Getting Started Tutorial

see *electrical*™

V8R2

Tutorial

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A   FOREWORD

This document is intended for anybody who is new to *SEE Electrical Free*. This will encompass users who already have experience in using electrical drawing packages, and also those who are totally new to the area. In addition, it is understood that readers will also have very different levels of IT literacy. Because of this, the instructions have been made as complete as possible. If you feel some of the steps are 'a bit basic', then please feel free to skip through them in quick time.

The tutorial is best carried out with the use of a mouse, as a laptop touchpad lacks the precision required for quickly and accurately placing components. Steps involving 'clicking' or 'selecting' should be taken to imply that the left mouse button is to be used. The right mouse button is used less, and you will be specifically instructed when to do so.

It is strongly recommended that you fully read each step before carrying out its instructions. You are also encouraged to always compare what you have drawn to the relevant figures, as these are the best indication that what you have done is correct.

You will quickly become familiar with the various functions and how to implement them. Indeed, one of the major strengths of *SEE Electrical* over other *Electrical CAD (ECAD)* packages is its ease of use. Only a minimal training period is required before users can quickly create their own complex projects.

B   BEFORE YOU START

It is essential that you follow the instructions on this page before starting the tutorial; otherwise, you will not have the required symbol groups available to you in SEE Electrical.

It is assumed that you have downloaded the free version of *SEE Electrical* from our website. It is also assumed that you have installed the software on your computer. If this is not the case, then do this before continuing.

If you need help with any of the above, please contact our helpdesk.

B.1. ABBREVIATIONS USED IN THIS TUTORIAL

Inputs are described as follows:

CA	Select a category
CO	Select a command
+	Select an element with the cursor
M	Select from a pull-down menu
#	Keyboard entry
>	Select a field in a window
<Input>	Type text or select an element etc.
T	Click onto a tab in a window
I	Select a toolbar icon

B.2. FOLDERS AND FILES

SEE Electrical uses the following folders and files:

< SEE Electrical V8R2 folder>	The program files of *SEE Electrical* are saved in this folder.
Users\Public\Public Documents\IGE-XAO\SEE Electrical Free\ V8R2\ Projects	In this folder, you can find the workspace files of *SEE Electrical* delivered by default. Workspace files have the .SEP extension.
Users\Public\Public Documents\IGE-XAO\SEE Electrical Free\ V8R2\Symbols	This folder contains the symbol databases in *SEE Electrical*. Symbol databases have the .SES extension. The TYPES.SES database, required in the *Standard* and *Advanced* levels is also stored here. (not available in *SEE Electrical Free*) Note that the SYSTEM.SES library is required for internal purposes and must not be removed from this folder.
Users\Public\Public Documents\IGE-XAO\SEE Electrical Free\ V8R2\Templates	This folder contains workspace and page templates and templates for lists and labels. Fonts are saved here, too. SEP: Workspace templates TDW: Page templates DAT: Fonts
Users\Public\Public Documents\IGE-XAO\SEE Electrical Free\ V8R2\Templates\Label_Settings	SLS files (used for creating labels for different printer formats).

C   CREATING A WORKSPACE

Important: Do not begin this stage before you have followed the instructions on the previous pages!

C.1.   CREATING A NEW WORKSPACE

This chapter shows you how to create a new workspace and then create a page in it.

Quick guide:

1.CA	**File**	
2.CO	**New…**	
	The ***New Workspace*** dialogue box is displayed.	

Note:

Various contents may appear within the dialogue.

3.>	File name	
4.#	<Workspace name>	
	You can write a long descriptive name which can contain spaces.	
5.>	**Save**	
	The ***Select Workspace Template*** window, which contains a list of available workspace templates, is displayed:	
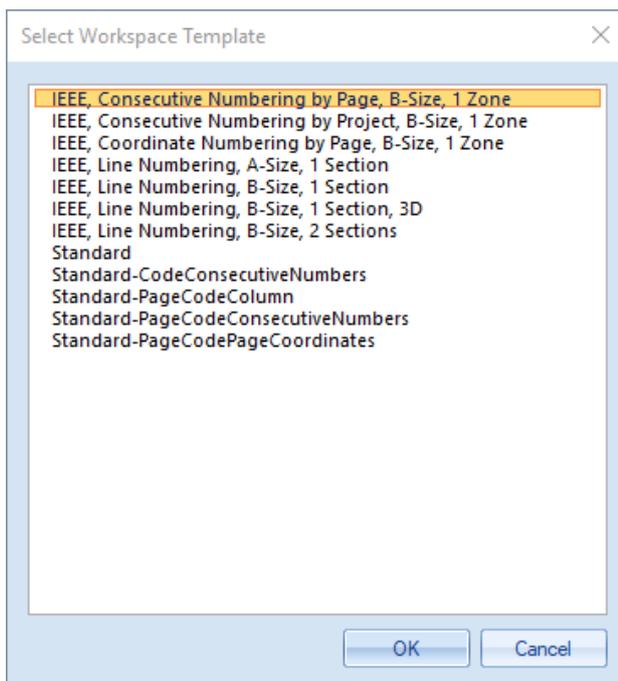
Note

Various contents may appear within the window.

6.>   IEEE, Consecutive Numbering by Page, B-Size, 1 Zone
7.>   **OK**
            The workspace information is displayed in the ***Properties*** pane in the left area of the
            main *SEE Electrical* window:

Properties		
Name	Value	
Attributes - Tutorial Project1		
File-name	C:\Users\Public\Document...	
Customer		
Address 1		
Address 2		
Zipcode		
City		
Telephone		
Fax		
E-mail		
Attention 1		
Attention 2		
Attention 3		
Document number		
Workspace Description-lin...		
Workspace Description-lin...		

File-name
Tutorial Project1

| Circuit Diagrams (IEEE) ▾ | New page |

In the first field you can see the name of the workspace (*.SEP).
In these fields you can type in text information applicable to the whole project. If text
placeholders are defined in the page templates of the circuit diagrams, the information is
transferred on all the pages of the workspace. Consequently, here you must enter or change all
the data that must appear on all pages.

Customer Information
You can type information concerning the customer in the fields ***"Customer"***, ***"Address 1"***, etc...

General Information about the workspace
In the fields ***"Workspace Description-line 01 … 10"***, you can type descriptions of the project.
These descriptions will automatically be inserted into all the pages of the workspace if the
respective placeholders are available in the page template.
In this workspace example and in the relevant page template, description lines 01 and 02 are
used to describe the workspace.

Type in the following text in the dialogue:

8.>		Workspace Description-line 01:
9.#		Workspace example
10.>		Workspace Description-line 02:
11.#		*SEE Electrical*

Fill information about the customer if desired.
The new workspace has been created. Now you will create the first page in it.

12. Right-click the 🔧 Circuit Diagrams (IEEE) module in the **Workspace Explorer** and select the **New Page** pop-up command.
The **Page information** dialogue box is displayed.
Type the following information in the dialogue box:

13.>		Page
14.#		1

The page number is automatically suggested by *SEE Electrical* but you can change it.

15.> Page Description-line 01
The data entered in the **Page information** dialogue box applies only to the current page of the circuit diagram. It will be displayed in the page if the corresponding text placeholders are available in the page template.

16.#		Power Supply
17.>		Page Description-line 02
18.#		Motor Control
19.>		Page Description-line 03:
20.#		Motor Reverse
21.>		Page Created Date
22.#		*SEE Electrical* automatically inserts the date but this can be changed if desired.

If you click the field 🖊 in the "**Page Created Date**" field, you can choose a date.

You can change the date by clicking the field 🖊 in the "**Page Created Date**" field. You can change the day, month, or year.
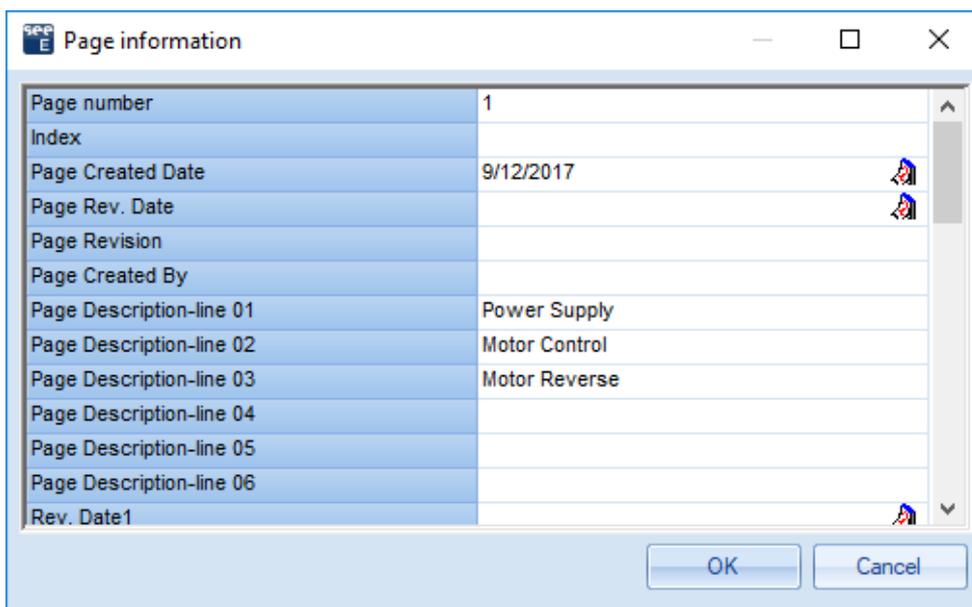
23.> **OK**
Page 1 is now displayed on the screen:
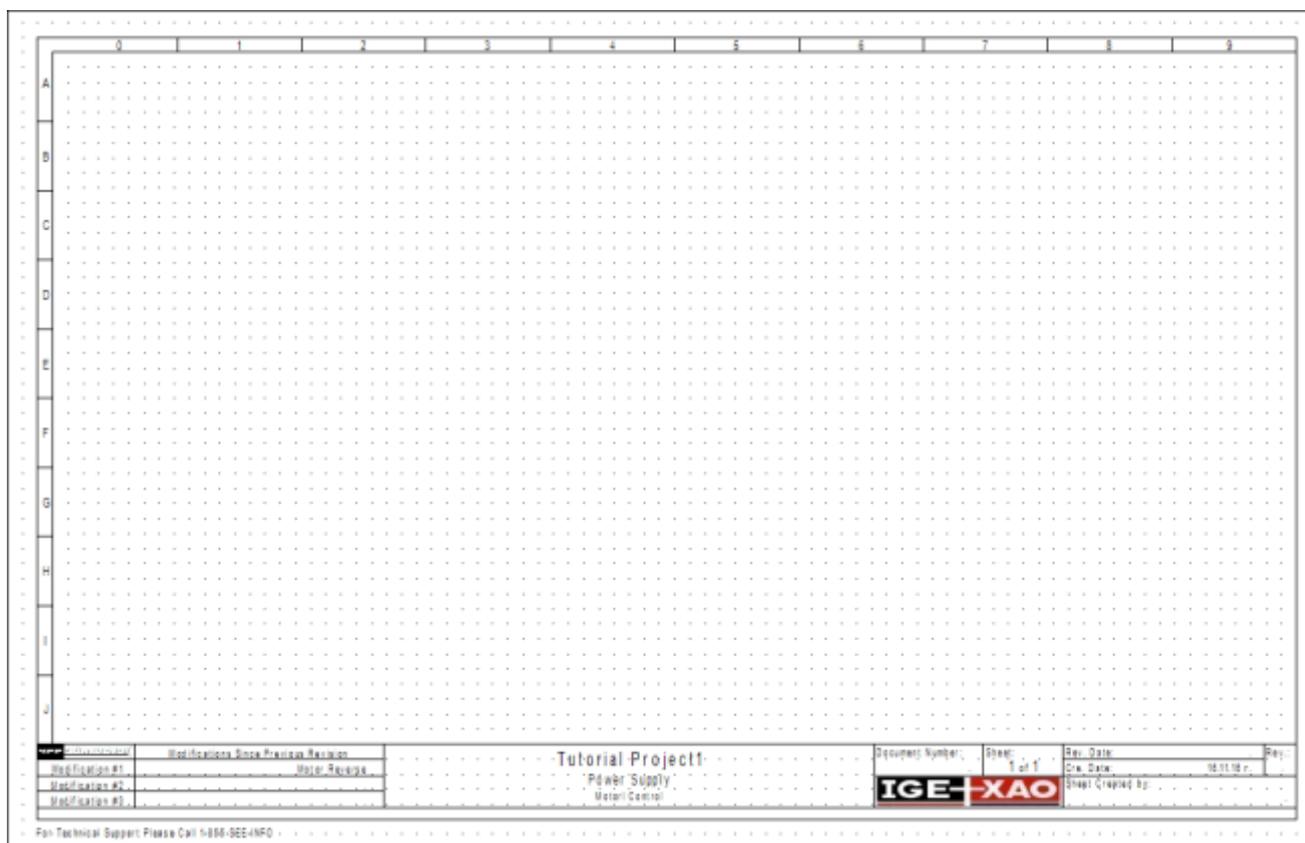
Hints for creating a new page

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*Diagrams in ISO A3 format are used for circuit diagrams by default. The page dimensions and the standard sheet are defined by the workspace template or page template that you choose. For example, in this workspace example, you have chosen the workspace template **IEEE, Consecutive Numbering by Page, B-Size, 1 Zone**. You can create your own templates and standard sheets.*

D   DRAWING CIRCUIT DIAGRAMS

D.1. DRAWING PAGE 1

This chapter shows you, step by step, how to draw the circuit diagram on page 1.

D.1.1. POTENTIALS ON PAGE 1

Follow the next steps to insert five potentials on page 1.

First, insert the three top potentials.

Quick guide:

1.CA	**Electrical IEEE**	
2.CO	**Left** (**Potential** panel)	
	Click the command. The potential is drawn and the **Component Properties** dialogue box is displayed. Type the name of the potential.	
3.#	Type L1 in the "**Product (-)**" field	
4.>	**OK**	
5.CA	**Electrical IEEE**	
6.CO	**Left**	
7.#	Type L2 in the "**Product (-)**" field	
8.>	**OK**	
9.CA	**Electrical IEEE**	
10.CO	**Left**	
11.#	Type L3 in the "**Product (-)**" field	
12.>	**OK**	

Hint

You can activate the **Potential – Left** *functionality by pressing F11 instead of clicking the ↨ icon.*

In the next steps, insert the two bottom potentials.

Quick guide:

1.CA	**Electrical IEEE**	
2.CO	**Right** (**Potential** panel)	
3.#	Type PE in the "**Product (-)**" field	
4.>	**OK**	
5.CA	**Electrical IEEE**	
6.CO	**Right** (**Potential** panel)	
7.#	Type N in the "**Product (-)**" field	
8.>	**OK**	

Hint

You can activate the **Potential – Right** *functionality by pressing F12 instead of clicking the* ⬍ *icon.*
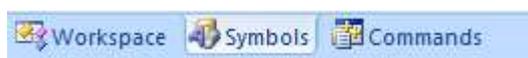

Hint

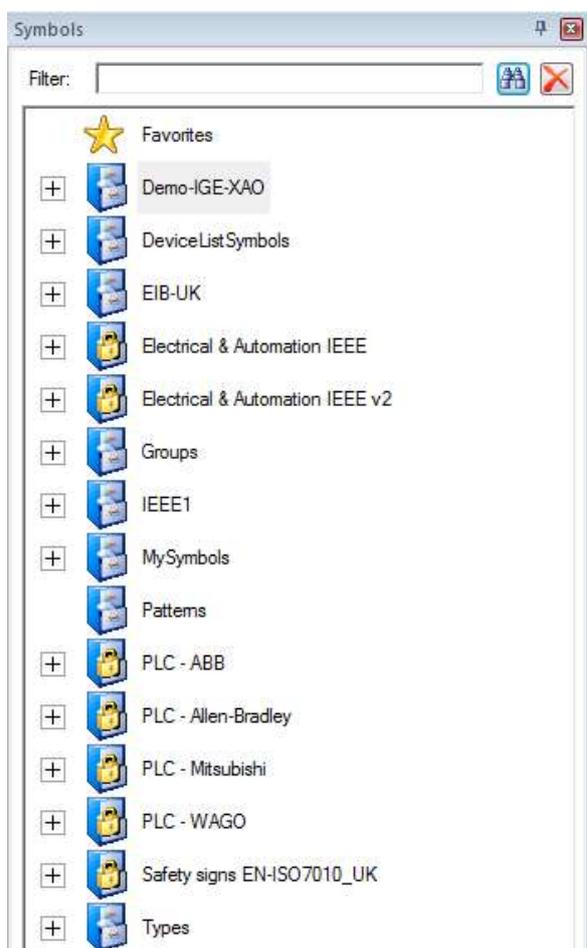*All wires must be continuous lines. This also applies to PE and N.*

D.1.2. ELECTRICAL SYMBOLS ON PAGE 1

You will now insert electrical symbols in the circuit diagram.

In the left area of the workspace, click the *Symbols* tab, as shown below:

Workspace   Symbols   Commands

The symbol tree is displayed:

Note:

Various contents may appear within the panel depending on the installed symbol libraries.

Selecting a symbol database

*SEE Electrical* symbols are distributed into symbol databases.
There exists a database of graphical symbols for diagrams according to IEEE Std 91/91a and IEEE Std 315. Other symbol databases include symbols for the layout of switchboards from *Danfoss*, *Siemens*, etc.

- Select the database that contains the symbols you wish to work with. (In this case, select **Electrical & Automation IEEE v2**.)
- Double-click the **Electrical & Automation IEEE v2** symbol database or click on the plus sign on the left of the symbol database name to expand it.

If the symbol database is not visible, browse through the symbol tree.
Each symbol database is divided into different folders such as *relay coils, converters and motors*. The different symbol folders are displayed.
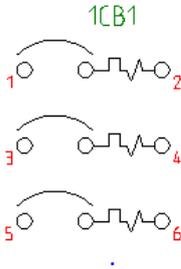The symbol folders are arranged in alphabetical order:
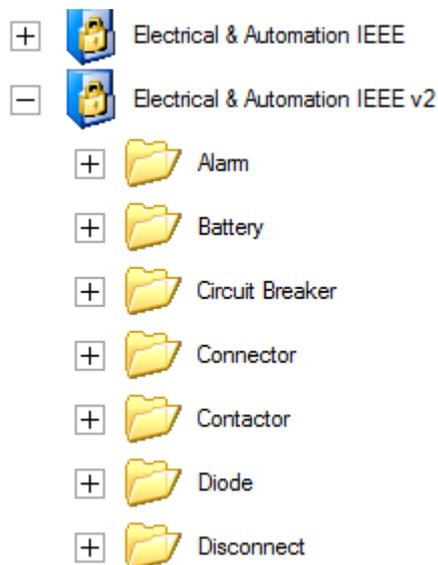
- Select the folder for the specific symbol you wish to work with.
- Select the symbol and insert it in the circuit diagram.

