

Getting Started Tutorial

see

electrical™

V6R1

Copyright IGE+XAO

Copyright

Copyright (c) November 2010 IGE-XAO. All rights reserved. No part of this manual, or any portion of it, shall be reproduced, transcribed, saved or translated, under whatever form and by whatever means, without written authorization from IGE-XAO, 25-27 bld Victor Hugo, Immeuble Pythagore 31773 COLOMIERS CEDEX FRANCE.

TABLE OF CONTENTS

GETTING STARTED TUTORIAL	1
A FOREWORD	5
B BEFORE YOU START	6
B.1. ABBREVIATIONS USED IN THIS TUTORIAL	6
B.2. FOLDERS AND FILES	7
C CREATING A WORKSPACE	8
C.1. CREATING A NEW WORKSPACE	8
D DRAWING CIRCUIT DIAGRAMS	13
D.1. DRAWING PAGE 1	13
D.1.1. Potentials on Page 1	13
D.1.2. Electrical Symbols on Page 1	14
D.1.3. Inserting a Protective Device on Page 1	16
D.1.4. Inserting a Circuit Breaker on Page 1	17
D.1.5. Inserting a Motor on Page 1	17
D.1.6. Inserting Type and Description	18
D.1.7. Inserting Main Contacts on Page 1	19
D.1.8. Inserting a Terminal Strip with 5 Terminals on Page 1	19
D.1.9. Inserting a Terminal Strip with 4 Terminals on Page 1	20
D.1.10. Connecting Symbols on Page 1	21
D.1.11. Inserting a Relay Coil on Page 1	23
D.1.12. Connecting the Relay Coil on Page 1	24
D.1.13. Inserting a Circuit Breaker in a Connection on Page 1	24
D.1.14. Inserting a Break Contact on Page 1	25
D.1.15. Copying a Path on Page 1	25
D.1.16. Inserting a Lamp on Page 1	27
D.1.17. Inserting a Relay Contact on Page 1	27
D.1.18. Inserting Terminals on Page 1	28
D.1.19. Drawing a Cable on Page 1	29
D.1.20. Page 1 Illustrated	31
D.2. DRAWING PAGE 2	32
D.2.1. Creating Page 2	32
D.2.2. Showing Two Pages Simultaneously	33
D.2.3. Copying Potentials	33
D.2.4. Restoring the Window of Page 2	34
D.2.5. Electrical Symbols on Page 2	34
D.2.6. Inserting Fuses on Page 2	35
D.2.7. Inserting a Contactor on Page 2	35
D.2.8. Inserting a Motor on Page 2	36
D.2.9. Connecting Symbols on Page 2	37
D.2.10. Inserting Terminal Strips on Page 2	39
D.2.11. Inserting Relay Coils on Page 2	41
D.2.12. Connecting the Relay Coil on Page 2	41
D.2.13. Inserting Circuit Breakers on Page 2	42
D.2.14. Inserting Contacts NC on Page 2	43
D.2.15. Inserting Contacts NO on Page 2	44

D.2.16.	<i>Drawing Wires on Page 2</i>	45
D.2.17.	<i>Drawing a Cable on Page 2</i>	48
D.2.18.	<i>Page 2 Illustrated</i>	50
E	ADDITIONAL PROCESSING OF CIRCUIT DIAGRAMS	51
E.1.	PAGE INDEX	51
E.2.	TEXTS	53
F	PRINTING	56
F.1.	PRINT	56
G	CLOSING REMARKS	58

Copyright IGE+XAO

A FOREWORD

This document is intended for anybody who is new to *SEE Electrical*. 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 touch-pad 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. It is 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 either downloaded the 30-day trial version of *SEE Electrical* from our website or have been sent the CD-ROM by post. It is also assumed that you have installed the software on your computer. If this is not the case then please do this before continuing. You should also ensure you have the latest update. This is achieved by running the 'Live Update' program from the package's relevant group in your start menu within Windows (ensure you are connected to the internet first).

