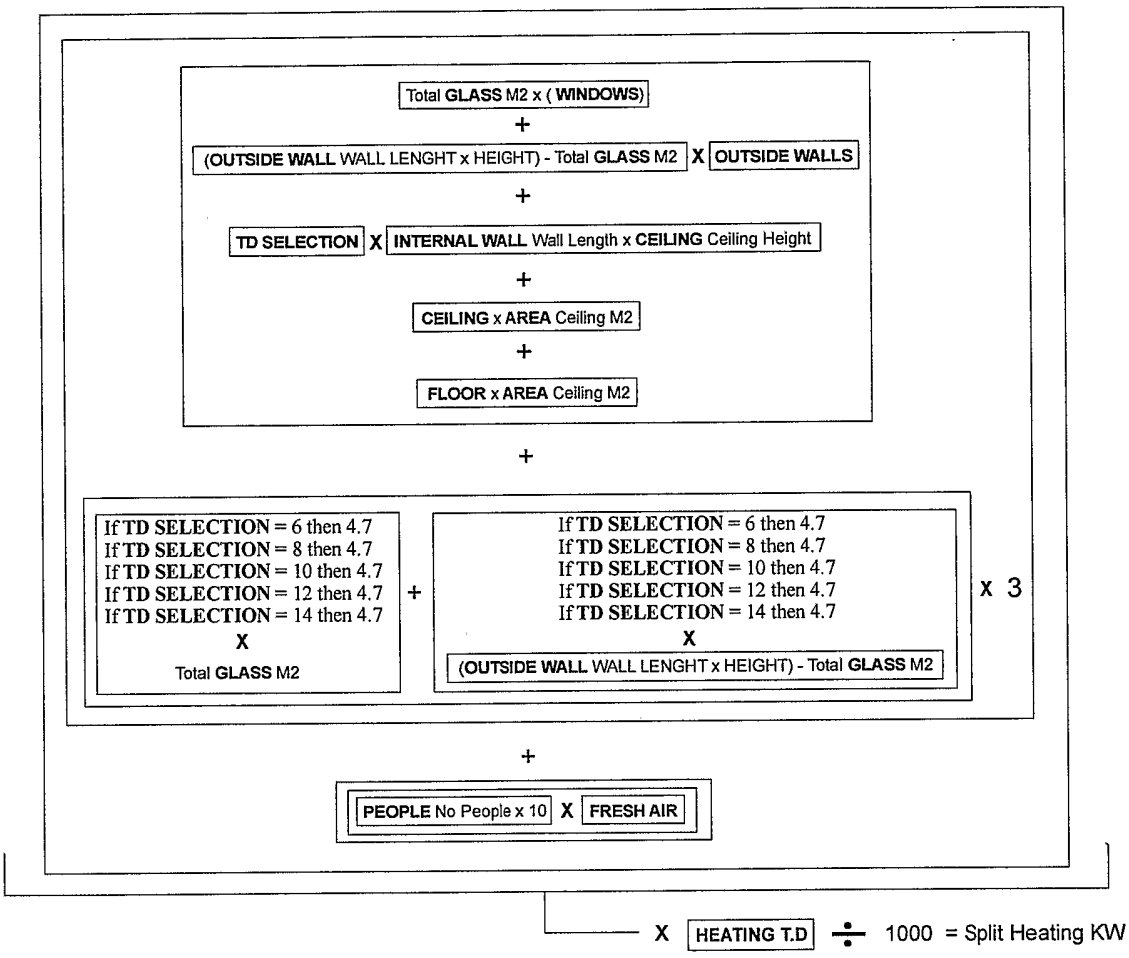


SPLIT COOLING KW

Total Sensible ÷ 1000 x 1.35 = Split kW

Fig. 14(a)

SPLIT HEATING



Note: If TD SELECTION = 16 or 18 then the factor should be 4.7

Fig. 14(b)

FRESH AIR FACTOR FOR COOLING

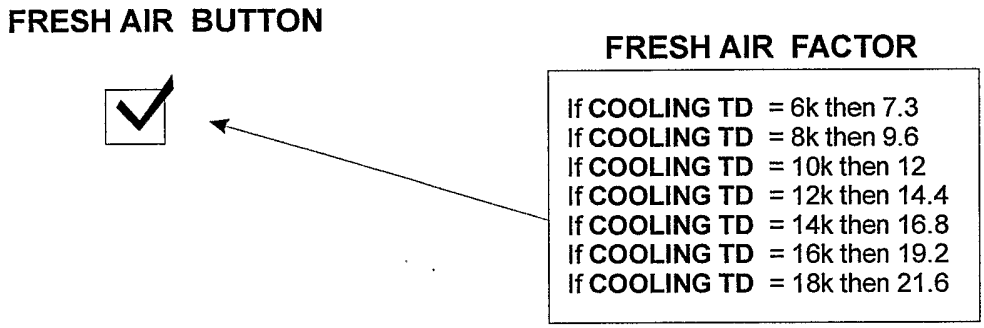


Fig. 15

FRESH AIR FACTOR FOR HEATING

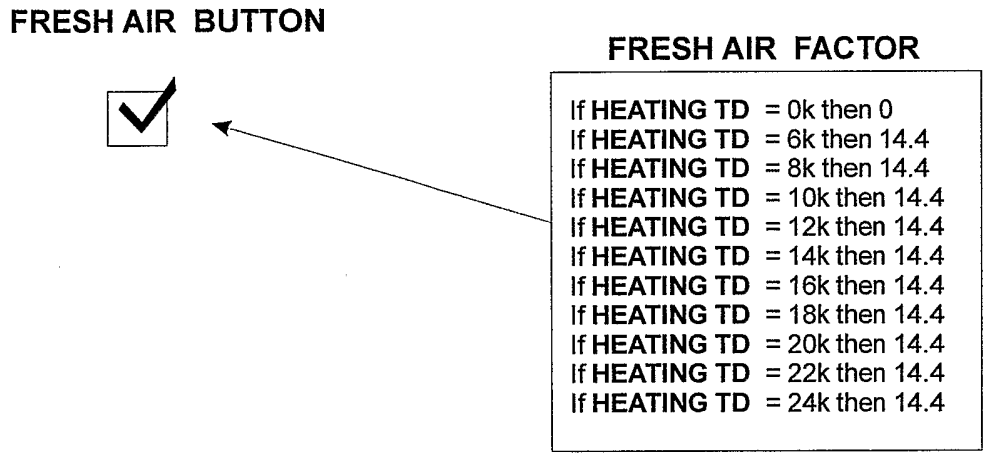


Fig. 16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU02/01078

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: G06F 17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPAT, USPTO IPC G06F 17/60, Key words quote/quotation, database, installation, air conditioning

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9852144A, METROLOGIC INSTRUMENTS INC., 19 November 1998	
P,A	Derwent abstract accession no 2002-249506/30, Class T01, JP 2002056054A, 20 February 2002	
P,A	Derwent abstract accession no. 2002-347667/38, Class T01, JP 2002083175A, 22 March 2002	

☐ Further documents are listed in the continuation of Box C ☒ See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 September 2002	19 SEP 2002
Name and mailing address of the ISA/AU	Authorized officer
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	**S KAUL** Telephone No : (02) 6283 2182

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU02/01078

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
WO	9852144	AU	75700/98	EP	983570	GB	2341251
		US	6085978	US	2002000467	US	6158659
		US	6182897	US	2001015380	US	2002000466
		US	2002000469	US	6354505	US	6360947
		US	2002043561	US	2002047048	US	6382515
		US	6422467	US	2002114076		

END OF ANNEX