D.1.3. INSERTING A PROTECTIVE DEVICE ON PAGE 1

You will now insert a **protective device** in column 1.

```
1CB1
```

Quick guide:

1.   Double-click the **Circuit Breaker** symbol folder to open it.
2.+   Click the **TCB3P** symbol.
           Once you have selected the symbol, it appears attached to the cursor.
3.+   Move the cursor into the drawing area (Cell E1) where you want to insert the symbol.
4.+   Click with the mouse to insert the symbol.
5.   The symbol name is automatically assigned (1CB1).
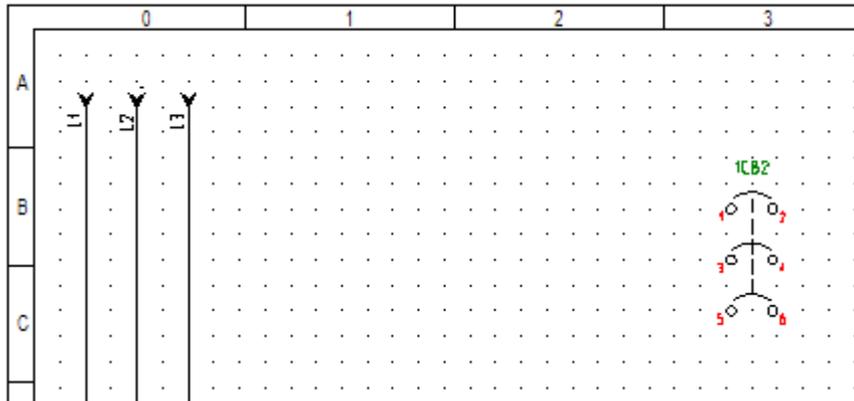6.   Right-click to exit the insertion mode.

Hint

If you cannot find the symbol in your symbol database, use the "Filter" field in the upper part of the panel. Type "TCB3P" in it and press Enter.

D.1.4. INSERTING A CIRCUIT BREAKER ON PAGE 1

You will now insert a **circuit breaker** in column 2.
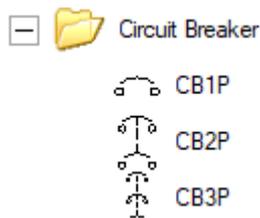
Quick guide:

1.   Double-click the **Circuit Breaker** symbol folder to open it.
2.   Click the **CB3P** symbol.
3.+   Move the cursor into the drawing area where you want to insert the symbol (the symbol is attached to the cursor).
4.+   Click to insert the symbol between cells B3 and C3.

5.   Right-click to exit the insertion mode.

Hint

You can close a symbol folder by clicking on the minus sign on the left of the symbol folder:

D.1.5. INSERTING A MOTOR ON PAGE 1

You will now insert a motor in column 9, behind the right potentials.
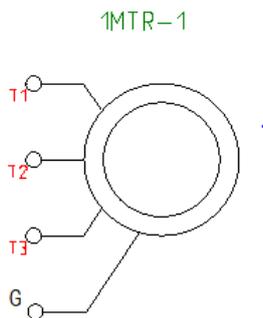
Quick guide:

1.   Open the **Motors** symbol folder.
2.   Select the **Motor_Gnd** symbol (this is a 3 phase motor with additional ground contact).
3.+   Move the cursor into the drawing area on the right of the potentials N and PE.

4.+ Click to insert the symbol. Position the motor accurately, so its contacts are aligned with the contacts of the 1CB1 protective device.
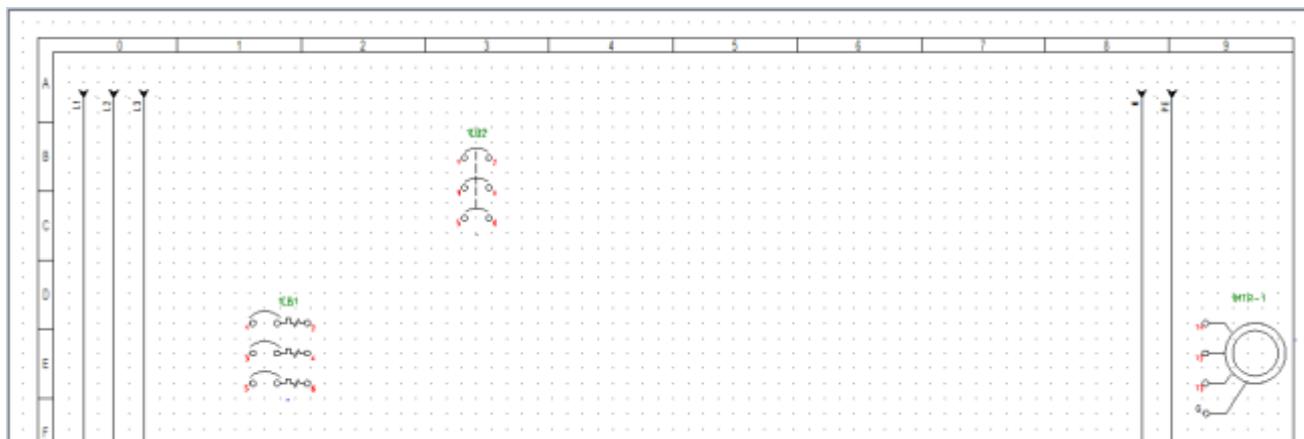
5. Right-click to exit the insertion mode.

D.1.6. INSERTING TYPE AND DESCRIPTION
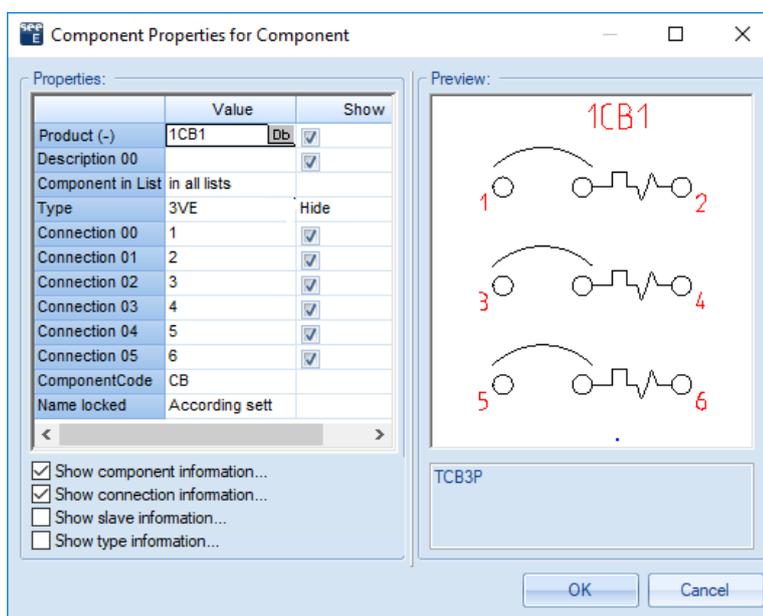
You will now insert data about the type and possibly, the function of the three symbols.

Quick guide:

1.+ Double-click the **1CB1** protective device symbol.
The symbol is highlighted in red.
The *Component Properties* dialogue box is displayed.

2.> Product (-)
The component name is displayed, and you can change it as desired.

3.> Type

4.# 3VE
This is an example of a type.

5.>   Connection 00, etc.
The connection texts of the component are displayed in these fields. You can change them if required.

6.>   **OK**
Click **OK** to close the **Component Properties** dialogue.

Change also the types of the motor and the main circuit breaker.

The main circuit breaker must receive the type "S3", and the motor - the type "M10". You must also change the connection names of the motor in its **Component Properties** dialogue:
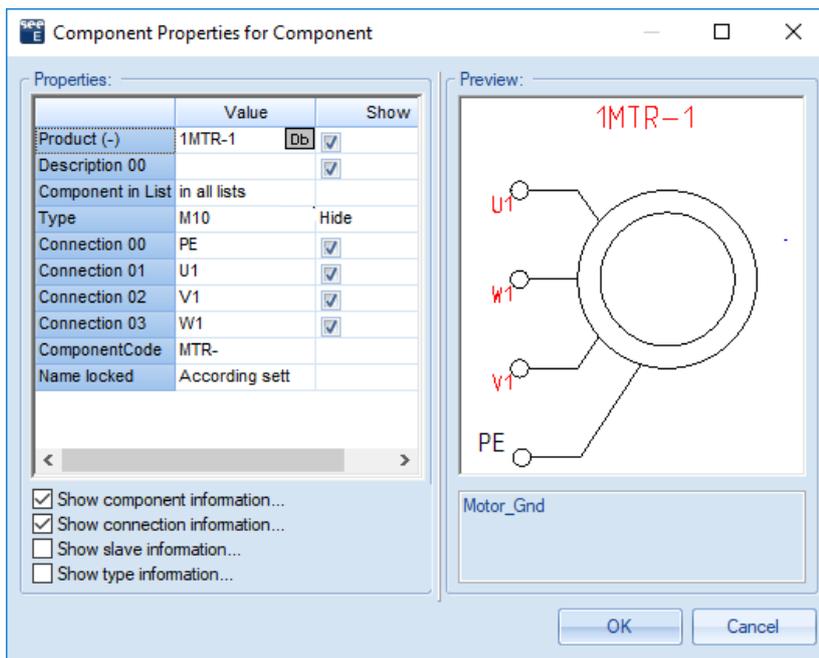
D.1.7. INSERTING MAIN CONTACTS ON PAGE 1

You will now insert **main contacts** in columns 3 and 4.

Quick guide:

1.   Double-click the **Contactor** symbol folder to open it.
2.   Select the **CON3P Slave** contactor symbol.
3.+   Move the cursor into the drawing area.
4.+   Insert the symbol right below the main circuit breaker aligned with the 1CB1 protective device.
The **Component Properties** dialogue box is displayed.
Change the name of the contact.
5.>   Product (-)
6.#   **K1**
7.#   Fill in the empty fields as shown in the picture:
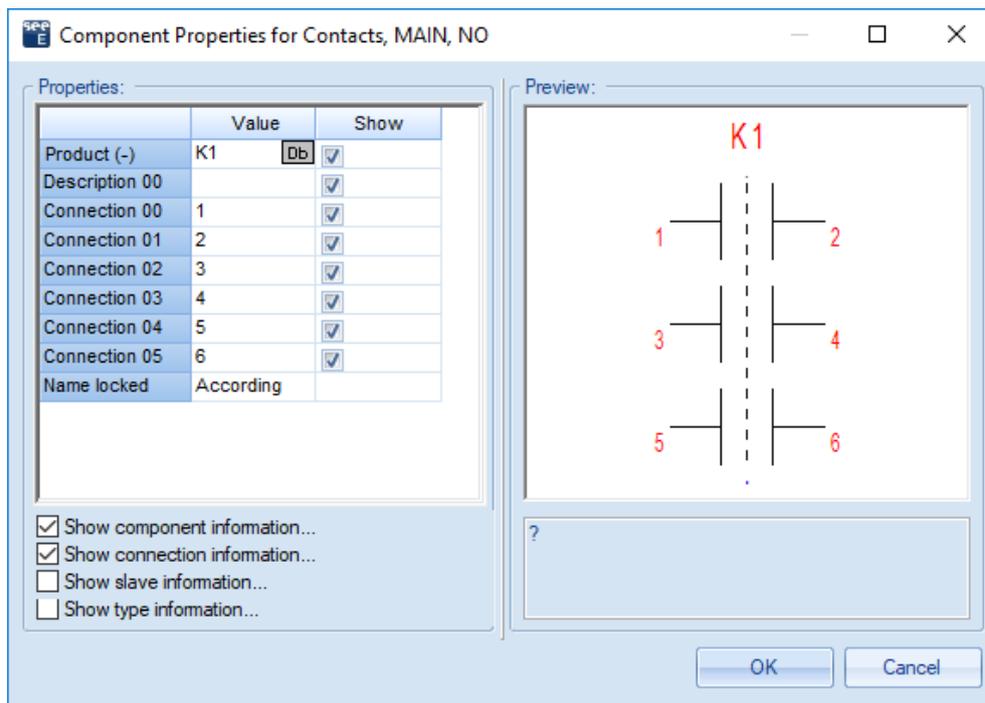
8.>   **OK**
           Insert the second main contact.

9.+   Click to insert the contact symbol below the first contact.
           The **Component Properties** dialogue box is displayed again.

10.>   Product (-)

11.#   **K2**

12.#   Enter the connection numbers again.

13.>   **OK**
           Right-click to exit the insertion mode.
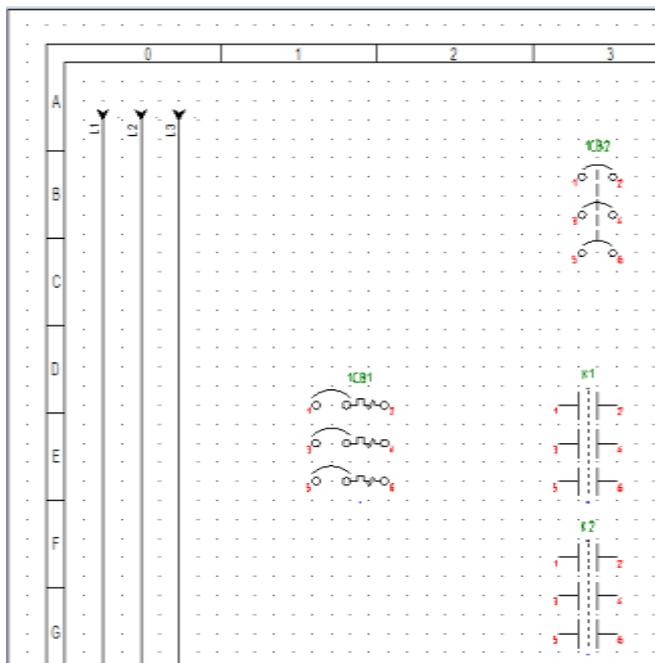
D.1.8. INSERTING A TERMINAL STRIP WITH 5 TERMINALS ON PAGE 1

You will now insert five terminals in column 8 on the right of the existing potentials.

Note:

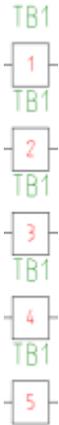*To insert the terminals, you will need more space. Move the two right potentials by selecting both of them and dragging them three-four steps to the left*

Quick guide:

1.   Open the **Terminals** symbol folder.
2.   Select the **TER S1 2C** symbol.
3.+   Move the cursor into the drawing area where you want to insert the symbol. The symbol is attached to the cursor.
4.+   Click to insert the symbol (in Cell B8). The terminal must be aligned with the circuit breaker's first contact.
        The **Component Properties** dialogue box is displayed (first terminal), change as described:
5.>   Product (-)
6.#   TB1
7.>   Terminal Number
8.#   **1** (first terminal number available in the terminal strip)
9.>   **OK**
10.   Continue inserting terminals. Insert four more terminals aligned with the circuit breaker's contacts.

Hint

*Hold down the **CTRL** key to copy the first terminal to the next connections. This way you copy the **"Product (-)"** name of the terminal, so you do not have to enter it every time.*

The numbers 2, 3, 4 and 5 are assigned automatically to the next four terminals (if you choose not to copy the first terminal, type "TB1" in the **"Product (-)"** fields of the respective **Component Properties** dialogues).
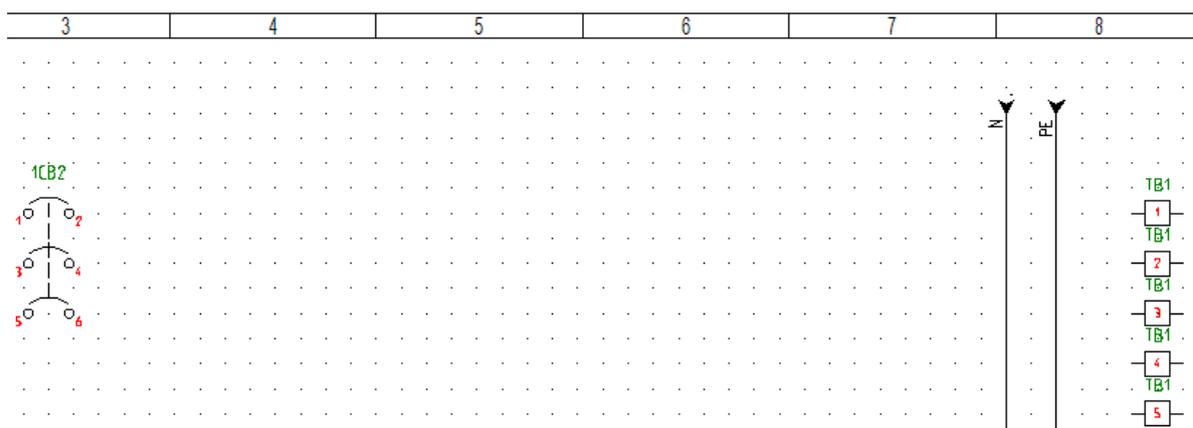
D.1.9. INSERTING A TERMINAL STRIP WITH 4 TERMINALS ON PAGE 1

You will now insert four **terminals** in column 8 right below the first five terminals.

Quick guide:

1.	The **Terminals** symbol folder is open.
2.	Select the **TER S1 2C** symbol.
3.+	Select the place on the page where you want to insert the terminal strip (the symbol is attached to the cursor).
4.+	Click to insert the symbol (in Cell D8). The terminal must be aligned with the motor's connections.
	The **Component Properties** dialogue box is displayed (first terminal), change as described:
5.>	Product (-)
6.#	TB1
7.>	Terminal Number
8.#	6
	Terminal number 6 is suggested. Accept it.
9.>	Terminal Sorting
10.#	6
	Terminal index 6 is suggested. Accept it.
11.>	**OK**

Right-click to exit the insertion mode.
12.   Insert three more terminals aligned with the motor's connections.