If you require 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
#	Keyboard entry
>	Select a field in a window
<Input>	Type text or select element etc.
T	Click onto tab in window
I	Select icon within toolbars

B.2. FOLDERS AND FILES

SEE Electrical uses the following folders and files:

< SEE Electrical V6 folder >	The program files of <i>SEE Electrical</i> are saved in this folder.
...\PROJECTS	In this folder, you can find the workspace files of <i>SEE Electrical</i> delivered by default. Workspace files have the .SEP extension.
...\SYMBOLS	This folder contains the symbol databases in <i>SEE Electrical</i> . Symbol databases have the .SES extension. The TYPES.SES database, required in the <i>Standard</i> and <i>Advanced</i> levels is also stored here. Please note that the SYSTEM.SES library is required for internal purposes and must not be removed from this folder.
...\TEMPLATES	This folder contains workspace and page templates, templates for lists and labels, and Crystal Reports. Fonts are saved here, too. SEP: Workspace templates TDW: Page templates DAT: Fonts
...\TEMPLATES\LABEL_SETTINGS	SLS files (used for creating labels for different printer formats).

In addition, *SEE Electrical advanced* uses also:

...\SYMBOLS	In this folder, you can find Excel spreadsheets for the automatic generation of circuit diagrams.
...\TEMPLATES	In this folder, you can find the TRANSLATIONNEW.MDB translation database used by <i>SEE Electrical advanced</i> for translating the workspaces.

C CREATING A WORKSPACE

Important: Do not begin this stage until you have completed the instructions on the previous page!