The numbers 7, 8 and 9 are assigned automatically to the next three terminals (if you choose not to copy the first terminal, type "TB1" in the **"Product (-)"** fields of the respective **Component Properties** dialogues).
Move the potentials, if necessary, so there is enough place for all components.
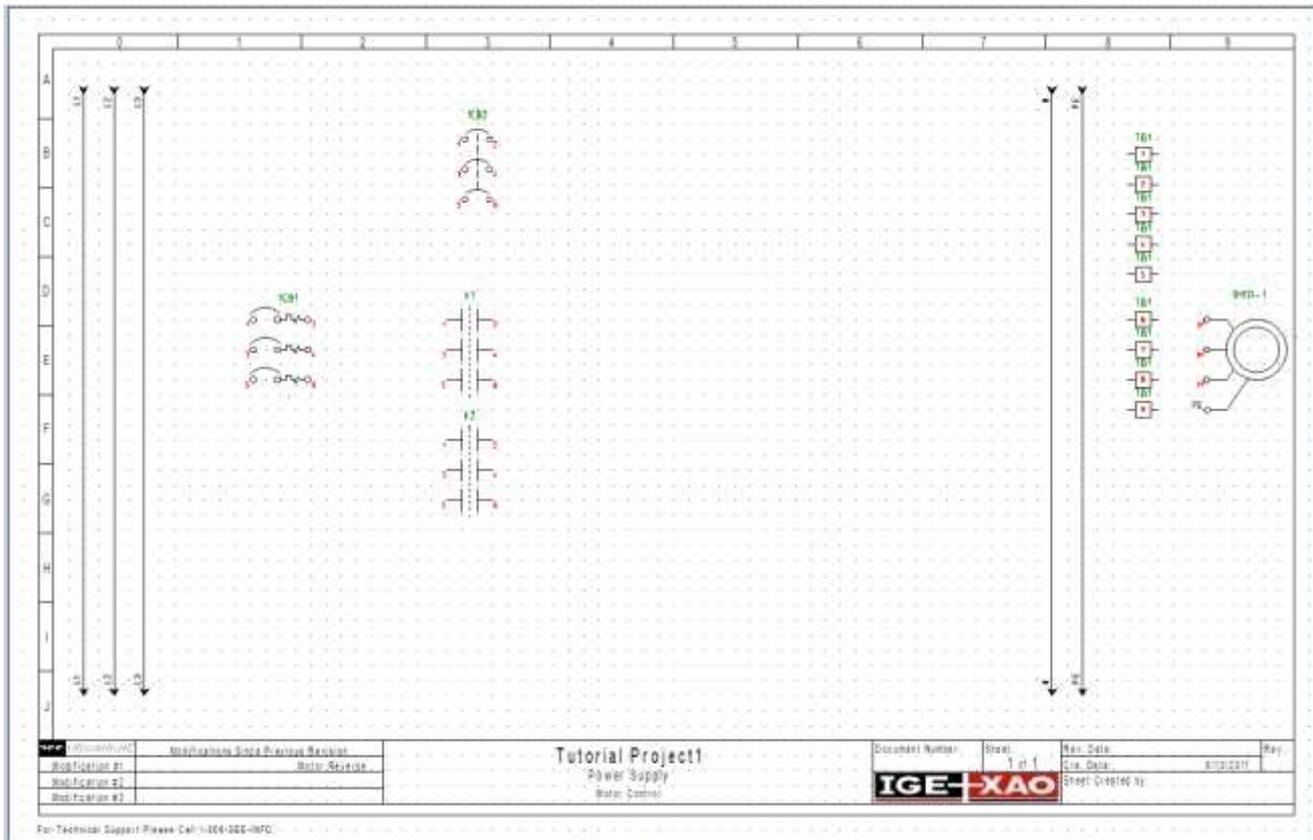
D.1.10. CONNECTING SYMBOLS ON PAGE 1

You will now connect the inserted symbols with each other and with the potentials.

Attention!

You must draw wires and not lines because wires are regarded by SEE Electrical as real electrical connections but lines are not.

First, you will draw a 3 wires connection between the potentials L1, L2 and L3 and the terminals TB1:1, TB1:2 and TB1:3.

Quick guide:

1.CA   **Electrical IEEE**
2.CO   **3 Wires** (**Wire Connections** panel)
3.+   Select the starting point of the wire on the potential L1 strictly aligned with terminal TB1:1 by clicking the left mouse button.
4.+   Select the second point of the wire by clicking the right connection of terminal TB1:1.

In addition to the connection between L1 and TB1:1, *SEE Electrical* draws automatically two more connections: between the potential L2 and terminal TB1:2, and between the potential L3 and terminal TB1:3.
The connections are automatically broken at the symbol places (for example, at the main circuit breaker).
If the components are not aligned, drag them to the desired place.

Now you will draw a 3 wires connection between the potentials L1, L2 and L3 and the motor.

Quick guide:

1.   The **3 Wires** command is still active. Keep on drawing.
2.+   Click to select the starting point of the wire on the potential L1 strictly aligned with terminal TB1:6 and motor connection U1.
3.+   Select the second point of the wire on connection U1 of the motor.

Now you will connect terminal TB1:4 with the potential N, and terminal TB1:5 as well as the motor connection PE with the potential PE.
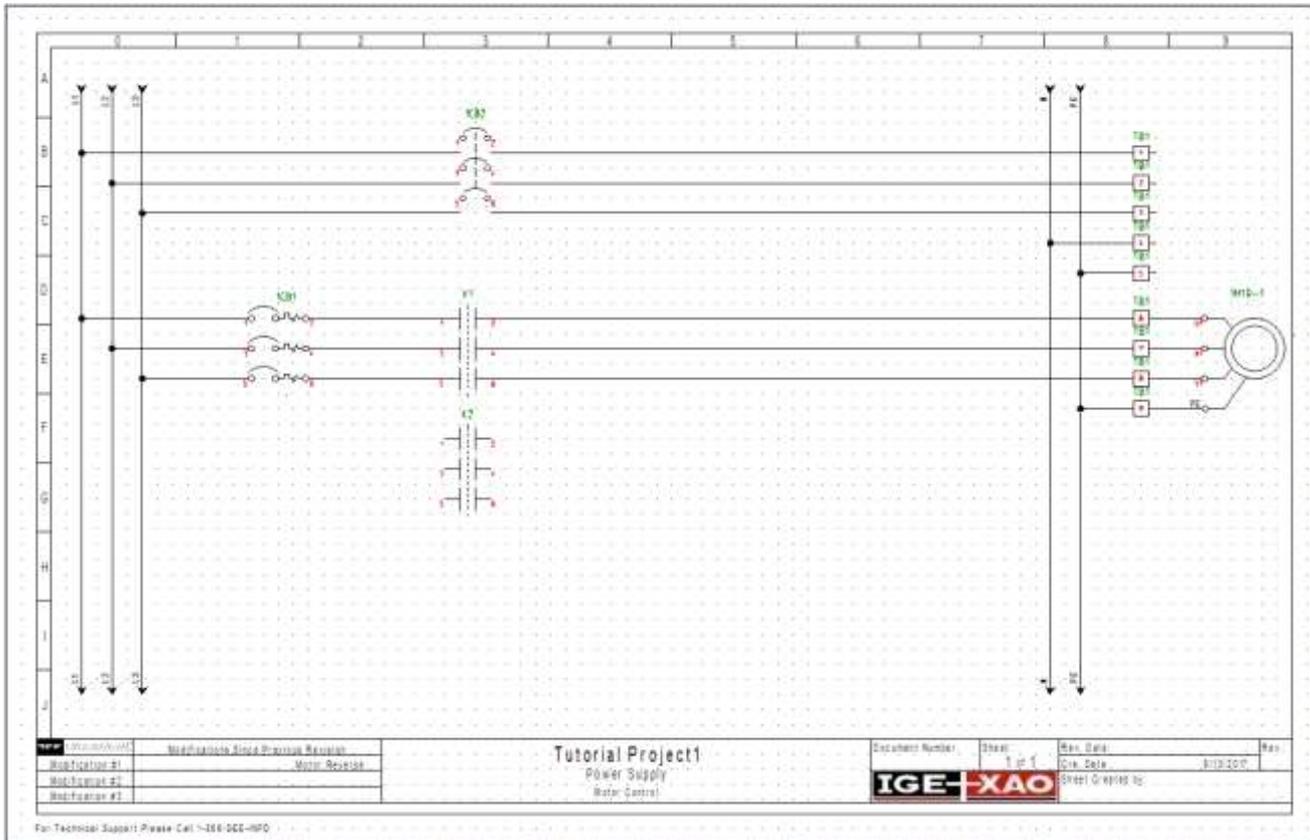
Quick guide:

1.CA   **Electrical IEEE**
2.CO   **1 Wire** (**Wire Connections** panel)
3.+   Select the starting point of the wire on the potential N aligned with the terminal TB1:4 by clicking the left mouse button.
4.+   Select the second point of the wire on the left connection of terminal TB1:4 by clicking the left mouse button again.

5.   The **1 Wire** command is still active. Now, draw the wire between the potential PE and the left connection of terminal TB1:5, as described above.
6.   The **1 Wire** command is still active. Draw the wire between the potential PE and the motor connection PE.
           Right-click to exit the wire drawing mode.

Hint

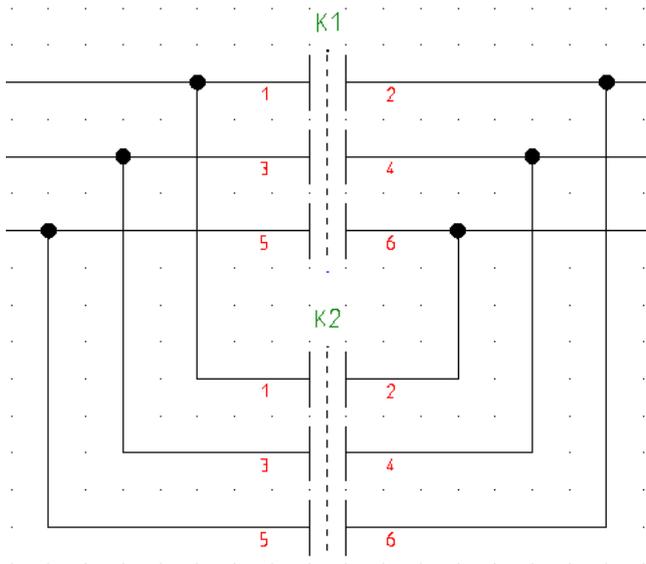*You can activate the **3 Wires** functionality by using the **CTRL + 3** key combination, and you can activate the **1 Wire** functionality by using the **CTRL + 1** key combination.*

Wires for reversal of rotation direction

You will now draw connections from the horizontal wires in rows D and E, through the three-pole contactor in rows F and G, and back to the horizontal wires in rows D and E.
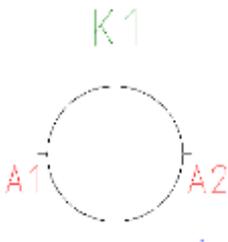
Quick guide:

You can draw the wires by using the **1 Wire** command.
1.CA   **Electrical IEEE**
2.CO   **1 Wire** (**Wire Connections** panel)
3.+   Select the starting point of the wire on the horizontal wire on the left of K1/ connection 1.
4.+   Move the cursor down until aligned with connection 1 of K2 of the main relay-contact, and click to set a corner point.
5.+   Go horizontally to the right of connection 2 of K2 and click to create the second corner point.
6.+   Complete the wire creation by clicking on the right of connection point 6 of K1.
7.+   Repeat the process for the other connection points: K1/5 through K2/5/6 to K1/2 and K1/3 through K2/3/4 to K1/4.
        Right-click to exit the wire drawing mode.

D.1.11. INSERTING A RELAY COIL ON PAGE 1

You will now insert a **relay coil** in column 6 on page 1.

Quick guide:

1.   Open the **Relay** symbol folder from **Electrical & Automation IEEE**.
2.   Select the **Coil** symbol.
3.   Select where on the page you want to insert the relay coil (the symbol is attached to the cursor).
4.+   Click with the left mouse button to insert the symbol (cell H6).
        Right-click to exit the insertion mode.

Changing the relay coil type:

Quick guide:

1.+   Double-click the relay coil.
        The symbol is highlighted in red. The **Component Properties** dialogue box is displayed.
2.>   Product (-)
3.#   K1
4.   Type
5.#   3TB4011
        This is an example of a type.

6.> **OK**

A contact cross appears automatically on the right of the potentials, displaying the main references of the existing relay-contacts. If, later on, you assign additional contacts to the relay coil, their corresponding references are automatically added in the contact cross.


Hint

The relay coils and the assigned contacts are displayed in the list of contacts. Using the list of contacts, you can easily recognize contacts not assigned to coils and vice versa. For example, you have drawn a contact NO named 1K5 in the circuit diagram, but you have not inserted a relay coil with the same name. You will see the contact NO in the list of contacts but a coil is not shown above.

D.1.12. CONNECTING THE RELAY COIL ON PAGE 1

You will now connect the relay coil **K1** with the potentials **L3** and **N**.

Quick guide:

1.CA **Electrical IEEE**
2.CO **1 Wire** (**Wire Connections** panel)
3.+ Select the starting point of the wire on the potential L3 strictly aligned with the relay coil's connections.
4.+ Finish the wire on potential N.
The connection is cut at the relay coil. The nodes at the potentials appear automatically.
Right-click to exit the wire drawing mode.
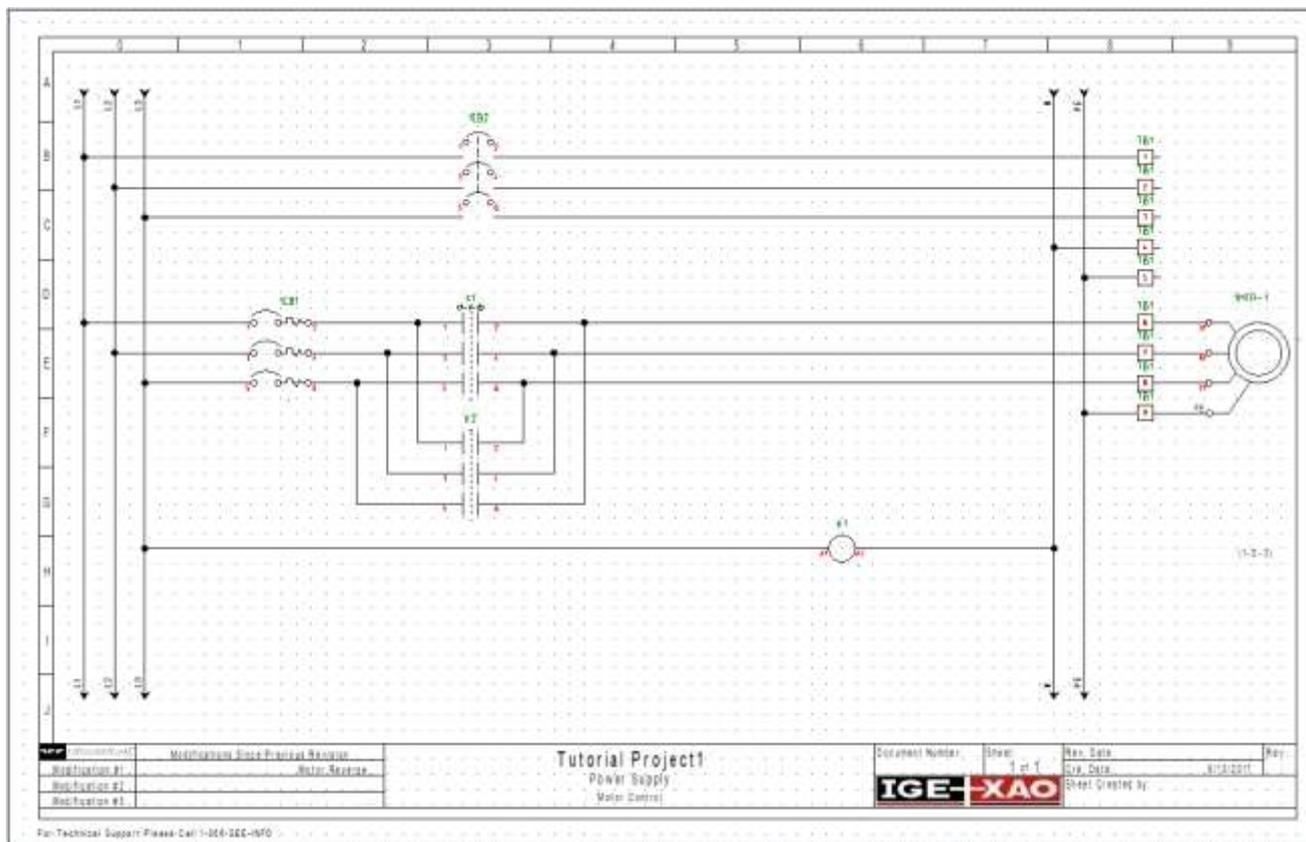
D.1.13. INSERTING A CIRCUIT BREAKER IN A CONNECTION ON PAGE 1

So far, you have inserted symbols and connected them with wires.
You will now try to insert symbols on existing wires.
Every time you insert a symbol on a wire, the wire will be automatically cut and the symbol will be connected correctly.

Hint

If SEE Electrical does not *cut the wire or cable when you insert a symbol, this means that you have used by mistake an ordinary line instead of a wire to connect your symbols.*

You will now insert a **push button** in column 3 on the existing wire.
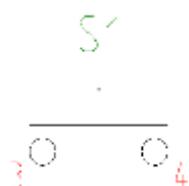
Quick guide:

1.   Open the **Push Button** symbol folder in **Electrical & Automation IEEE v2** library.
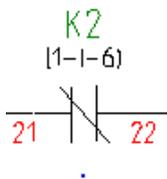2.   Select the **Push Button Contact NO** symbol.
3.+   Select the place where you want to insert the switch (the symbol is attached to the cursor).
4.+   Click to insert the symbol on the wire which connects the coil in cell H3.
5.>   Product (-)
6.#   S1
7.>   Type
8.#   TPS
                This is an example of a type.
9.>   **OK**
10.   Right-click to exit the wire insertion mode.

D.1.14. INSERTING A BREAK CONTACT ON PAGE 1

You will now insert the **break contact** symbol in column 5.

```
 K2
(1-I-6)

       ||
21 ----/| 22
       |
```

Quick guide:

1.   Open the **Relay** symbol folder in **Electrical & Automation IEEE** library.
2.   Select the **Contact NC** symbol.
3.+   Select the place in the drawing area where you want to insert the symbol (the symbol is attached to the cursor).
4.+   Click the left mouse button to insert the symbol (on the right of the push button - in cell H5, for example).
                SEE Electrical opens automatically the ***Component Properties*** dialogue box.
                Assign the contact to a relay coil.
5.>   Product (-)
6.#   K2 (the relay coil will be created in row I).
7.>   Connection 00
8.#   21
                Enter the contact number of the connection.
9.>   Connection 01
10.#   22
                Enter the contact number of the second connection.
11.>   **OK**
                Right-click to exit the insertion mode.

D.1.15. COPYING A ROW ON PAGE 1

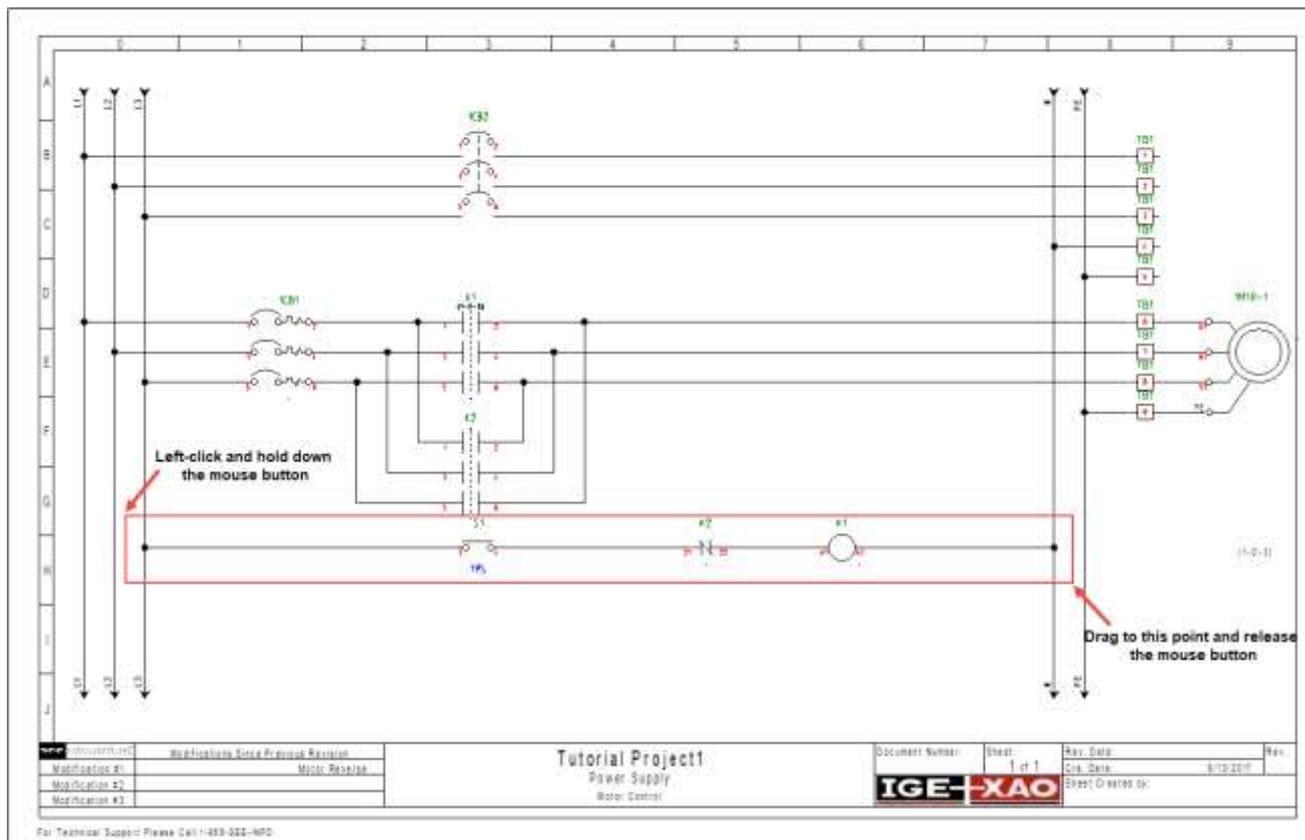You have now drawn all the elements in **Row H**.
Row I will be exactly like **Row H**, but the component names of the symbols will be changed.
Therefore, it is easier to copy everything from **Row H** to **Row I**.
There are several ways of copying but the easiest one is described below.

Quick guide:
You must select all the symbols in **Row H** within a frame as shown below:

1.+   Select the first point of the frame by clicking with the mouse at the top left corner of the frame.
2.+   Keep the left mouse button pressed and drag, so that all the symbols available in row H are included in the frame.
3.+   Release the left mouse button when you reach the bottom right corner of the frame.
4.   The selected symbols are highlighted in red.
5.   Move the cursor near to the top node. Click the wire and hold down the left mouse button while moving the group. The selected symbols and wires are attached to the cursor. The point attached to the cursor is the point where the cursor was placed at the beginning of this step.
6.   Move the group to the position where you want to insert it (**Row I**).
7.+   Press and hold down the **CTRL** key (*Windows* standard procedure: Copy while moving) when releasing the left mouse button to place the group.
        The group is copied to **Row I**.
8.#   Type S2 in the *"Product (-)"* field and TPS in the *"Type"* field for the new push button.
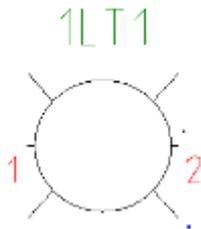
9.#   Type **K1** in the **"Product (-)"** field for the new contact.
                  The contact is assigned to relay coil K1.

10.#   Type **K2** in the **"Product (-)"** field for the new coil.

The cross-references in the contact cross of the relay coil are automatically updated. **Row I** is now an exact copy of **Row H**.
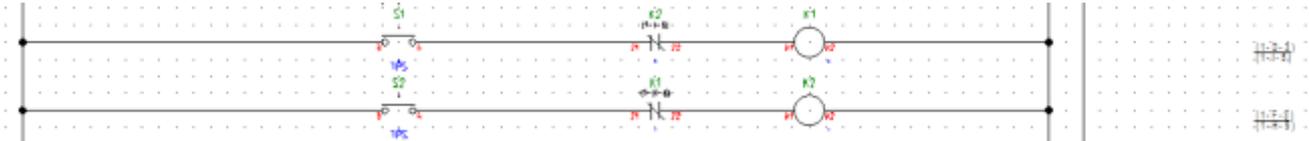
D.1.16. INSERTING A LAMP ON PAGE 1

You will now insert a **lamp** in Row I column 6.

Quick guide:

1.   Open the **Lamps / Lights / Indicators** symbol folder.
2.   Select the **Pilot Light** symbol.
3.+   Select the place where you want to insert the lamp (the symbol is attached to the cursor).
4.+   Click the left mouse button to insert the symbol below the K2 coil.
                  Right-click to exit the insertion mode.
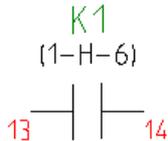
Changing the type of the lamp:

Quick guide:

1.+   Double-click the lamp.
                  The symbol is highlighted in red. The **Component Properties** dialogue box is displayed.
2.>   Type
3.#   ZLA558
                  This is an example of a type.
4.>   **OK**

D.1.17. INSERTING A RELAY CONTACT ON PAGE 1

You will now insert a **NO relay-contact** in column 5.
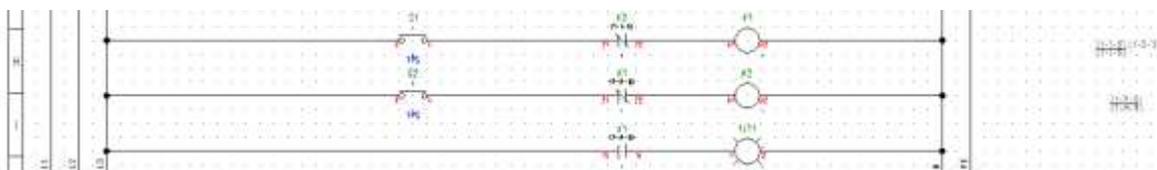

Quick guide:

1.	Double-click the **Relay** symbol folder.
2.	Select the **Contact NO** symbol by clicking the left mouse button.
3.+	Select the place where you want to insert the symbol (the symbol is attached to the cursor).
4.+	Click the left mouse button to insert the symbol. The contact must be aligned with the lamp's connections.
5.	In the dialogue box, assign the contact to the appropriate relay coil.
6.>	Product (-)
7.#	K1
	This symbol is only applied when associated with a relay coil. You must insert manually the numbers of the connection text. For example:
8.>	Connection 00
9.#	13
	Type in the contact number of the first connection.
10.>	Connection 01
11.#	14
	Type in the contact number of the second connection.
12.>	**OK**
	Right-click to exit the insertion mode.

Drawing a wire in row I
Now you will connect the potentials L3 and N together in row I.

Quick guide:

1.CA	**Electrical IEEE**
2.CO	**1 Wire** (**Wire Connections** panel)
3.+	Select the starting point of the wire on the potential L3 strictly aligned with the lamp and the contact.
4.+	Finish the wire on potential N.
	The connection is cut at the lamp as well as at the relay contact NO. The nodes at the potentials appear automatically.
	Right-click to exit the wire drawing mode.

D.1.18. INSERTING TERMINALS ON PAGE 1

You will now insert four **terminals** in Row H and Row I.
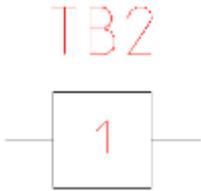
Quick guide:

|	
1.	Open the **Terminals** symbol folder from **Electrical & Automation IEEE v2** library.
2.	Select the **TER S1 2C** symbol.
3.+	Select the place where you want to insert the terminal TB2 (at the start of row H, the symbol is attached to the cursor).
4.+	Click the left mouse button to insert the symbol.
	The *Component Properties* dialogue box is displayed.
	Type in the following data:
5.>	Product (-)
6.#	TB2
7.>	Terminal Number
8.#	1 (the first number available in the terminal strip)
9.>	Terminal Sorting
	The terminal index is used to sort the terminals in the list of terminals.
10.#	1
	You can enter a type in the *"Type"* field.
11.>	**OK**
12.+	Insert the terminal TB2 (in row H, after the relay coil).
13.>	Product (-)
14.#	TB2
15.>	**OK**
	SEE Electrical automatically increases the terminal number and terminal index (both +1). Accept the suggestion.
	Right-click to exit the insertion mode.

Copying terminals

Copy the two terminals you have just inserted.

Quick guide:

1.+	Select the top terminal in row H.
2.#	Press the **CTRL** key and hold it down (*Windows* standard procedure: Add to selection).
3.+	Select the right terminal in row H.
	The selected symbols are highlighted in red.
4.+	Position the cursor near the top connection of the top terminal. Press the left mouse button and hold it down while moving the mouse.

The highlighted symbols are attached to the cursor. The point attached to the cursor is the point where the cursor was placed at the beginning of this step.

5.# Press and hold down the **CTRL** key (*Windows* standard procedure: Copy using Drag and Drop)

6.+ Drag the symbols to the desired position (row I), and drop them by releasing the left mouse button and the **CTRL** key.
The *Component Properties* dialogue is displayed.
The terminal strip name (TB2) is suggested in the *"Product (-)"* field and "3" is suggested in the *"Terminal Number"* and *"Terminal Sorting"* fields.

7.> **OK**
The *Component Properties* dialogue closes.
The terminal strip name (TB2), terminal number 4 and terminal index 4 are automatically assigned to the other terminal.
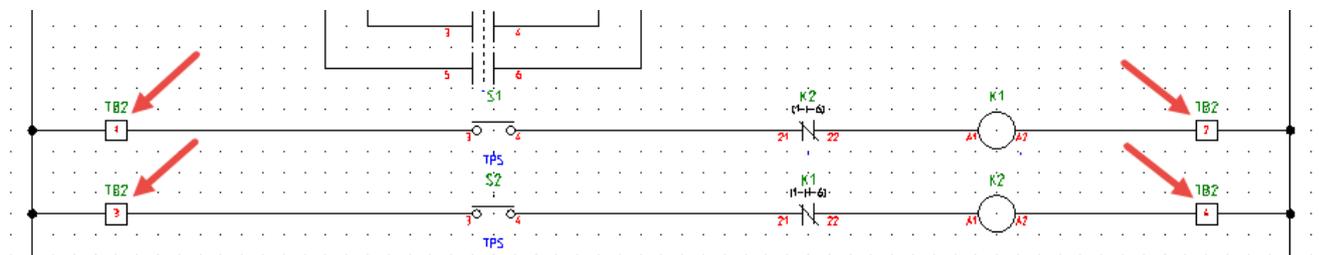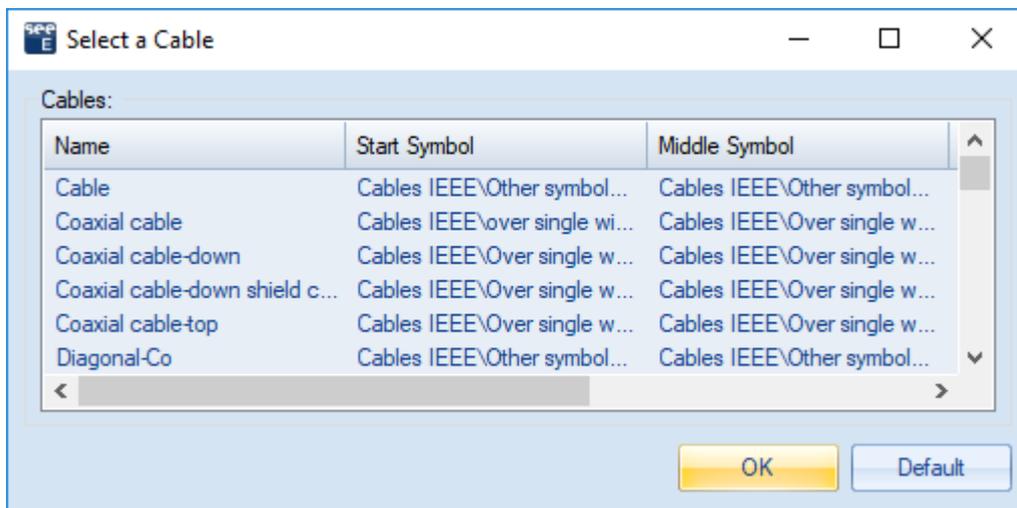

D.1.19. DRAWING A CABLE ON PAGE 1

You will now insert a **cable** between terminal strip TB1 and motor 1MTR-1:

Quick guide:

1.CA **Electrical IEEE**
2.CO **Cable** (**Cable** panel)
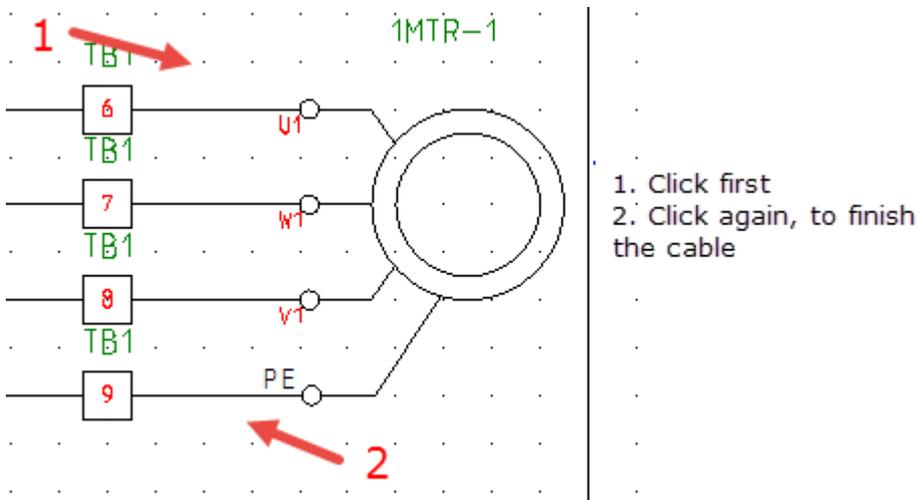The *Select a Cable* window is displayed.

3.> Click the **Default** button.
Cables must run across wires, but not across symbols.

4.+ Select the starting point of the cable.
5.+ Select the ending point of the cable.

The **Component Properties** dialogue of the cable is displayed. It allows you to fill in the information for all cable cores.

Type in the desired information for the cable:

6.> Product (-)
7.# W1
8.> Type
9.# U-1000 R2V 4G1,5
10.> Cable-core No.
11.# 1

The cores are numbered in succession, from left to right, starting with 1 for each new cable.

12.# Cable-core Colour

Select a color from the drop-down list. For example: RD (red). You can do that for all cable cores.

13.# Cable-core Size

Select a size from the drop-down list. For example: 1.5 (1.5 mm^2). You can do that for all cable cores.

14.> **OK**

Right-click to exit the cable insertion mode.