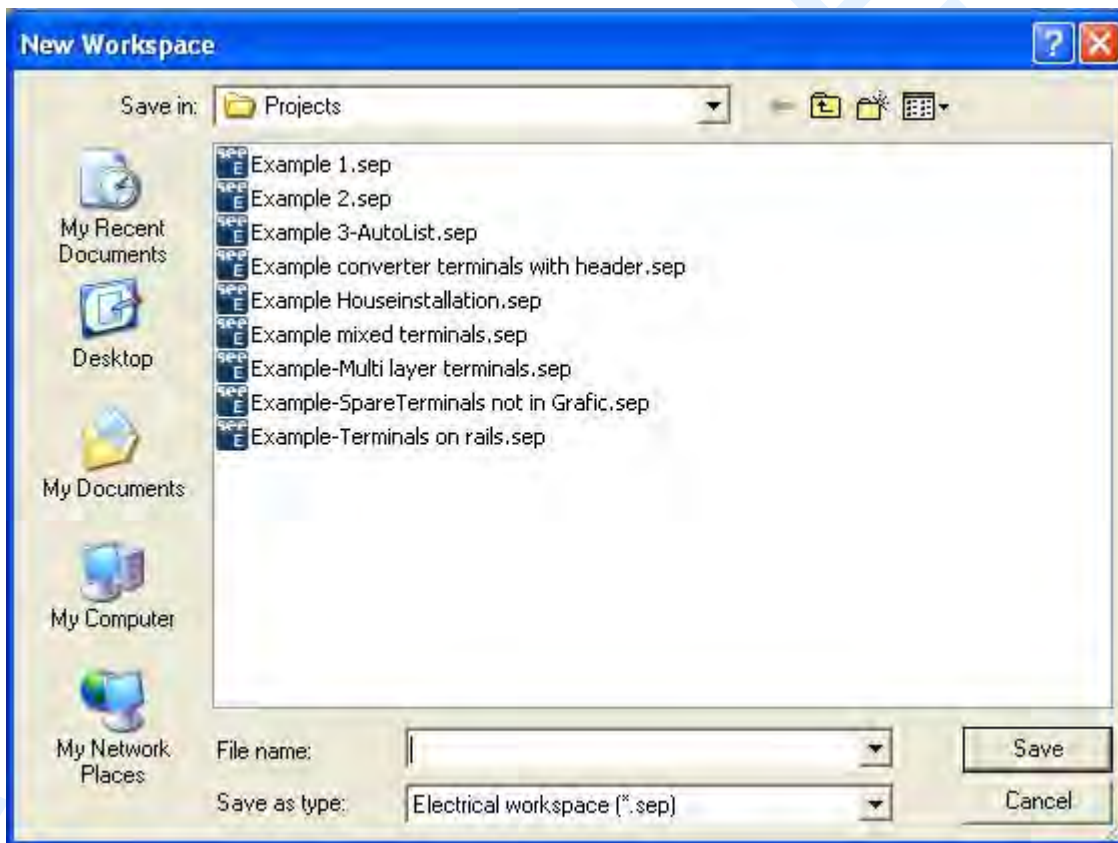
C.1. CREATING A NEW WORKSPACE

This chapter shows how to create a new workspace and then create two pages in it.

Quick guide:

- 1.CA **File**
- 2.CO **New**

The **New Workspace** dialogue box appears:

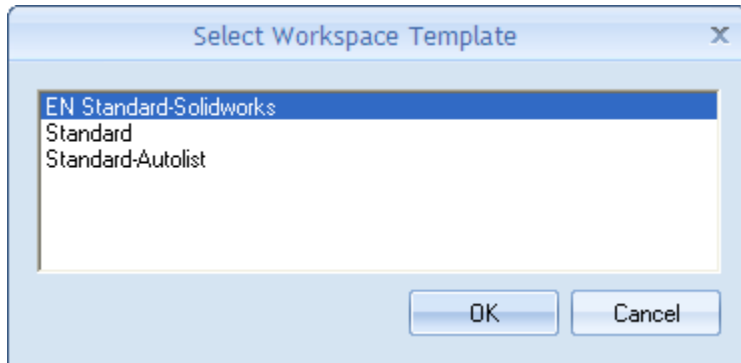


Note :

Various contents may appear within the dialogue.

- 3.> File name
- 4.# <Workspace name>
You can write a long descriptive name and use spaces.
- 5.> Save

A list of available workspace templates appears:



Note :

Various contents may appear within the dialogue.

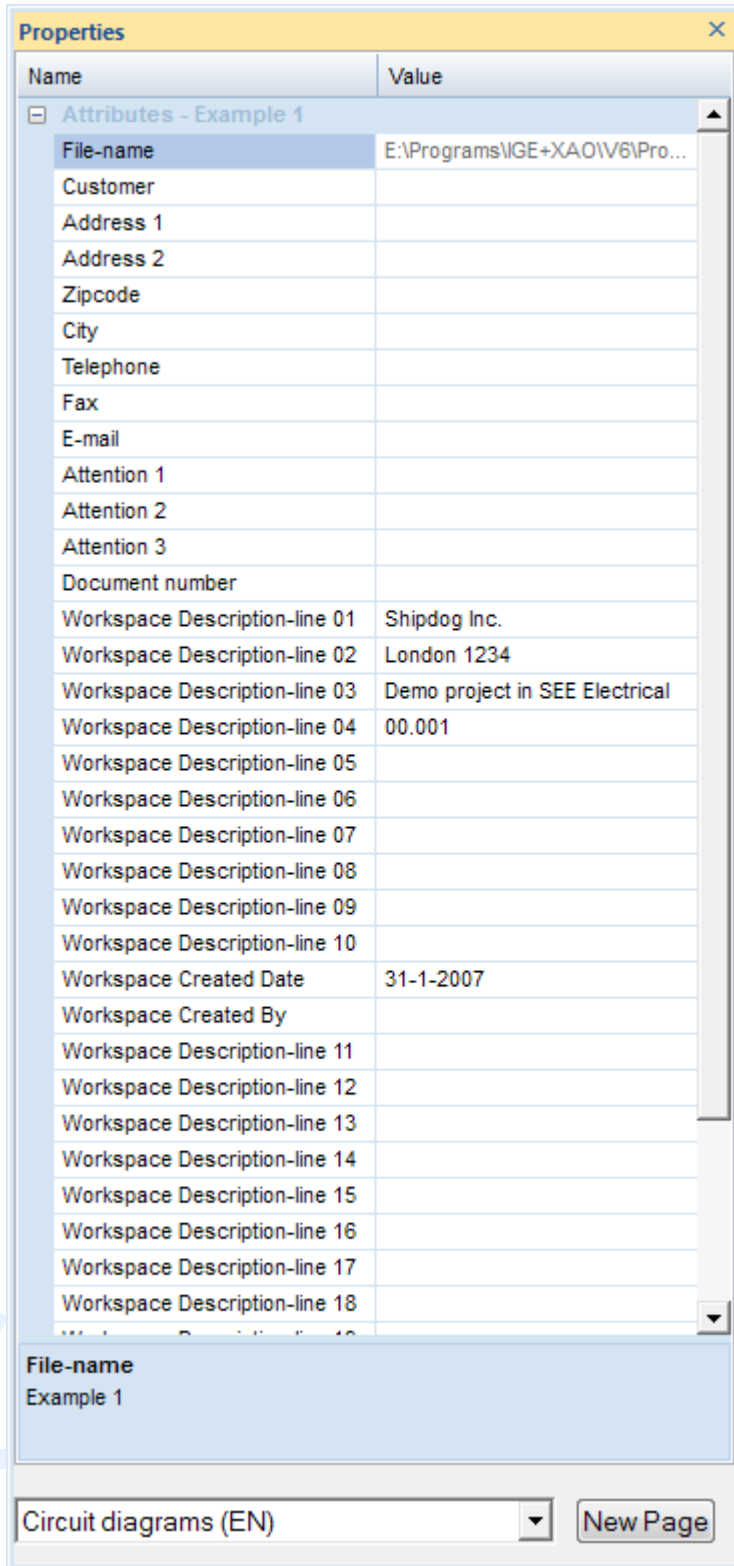
The "Standard" template is empty.