Hints

According to IEEE Std 91/91, the letter code for cables must be "W".
If you use the advanced level of SEE Electrical and you have set user-defined cables via the **Cables setup…** *button in the* **Cables** *tab of the* **Circuit Diagrams (IEEE) Properties** *window,*

the **Electrical IEEE** ➤ **Cable** ➤ **Cable** *command allows you to insert a predefined cable.*

Select the desired predefined cable type, or click the **Default** *button.*

D.1.20. PAGE 1 ILLUSTRATED

You have now drawn the first page in this workspace example. The page is presented below:
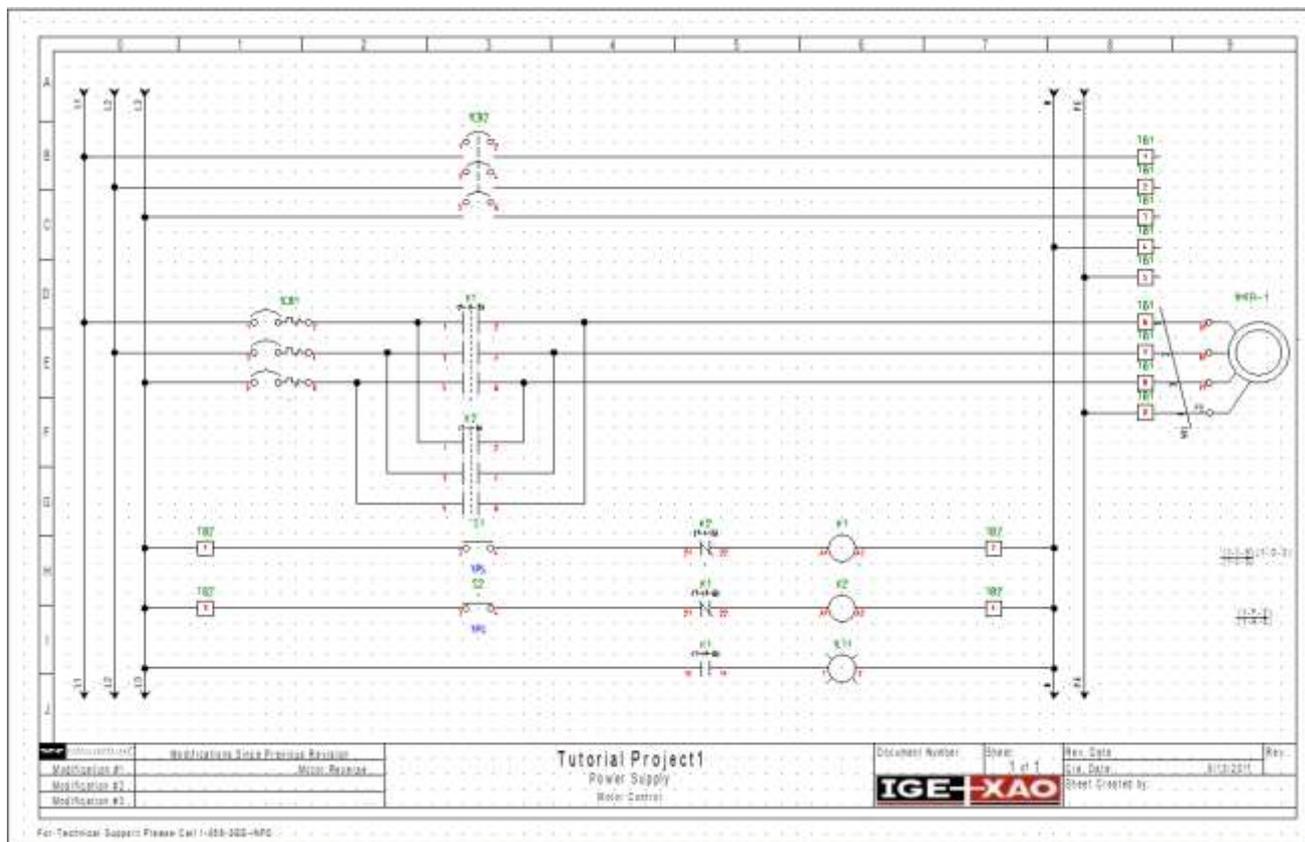
Saving the workspace

You must save the workspace.

1.   **File ➤ Save**

D.2. DRAWING PAGE 2

This chapter guides you, step by step, in drawing the circuit diagram on page 2.
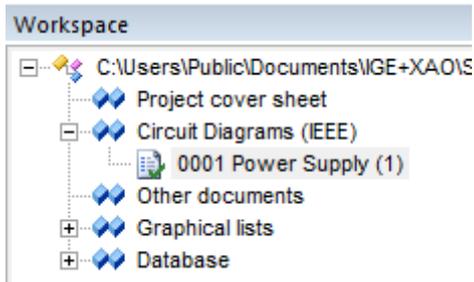
D.2.1. CREATING PAGE 2

You will now create the second page in the workspace.

Quick guide:

1.   Select the ***Workspace*** tab as shown below:

The ***Workspace Explorer*** is displayed:

2.   Right-click the ⊟ ◆◆ Circuit Diagrams (IEEE) module in the ***Workspace Explorer*** and select the **New Page** pop-up command
The ***Page information*** dialogue box is displayed.

Type the following information in the dialogue box:

3.>   Page
4.#   2
                Page number 2 is automatically suggested by *SEE Electrical*.
5.>   Page Description-line 01
6.#   Control

Page information		
Page number	2	
Index		
Page Created Date	9/12/2017	
Page Rev. Date		
Page Revision		
Page Created By		
Page Description-line 01	Control	
Page Description-line 02		
Page Description-line 03		
Page Description-line 04		
Page Description-line 05		
Page Description-line 06		
Rev. Date1		
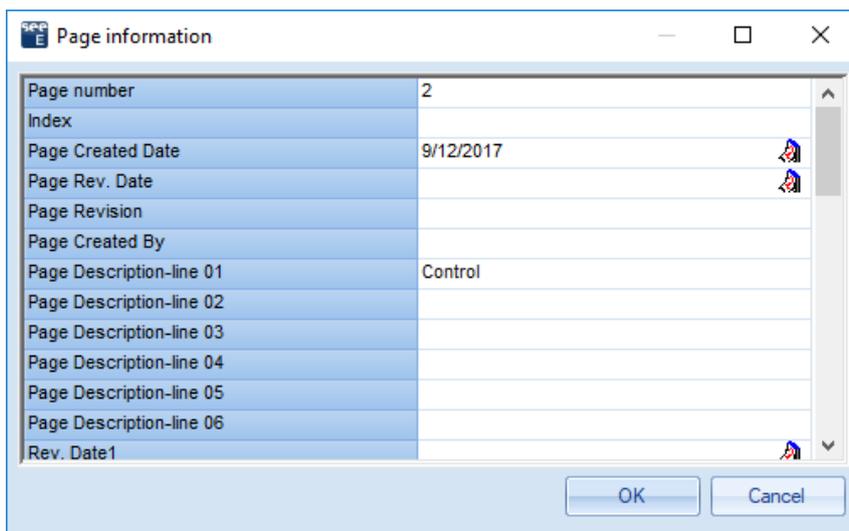
7.>   **OK**
            Page 2 appears on the screen.


Hint

---

*You can switch between pages 1 and 2 by using the **PageUp** and **PageDown** keys.*

D.2.2. SHOWING TWO PAGES SIMULTANEOUSLY

When you copy the symbols from one page to another, it is an advantage to have both pages on the screen together.

Quick guide:

1.　　　Right-click the tab at the top of the drawing area, displaying the name of the first page (Page 001).
　　　　The following pop-up menu appears:
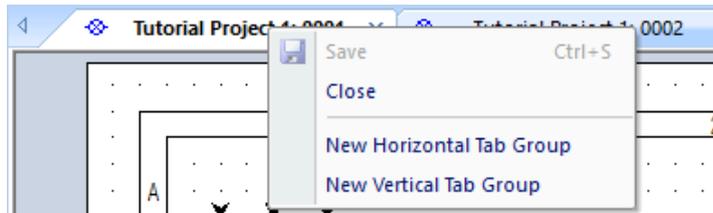
2.　　　Select the **New Horizontal Tab Group** command.
　　　　Both pages are displayed on the screen now.

D.2.3. COPYING POTENTIALS

You will now copy all the potentials from page 1 and insert them on page 2.

Quick guide:

1.+　　　Select the first potential on page 1 (for ex. the left potential L1)
2.#　　　Press and hold down the **SHIFT** key.
3.+　　　Select the other potentials (L2, L3, N and PE) on page 1 (*Windows* standard procedure: Add to selection).
　　　　The selected potentials are highlighted in red.
4.　　　Release the **SHIFT** key.
5.+　　　Position the cursor near the point where you want to drop the copy, i.e. on the left end point of the potential L1. Press and hold down the left mouse button.
6.+　　　Press and hold down the **CTRL** key (*Windows* standard procedure: Create a copy).
7.+　　　"Drag" the copy of the potentials to page 2.
8.+　　　"Drop" the copy in page 2 in the desired place (keep the **CTRL** key pressed at the moment you are placing the copy).
9.>　　　**OK**

SEE Electrical asks the names of the five potentials in succession. You can change the names but do not do it now. Accept the suggested names by clicking **OK**.

The potentials on page 1 receive on their lower side automatically an additional cross-reference to the potentials on page 2. The potentials on page 2 receive on their upper side an additional cross-reference to the potentials on page 1.
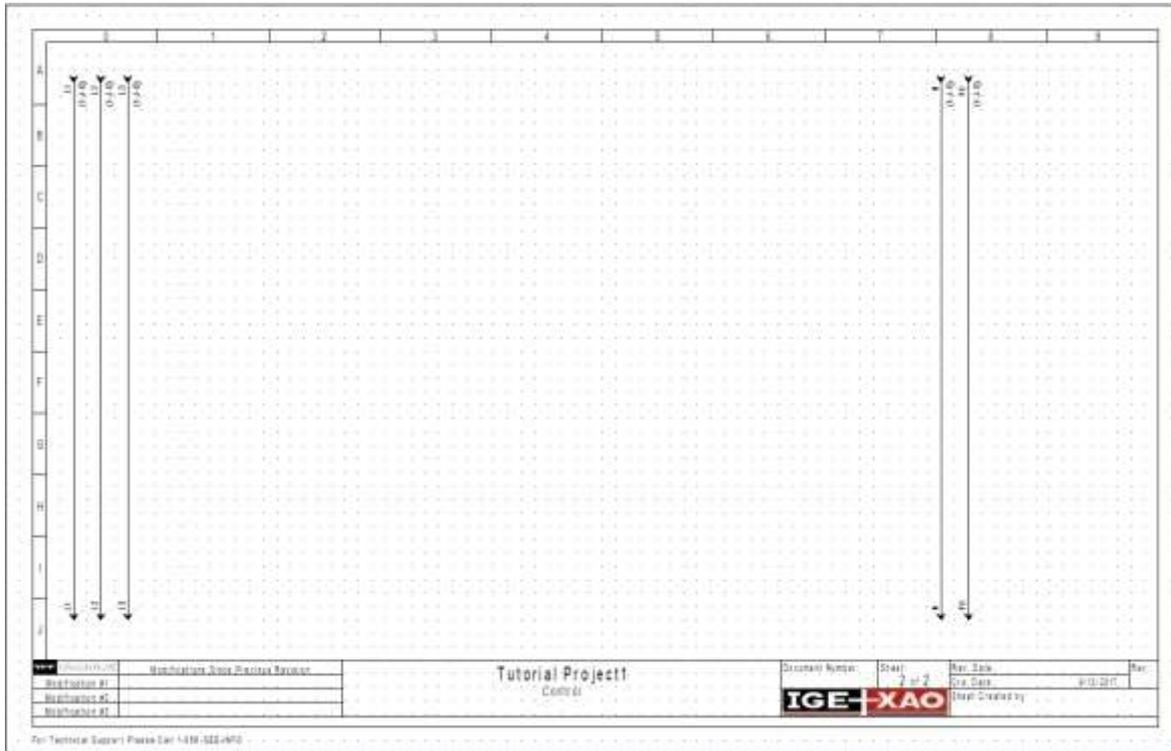

D.2.4. RESTORING THE WINDOW OF PAGE 2

1.   Right-click the tab at the top of the drawing area, displaying the name of the second page (Page 002).
2.   Select the **Move to Next Tab Group** pop-up command.
        The window of Page 002 is restored to its full size.

D.2.5. ELECTRICAL SYMBOLS ON PAGE 2

You will now insert electrical symbols in page 2.
Insert symbols on page 2 in the same way as you did on page 1.
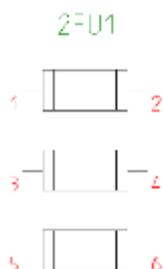Prepare *SEE Electrical* to work with symbols as follows:

1.   Select *Symbols* as shown below:
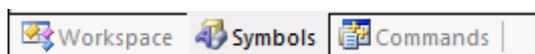
2.   Expand the desired symbol folder, select a symbol and "drag" it with the cursor to the desired place in the page.

D.2.6. INSERTING FUSES ON PAGE 2

You will now insert a **3-pole fuse** in cell B2 and D2.
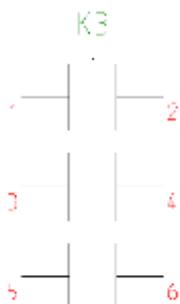
Quick guide:

1.   Open the **Fuse** symbol folder in **Electrical & Automation IEEE v2** library.
2.   Select the **FU3P** symbol.
3.+   Select the place where you want to insert fuse 1 (cell B2). The symbol is attached to the cursor.
4.+   Click the left mouse button to insert the symbol.
5.+   Select the place where you want to insert fuse 2 (cell D2), the symbol is attached to the cursor.
6.+   Click the left mouse button to insert the symbol.
7.   Right-click to exit the insertion mode.
8.+   Double-click the first fuse.
             The symbol is highlighted in red. The **Component Properties** dialogue box is displayed.
9.>   Type
10.#   E3
             This is an example of a type.
11.>   **OK**
             Use the same approach about the second fuse.

D.2.7. INSERTING A CONTACTOR ON PAGE 2

You will now insert **contactors** in columns B4, D4 and F4.

Quick guide:

|	
1.	Open the **Contactor** symbol folder.
2.	Select the **CON3P Slave** symbol.
3.+	Select the place where you want to insert the first contactor (cell B4). The symbol is attached to the cursor.
4.+	Insert the symbol with its contacts aligned with the fuse contacts.
	The *Component Properties* dialogue box is displayed.
	Change the component name.
5.>	Product (-)
6.#	K3 (the relay coil will be placed on page 2 in row G).
7.>	Connection 00
8.#	1
9.>	Connection 01
10.#	2
11.>	Connection 02
12.#	3
13.>	Connection 03
14.#	4
15.>	Connection 04
16.#	5
17.>	Connection 05
18.#	6
19.>	**OK**
	The *Component Properties* dialogue closes.
	Now place the second contactor.
20.+	Select the place where you want to insert the contactor (cell D4). The symbol is still attached to the cursor.
21.+	Insert the symbol with its contacts aligned with the fuse contacts.
	The *Component Properties* dialogue box is displayed again.
21.>	Product (-)
22.#	K4 (the relay coil will be placed on page 2 in row H).
23.#	Enter the same connection numbers as those of contactor K3.
24.>	**OK**
	The *Component Properties* dialogue closes.
25.+	Select the place where you want to insert contactor 3 (cell F4). The symbol is attached to the cursor.
26.+	Click the left mouse button to insert the symbol on the page.
	The *Component Properties* dialogue box is displayed again (for the third contactor).
27.>	Product (-)
28.#	K5 (the relay coil will be placed on page 2 in row I).
29.#	Enter the same connection numbers as those of contactors K3 and K4.
30.>	**OK**
	The *Component Properties* dialogue closes.
	Right-click to exit the insertion mode.

D.2.8. INSERTING A MOTOR ON PAGE 2

You will now insert a **motor** in column 9, on the right of the potentials.
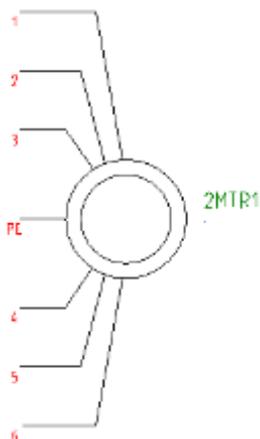
Quick guide:

1.   Open the **Motors** symbol folder from **Electrical & Automation IEEE v2**.
2.   Select the **Motor 6P - 1** symbol.
3.+   Select the position where to insert the motor (aligned with the contact's connections). The symbol is attached to the cursor.
4.+   Click the left mouse button to insert the symbol.
5.+   Right-click to exit the insertion mode.
6.   Click the motor to select it.
7.   Right-click and execute the **Explode** command.
8.   Select the horizontal line of connection 3 along with its connection point.
9.   Press and hold down the **CTRL** key and drag the objects to the middle of the motor, between the two connection groups.
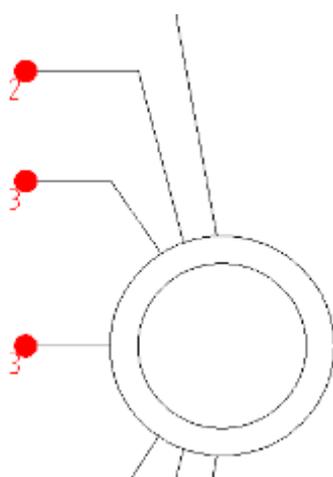
10.   Select the whole motor by using a frame, right-click and then click the **Block…** pop-up command.
The **Block/Component Definition** window is displayed.
Choose **Component** for the block definition and click **OK**.
The **Define component name prefix** dialogue is displayed.

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You can see "MRT" in the input field and you have to click **OK**.

Change the motor type as described below:

11.+ Double-click on the motor.
The symbol is highlighted in red. The **Component Properties** dialogue box is displayed.

12.> Type
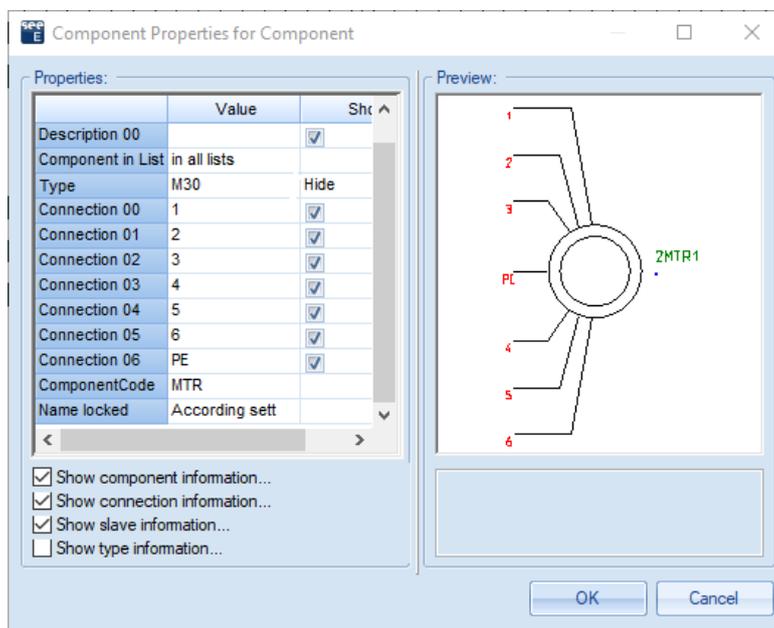
13.# M30
This is an example of a type.
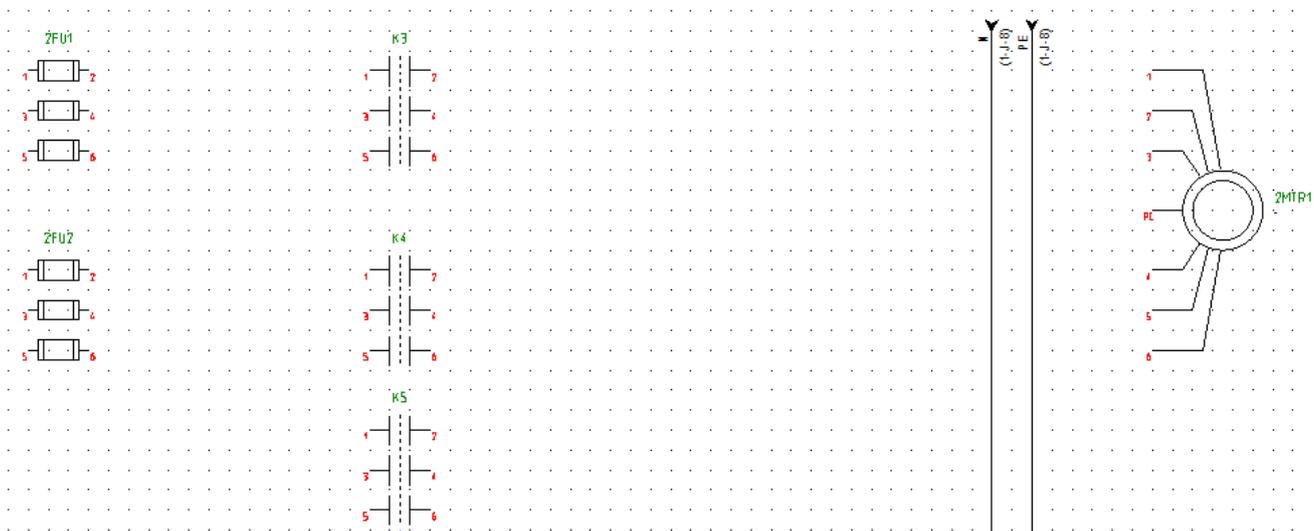
14.> Connection 06

15.> PE
Type in the text **PE** in the *"Connection 06"* field. The other connection texts are filled in automatically. Do not change them.

16.> **OK**

Move some of the symbols if necessary so that they can be perfectly aligned.

D. Drawing Circuit Diagrams

D.2.9. CONNECTING SYMBOLS ON PAGE 2

You will now connect the newly inserted symbols with the potentials.

Attention!

You must draw wires and not lines because wires are regarded by SEE Electrical as real electrical connections but lines are not.

You will draw 3 wires between the potentials L1, L2 and L3 and the motor connections 1, 2 and 3.

Quick guide:

1.CA   **Electrical IEEE**
2.CO   **3 Wires** (**Wire Connections** panel)
3.+   Select the starting point of the wire on potential L1, strictly aligned with connection 1 of the motor.
4.+   Select the second point of the wire on connection 1 of the motor.
        Two additional wires are drawn automatically: from potential L2 to connection 2 and from potential L3 to connection 3.
        The wires are cut at the places where components are located (such as at the contactor).

Hint

You can also use hot keys CTRL + 1 to draw a single wire or CTRL + 3 to draw 3 wires.

Now draw the 3 wires between the potentials L1, L2 and L3 and the connections 4, 5 and 6 of the motor.

Quick guide:

1.   The **3 Wires** command is still active. Draw the next connection.
2.+   Select the starting point of the wire on potential L1, strictly aligned with connection 4 of the motor.
3.+   Select the second point of the wire on the connection 4 of the motor.
        Two additional wires are drawn automatically: from potential L2 to connection 5 and from potential L3 to connection 6.
        Right-click to exit the wire drawing mode.

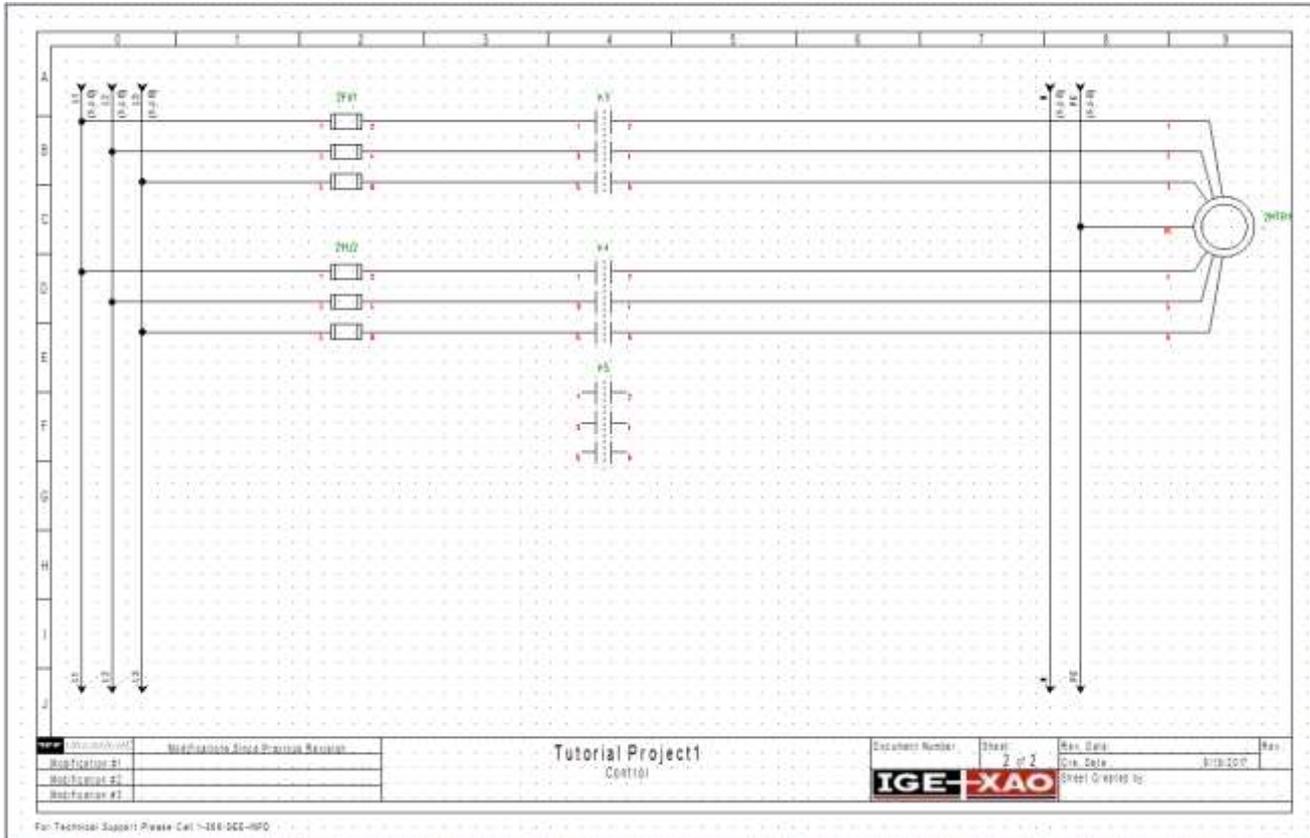You will now draw a wire from potential **PE** to the connection **PE** of the motor.

Quick guide:

1.CA   **Electrical IEEE**

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2.CO   **1 Wire** (**Wire Connections** panel)

3.+   Select the starting point of the wire on the potential PE opposite the connection
            2MTR1/PE (the middle connection of the motor).

4.+   Select the second point of the wire on the PE connection of the motor.

The **1 Wire** command is still active. You can continue to draw the wires to the main contact K5.

Quick guide:

1.   Draw the following connection first:
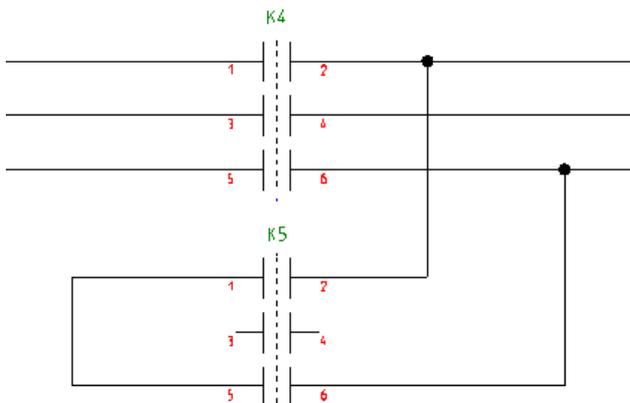
2.+   Set the starting point of the wire on the right of the connection K4/2.

3.+   Move the cursor vertically down to align it with the connection 2 of the main contact K5, and click to set the first corner point of the wire.

4.+   Draw the wire horizontally – to the left of connection K5/1, and click to indicate its second corner point.

5.+   Continue vertically downwards to the point where the wire is aligned with connection K5/5.

6.   Click again to set the next corner point (rightwards from connection K5/6) and then go up to connection K4/6.

7.+   The **1 Wire** command is still active. Start a wire on the right of connection K4/4 (between the two previous wires) and go down until aligned with connection K5/4. Then go left and connect the wire with the vertical part of the previous one.
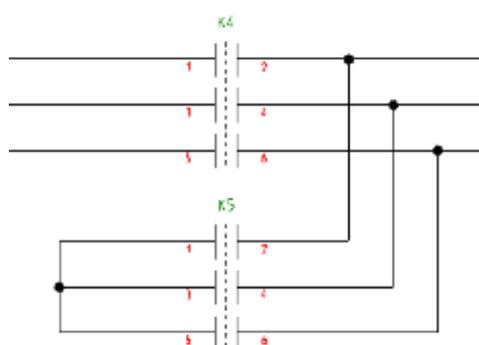
D.2.10. INSERTING TERMINAL STRIPS ON PAGE 2

You will now insert **terminal strips** on the six motor connections.
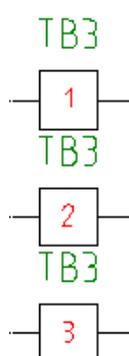
Quick guide:

1.   Double-click the **Terminals** symbol folder from **Electrical & Automation IEEE v2**.

2.   Click the **TER S1 2C** symbol.

3.+   Select the place where you want to insert the first terminal strip. The symbol is attached to the cursor.

4.+   Click the left mouse button to insert the symbol (on the left of connection 1 of the motor and before the potentials).
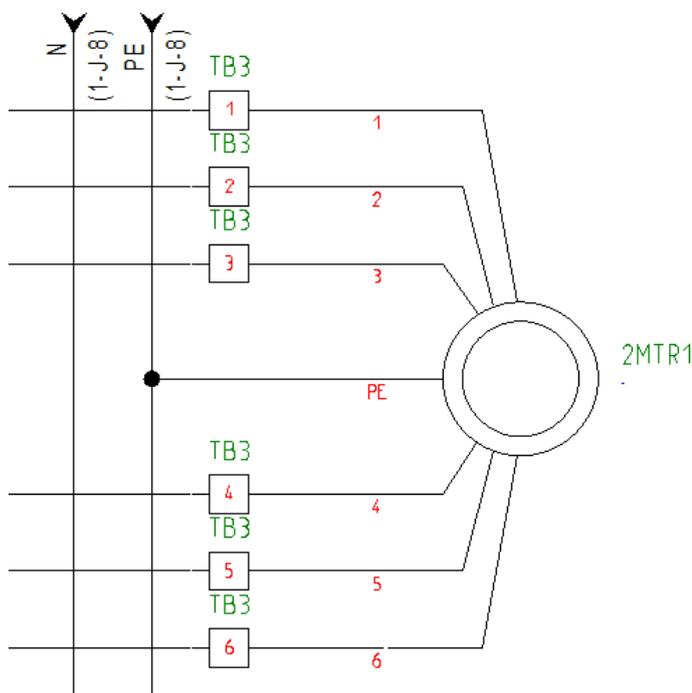The **Component Properties** dialogue box is displayed.

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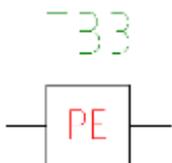
Change the information in it as described:
5.> Product (-)
6.# TB3
7.> Terminal Number
8. 1
9.> Terminal Sorting
10.# 1
If you wish to insert a type, type it in the **"Type"** field.
11.> **OK**
If necessary, move the two potentials 1-2 steps to the left.
Place the terminals of the motor connections 2, 3, 4, 5 and 6.
12.+ Continue inserting terminals on the connections with the exception of the PE connection.
The numbers 2, 3, 4, 5 and 6 are assigned automatically to the respective terminals (if you choose not to copy the first terminal, type "TB3" in the **"Product (-)"** fields of the respective **Component Properties** dialogues).

Hint

---

*Hold the **CTRL** key to copy the first terminal to the next connections. This way you copy the **"Product (-)"** name of the terminal, so you do not have to enter it every time.*

Now insert the single terminal above the motor connection in the middle.

Quick guide:

1.		Double-click the **Terminals** symbol folder from **Electrical & Automation IEEE v2**.
2.		Select the **TER S1 2C** symbol.
3.+		Click the left mouse button to insert the symbol in the desired place (in front of the PE connection of the motor).

The **Component Properties** dialogue box is displayed.

SEE Electrical automatically increases the terminal number and terminal index with +1. However, you must change the terminal number to **PE**.

5.>	Product (-)
6.#	TB3
7.>	Terminal Number
8.#	PE
9.>	Terminal Sorting
10.#	7

If you wish to insert a type, type it in the *"Type"* field.

11.>	**OK**

D.2.11. INSERTING RELAY COILS ON PAGE 2

You will now insert **a relay coil** at the end of rows G, H and I.
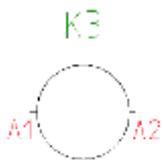
Quick guide:

1.	Double-click the **Relay** symbol folder from **Electrical & Automation IEEE** library.
2.	Click the **Coil** symbol.
3.+	Insert the first relay coil (Row G). The symbol is attached to the cursor.
4.+	Insert the relay coil again (Row H).
5.+	Insert the relay coil again (Row I).

Right-click to exit the insertion mode.

6.#	Double-click on the first relay coil and enter K3 in the *"Product (-)"* field.

A contact cross is placed automatically on the right of the symbol. The existing contacts are shown in the contact cross. If you assign later additional contacts to the relay coil, the corresponding cross-references are added to the contact cross.

|	
7.#	Enter K4 and K5 in the respective *"Product (-)"* fields for the two other relay coils.

D.2.12. CONNECTING THE RELAY COIL ON PAGE 2

You will now connect relay coil **K3** to the potential **L3** and potential **N**.

Quick guide:

1.CA	**Electrical IEEE**	
2.CO	**1 Wire** (**Wire Connections** panel)	
3.+	Select the starting point of the wire on the potential L3, aligned with the connections of the relay coil K3.	
4.+	Place the second point of the wire on the N potential.	
	Right-click to exit the wire drawing mode.	

### D.2.13. INSERTING CIRCUIT BREAKERS ON PAGE 2

You will now insert **switches** in Row G and Row I.
First, you will insert the **Push Button** symbol.

PB?
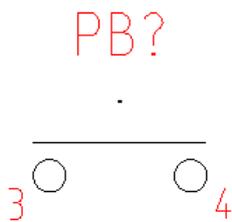
Quick guide:

1.	Double-click the **Push Button** symbol folder in the **Electrical & Automation IEEE v2** library.
2.	Select the **Push Button Contact NO** symbol.
3.+	Select the place where you want to insert the first button (NO) (row G). The symbol is attached to the cursor.
4.+	Click with the mouse to insert the symbol in column 2.
	The *Component Properties* dialogue is displayed.
5.>	Product (-)
6.#	S3
7.>	**OK**
	The *Component Properties* dialogue closes.
8.+	Select the place where you want to insert the second button (NO) (row I). The symbol is attached to the cursor.
9.+	Click with the mouse to insert the symbol in column 2.
	The *Component Properties* dialogue is displayed.
10.>	Product (-)
11.#	S4
12.>	**OK**
	The *Component Properties* dialogue closes.
13.	Right-click to exit the insertion mode.

Next, you will insert a **NC switch** in Row G.
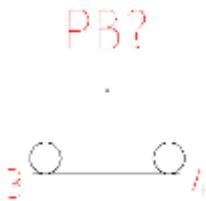
Quick guide:

1.   The **Push Button** symbol folder is still open.
2.   Select the **Push Button Contact NC** symbol.
3.+   Select the place where you want to insert the NC switch (cell G1).
     The *Component Properties* dialogue is displayed.
4.>   Product (-)
5.#   S5
6.>   **OK**
     The *Component Properties* dialogue closes.
7.+   Right-click to exit the insertion mode.

You will now change the type of the circuit breakers.

Quick guide:

1.+   Double-click a circuit breaker.
     The symbol is highlighted in red. The *Component Properties* dialogue box is
     displayed.
2.>   Type
3.#   TPS or TPB
     Assign TPS to the circuit breaker NO, then assign TPB to the circuit breaker NC.
4.>   **OK**
     Use the same approach for all three circuit breakers.

D.2.14. INSERTING CONTACTS NC ON PAGE 2

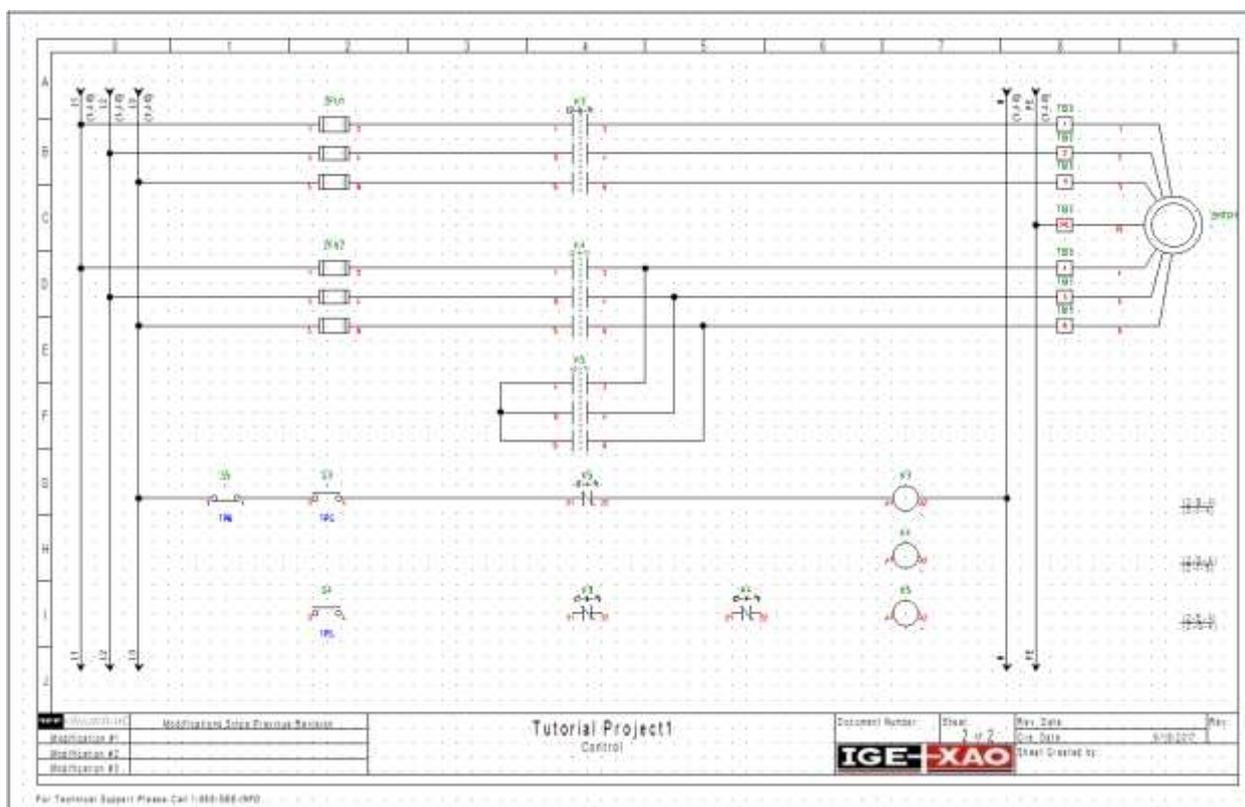You will now insert **break contacts NC** in Rows G and Row I.
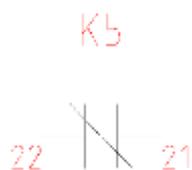
Quick guide:

1.   Double-click the **Contactor** symbol folder to open it.
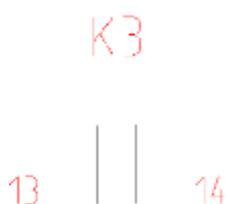2.   Select the **CON1P-2 Slave** symbol.

3.+	Select the place where you want to insert the first break contact. The symbol is attached to the cursor.
4.+	Click the left mouse button to insert the symbol in cell G4.
	In the **Component Properties** dialogue box, assign the contact to the relay coil.
5.>	Product (-)
6.#	K5
7.>	Connection 00
8.#	21
	Fill in the first connection number of the contact.
9.>	Connection 01
10.#	22
	Fill in the second connection number of the contact.
11.>	**OK**
12.+	Insert the second contact in row I right below the K5 contact.
	In the **Component Properties** dialogue box, assign the break contact to the appropriate relay coil.
13.>	Product (-)
14.#	K3
15.>	Connection 00
16.#	21
	Fill in the first connection number of the contact.
17.>	Connection 01
18.#	22
	Fill in the second connection number of the contact.
19.>	**OK**
20.+	Insert another break contact in Cell I5 by clicking the left mouse button.
	In the **Component Properties** dialogue box, assign the break contact to the appropriate relay coil.
21.>	Product (-)
22.#	K4
23.>	Connection 00
24.#	21
	Fill in the first connection number of the contact.
25.>	Connection 01
26.#	22
	Fill in the second connection number of the contact.
27.>	**OK**
	Right-click to exit the insertion mode.

The contacts appear in the contact cross of the relay coil to which they have been assigned.

D.2.15. INSERTING CONTACTS NO ON PAGE 2

You will now insert **contacts NO** in Rows G, H, and J.

Quick guide:

1.	Open the **Relay** symbol folder in **Electrical & Automation IEEE**.
2.	Select the **Contact NO** symbol.
3.+	Select the place where you want to insert the first contact NO in cell G6. The symbol is attached to the cursor.
4.+	Click the left mouse button to insert the symbol. In the *Component Properties* dialogue box, indicate the relay coil to which the contact belongs:
5.>	Product (-)
6.#	K4
7.>	Connection 00

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| 8.# | 13 |
	Fill in the first connection number of the contact.
9.>	Connection 01
10.#	14
	Fill in the second connection number of the contact.
11.>	**OK**
12.+	Select the place where you want to insert the contact NO in cell H2. Click the left mouse button to insert the symbol.
	In the **Component Properties** dialogue box, indicate the relay coil to which the contact belongs:
13.>	Product (-)
14.#	K3
15.>	Connection 00
16.#	13
	Fill in the first connection number of the contact.
17.>	Connection 01
18.#	14
	Fill in the second connection number of the contact.
19.>	**OK**
20.+	Insert the contact again (cell J2) by clicking the left mouse button.
	In the **Component Properties** dialogue box, indicate the relay coil to which the contact belongs:
21.>	Product (-)
22.#	K5
23.>	Connection 00
24.#	13
	Fill in the first connection number of the contact.
25.>	Connection 01
26.#	14
	Fill in the second connection number of the contact.
27.>	**OK**
	Right-click to exit the insertion mode.
	The contacts appear in the contact cross of the corresponding relay coil.

D.2.16. DRAWING WIRES ON PAGE 2

You will now connect the horizontal wire in Row G to the symbols in rows H and I.

Quick guide:

| 1.CA | **Electrical IEEE** |
| 2.CO | **1 Wire** (**Wire Connections** panel) |

Draw the following wire first:
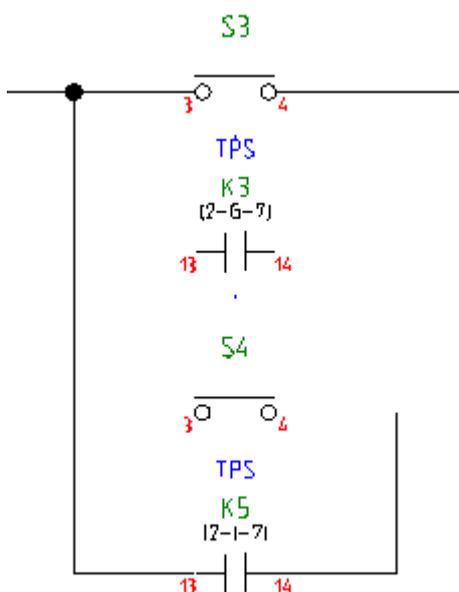
3.+   Select the starting point of the wire on the horizontal connection between S5 and S3 in column 1.

4.+   Draw the wire, going vertically down to row J on the left of connection 13 of the K5 contact NO. Place the corner point of the wire by clicking the left mouse button.

5.+   Draw the wire horizontally through the K5 contact NO in column 2. Go vertically and align the wire with the S4 push button.
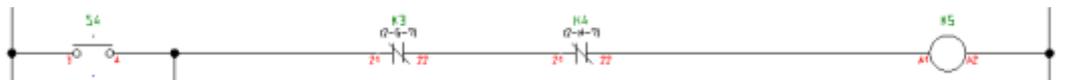
Draw the next connection:
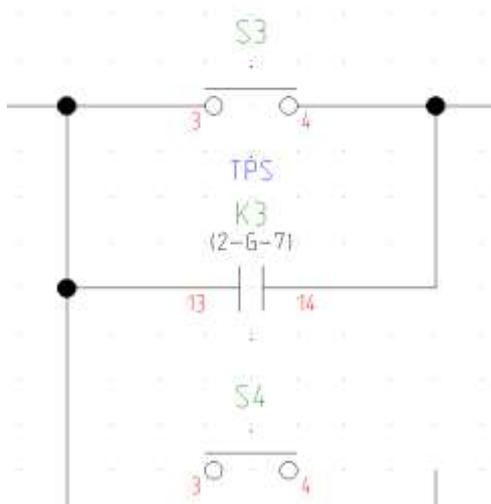
6.+   Select the starting point of the wire on the right of the S3 push button (column 2). Go vertically to row H and align the end of the wire with the K3 connections.

7.+   Continue the wire through K3 to the existing vertical wire in column 1.

Draw the next connection:
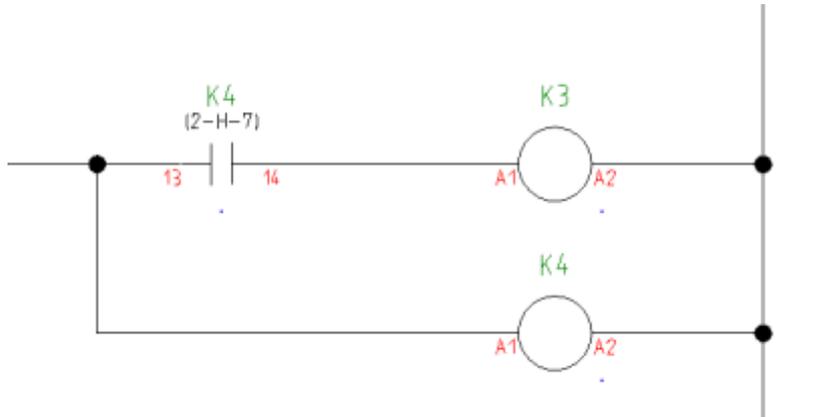
8.+ Select the starting point of the wire on the potential N (on the right of the relay coil K4 in row H).

9.+ Draw the wire horizontally (through the relay coil K4). Place the corner point of the wire by clicking the left mouse button.

10.+ Draw the wire vertically upwards to the existing horizontal connection.

Draw the next connection in row I:

11.+ Select the starting point of the wire on the vertical wire connection on the left of the S4 push button in row I.

12.+ Draw the wire horizontally towards to the potential N. Place the ending point of the wire by clicking the left mouse button.
Right-click to exit wire drawing mode.

D.2.17. DRAWING A CABLE ON PAGE 2

You will now insert a **cable** between terminal strip TB3 and motor 2MTR1.

Quick guide:

1.CA **Electrical IEEE**
2.CO **Cable** (**Cable** panel)
Cables must run across wires, not across elements of symbols.
3.+ Select the starting point of the cable.
4.+ Select the ending point of the cable.
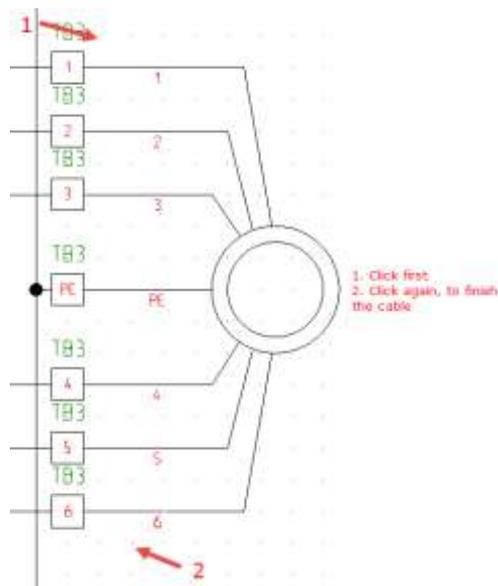
The **Component Properties** dialogue of the cable is displayed. It allows you to fill in the information for all cable cores.

Fill in the desired information of the cable:

5.>   Product (-)
6.#   W2
7.>   Type
8.#   U-1000 R2V 12G1,5²

This is an example of a type.

9.>   Cable-core No.
10.#   1

The cores are numbered in succession, from left to right, starting with 1 for each new cable.

11.#   Cable-core Colour

In case a valid type has been selected, the cable core colors are filled in according to the information from the type database (*Standard* and *Advanced*).

12.#   Cable-core Size

In case a valid type has been selected, the cable core sizes are filled in according to the information from the type database (*Standard* and *Advanced*).

13.>   **OK**
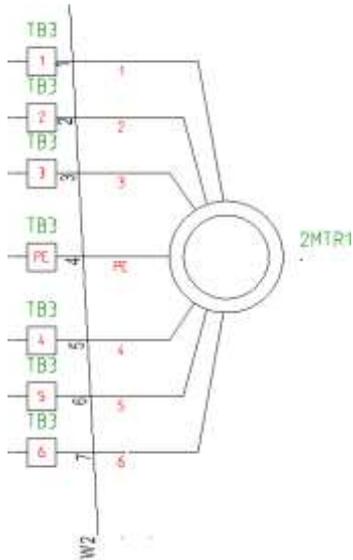
Right-click to exit the cable insertion mode.

Hints

According to IEEE Std 91/91, the letter code for cables must be "W".
If you use the advanced level of SEE Electrical and you have set user-defined cables via the
Cables setup… *button in the* ***Cables*** *tab of the* ***Circuit Diagrams (IEEE) Properties*** *window,*
the **Electrical IEEE ➤ Cable ➤ Cable** *command allows you to insert a predefined cable.*
Select the desired predefined cable type, or click the ***Default*** *button.*

D.2.18. PAGE 2 ILLUSTRATED

Congratulations! You have now completed the second page in the workspace example.
The page is illustrated below:
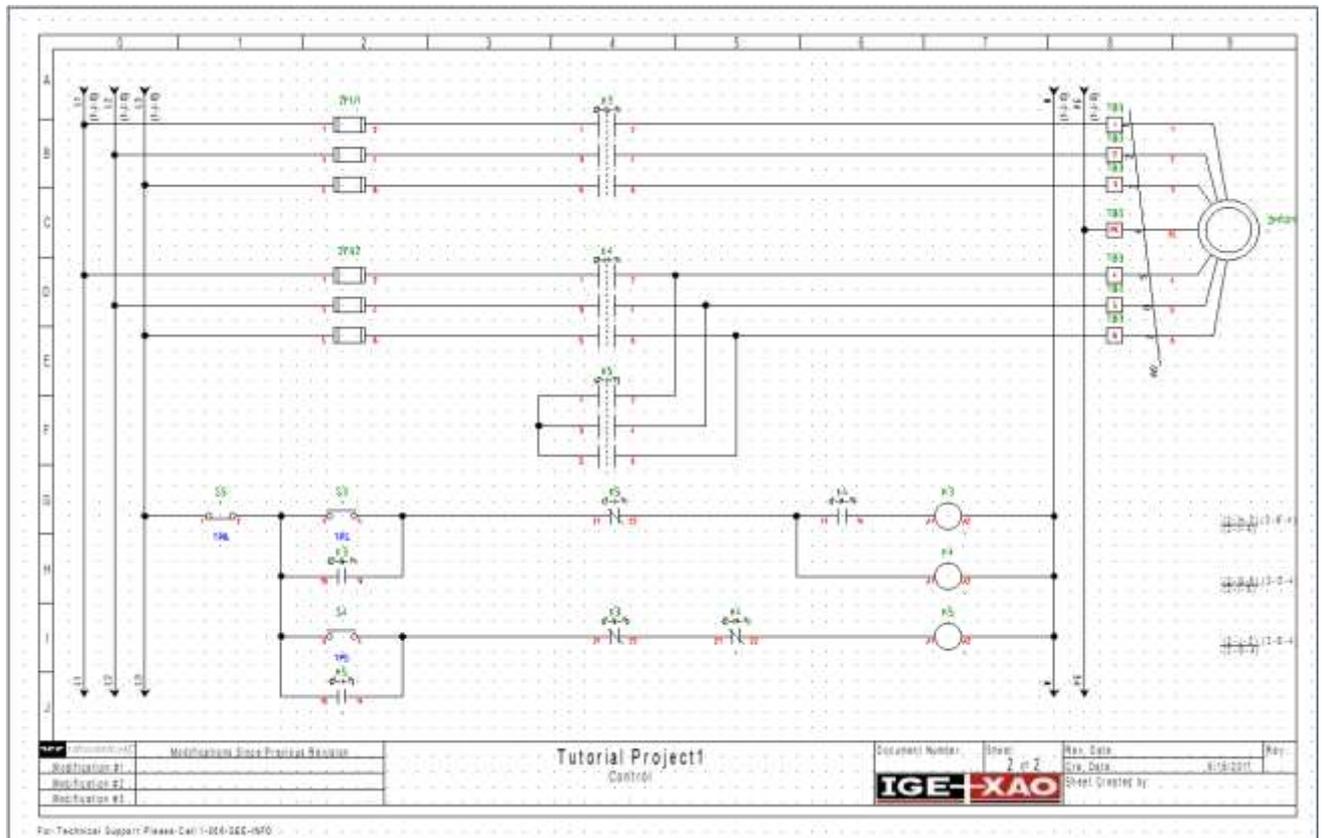
Saving the workspace

You must save the workspace.

1.   **File ➤ Save**

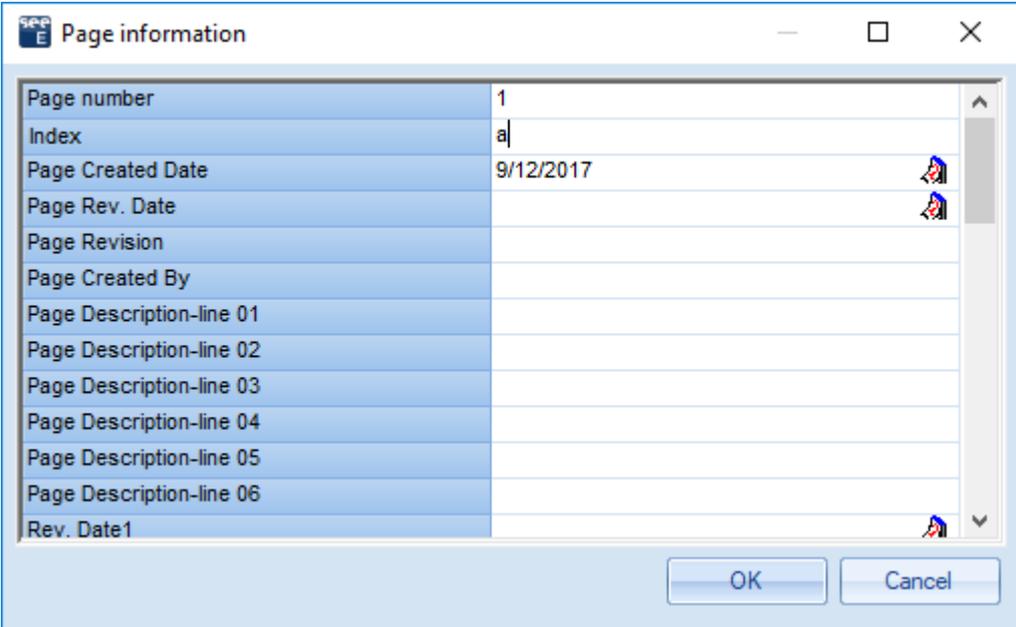## E   ADDITIONAL PROCESSING OF CIRCUIT DIAGRAMS

E.1. *PAGE INDEX*

If an installation has just been built, it is often necessary to add pages in order to have additional circuit parts in the project. If a page numbering for the component names is used, then the names of the components which are already installed must not be changed.
The page index allows inserting pages without changing the numbers of the existing ones.

You will now insert page 1a in the workspace.

1.   Create a new page using the same approach as for the creation of page 2.


2.>   Page
   Change the page number.
3.#   1
4.>   Index
5.#   a
           Type in the page index.
6.>   **OK**
           The page has been created.

Place a symbol of a lamp on page 1a. It is automatically named 1aLT1, because in our example the component names are created using the page number. When you draw the potential L1 on page 1a, the cross-references on pages 1 and 2 will be updated. The same happens to the cross references of coils and contacts. They will also be updated using the information of the page index.
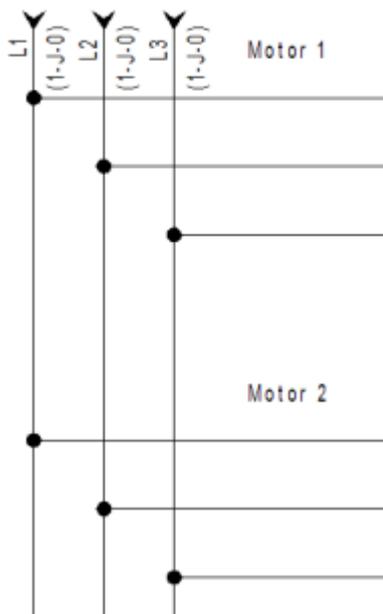
Page 1
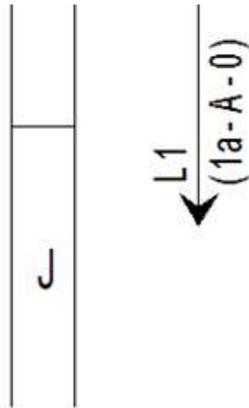
Page 1a
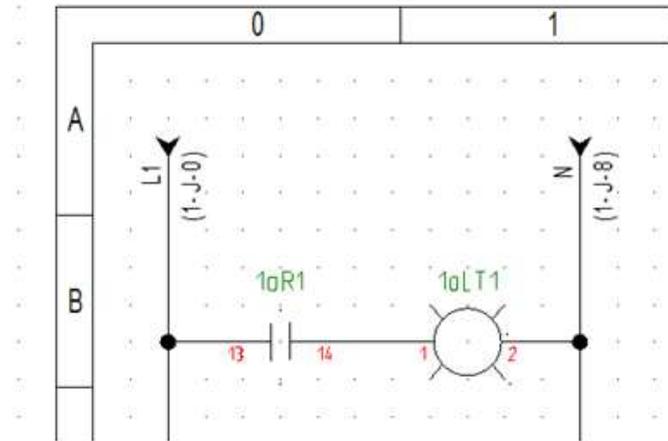
Saving the workspace

You must save the workspace.

1.   **File ➤ Save**

E.2.   TEXTS

You can insert comment texts in a page. Insert the texts "Motor 1" and "Motor 2" in page 2.
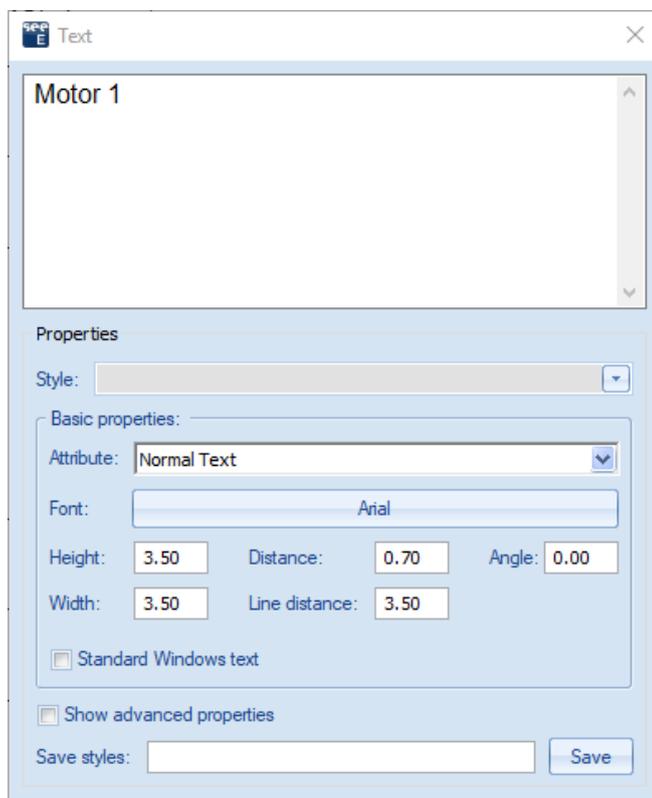
1.CA	**Draw**
2.CO	**New Text** (**Elements** panel)
	The *Text* dialogue is displayed.

Hint

---

*In order to call the **Text** dialogue, in which you can create a new text, click the* ![icon] *icon.*

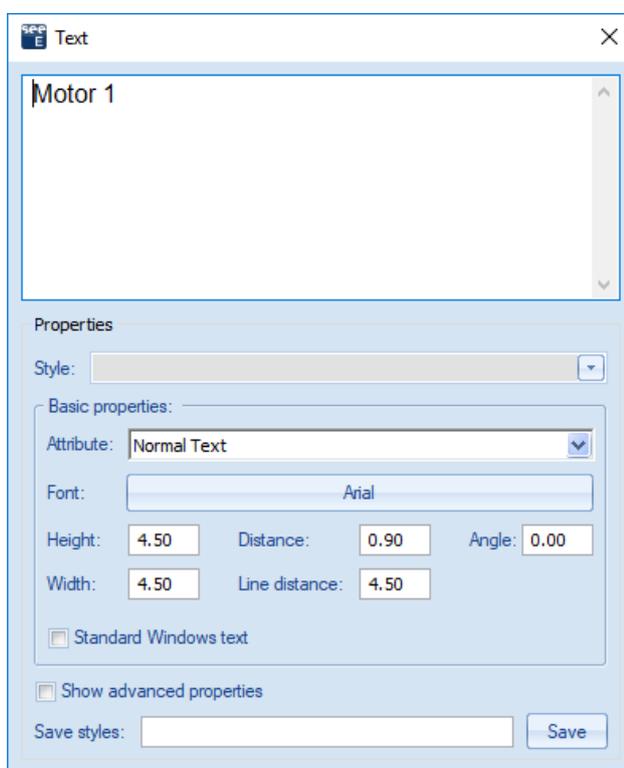| 3.+ | Move the cursor into the input field. |
| 4.# | Motor 1 |
| | Type in the text. |

| 5.> | Tick the *"Show advanced properties"* checkbox and select the desired text attributes, such as size, highlight colour and adjustment (Left justified, or Center justified). |

6.+   Insert the text in the drawing by clicking at the desired position.
                   The *Text* dialogue box remains open.

7.+   Move the cursor into the input field again.

8.   Change the existing text or type in a new text, place the text in the drawing, etc.

9.>   Click the ✕ button to close the *Text* dialogue box.

Now you will change the text you have just inserted.

1.CA   **Edit**

2.CO   **Edit Text** (**Text** panel)

3.+   Click the text you want to change.
                   The *Text* dialogue is displayed and you can see the text in the input field.

Hint

In order to call the *Text* dialogue, in which you can change/edit a text, you have to:

▪ *Click the ◀ icon.*
When you move the cursor to the drawing, its graphic changes.

▪ *Click the text to change.*
*The **Text** dialogue, which contains the respective text, is displayed.*

4.#   Type *"90.00"* degrees in the ***"Angle"*** field.

5.#   <Text>
                   Change the text "Motor 1" to "Motor FU3P1".
                   The change can be seen directly in the drawing.

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6.>   If you want, tick the **"Show advanced properties"** checkbox and change the desired text attributes, such as size, highlight colour and adjustment (Left justified, or Center justified).

7.+   Click the next text you want to change: "Motor 2" to "Motor FU3P2", for example. The **Text** dialogue box remains open.

8.+   Move the cursor into the input field again.

9.   Change the existing text, etc.

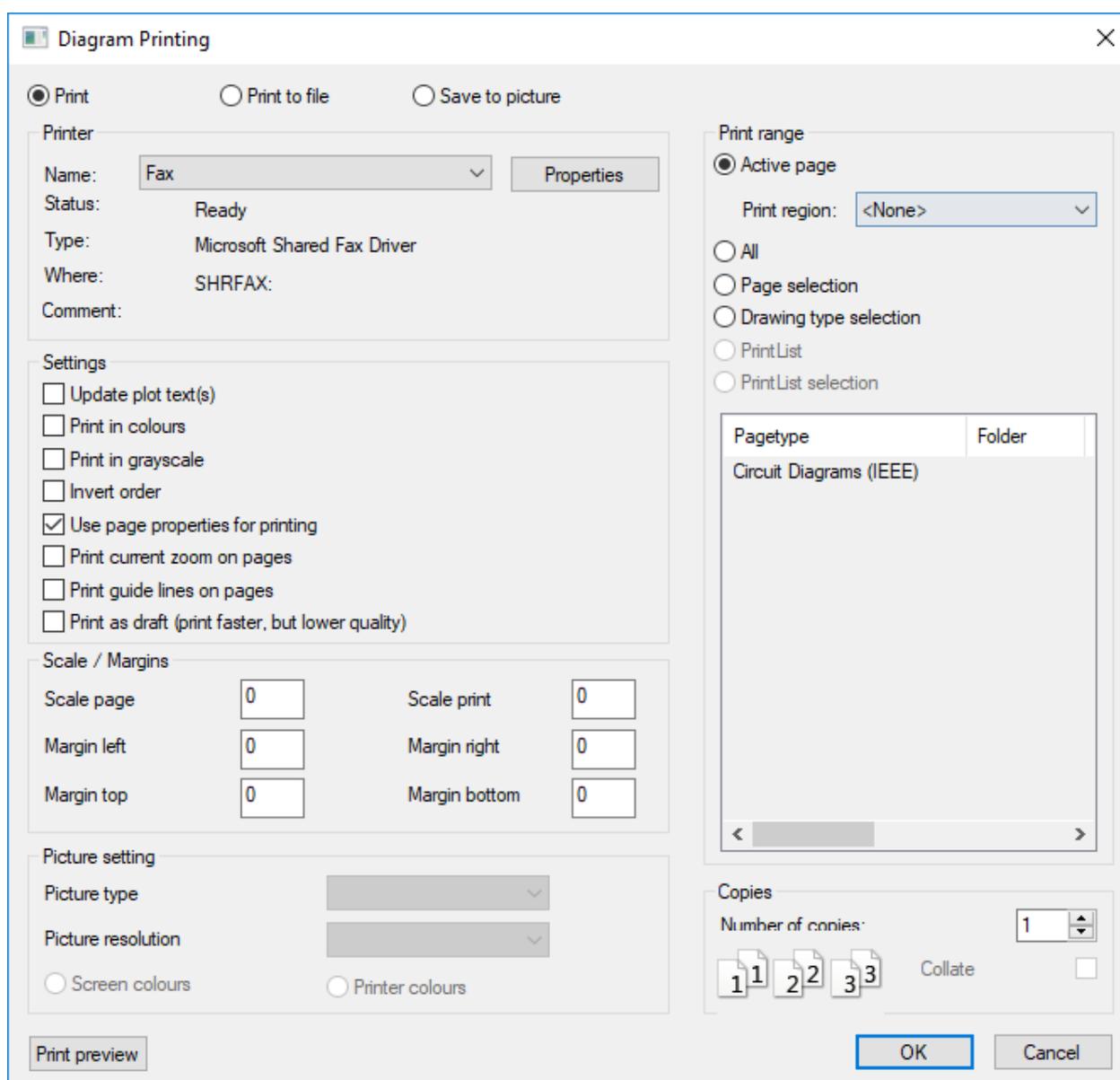10.>   Click the ✕ button to close the **Text** dialogue box.

E. Additional Processing of Circuit Diagrams
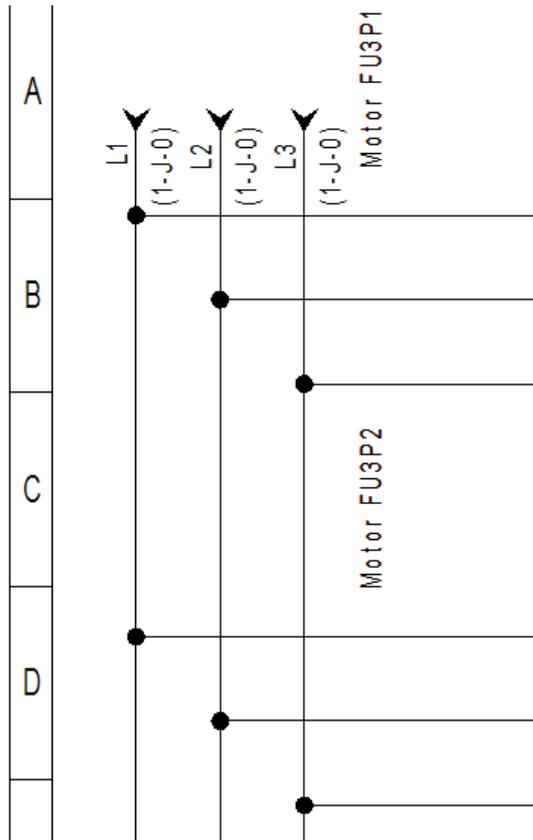
F   PRINTING

F.1. PRINT

After the project is completed, it can be printed.

1.CA   **File**
2.CO   **Print**
3.CO   **Print…**
         The **Diagram Printing** window is displayed.

The **"Use page properties for printing"** option allows you to print the pages in their current orientation - landscape (since the default orientation used by most printers is "portrait"). When enabled, the pages are printed in the orientation defined in the page template.
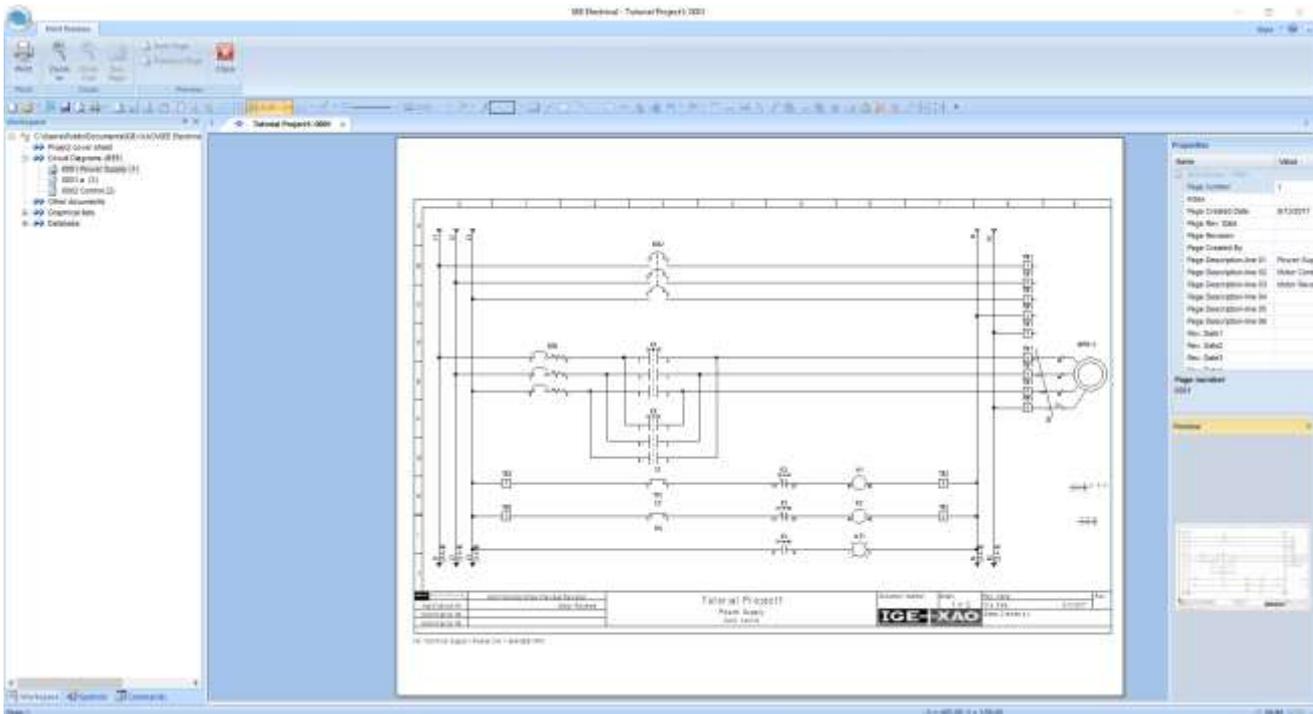
F.2. PRINT PREVIEW

A print preview is available for single pages of the project. This function can be accessed by clicking the **Print preview** button in the *Diagram Printing* window or by executing the **File ➤ Print ➤ Print Preview** command.

You will now display a print preview of the active page.

1.CA　　　**File**
2.CA　　　**Print**
3.CA　　　**Print Preview**
　　　　　A print preview of the currently active page appears.

4.>　　　Click the 🔍 icon to zoom the preview.
5.>　　　Click the **Close** button to exit the print preview.

G   CLOSING REMARKS

We hope you have found this tutorial useful and informative. You should now have a general understanding of the steps involved in producing electrical schematics with *SEE Electrical Free***.** The functions outlined here are only the tip of the iceberg in terms of what can be achieved using the packages sold by IGE+XAO. Other functionalities include:

- ✓ Creation of custom symbols with their associated electrical properties.
- ✓ Creation of customized page and workspace templates.
- ✓ Project development based on a Function/Location hierarchy, allowing multiple users to work on different parts of the same project, and then merge these together.
- ✓ Sophisticated handling of PLCs.
- ✓ Creation of dimensioned control cabinets with components linked to the main electrical schematic.
- ✓ Creation of building installation plans, with electrical components and cables linked back to the electrical schematic.
- ✓ Language translation of complete projects at the press of a button.
- ✓ Creation of customized graphical and database lists.
- ✓ Auto-diagramming function, allowing instant creation of circuit schematics directly from an *Excel* spreadsheet.
- ✓ And a lot more.

If you need help with any of the above, please contact our helpdesk.