- 6.> Standard
- 7.> OK

Tutorial

COPYRIGHT © 2010 IGE+XAO. All rights reserved

The *Workspace Information* appears in the **Properties** pane in the left part of the main SEE Electrical window:



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...

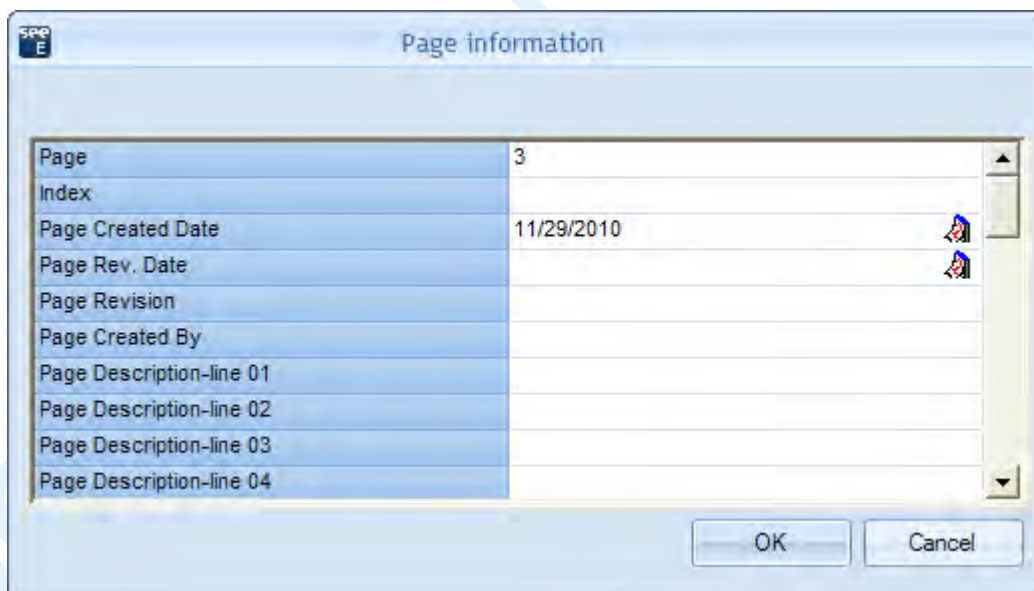
General Information about the workspace

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.
- 12.> New Page
- The Page information dialogue box appears:





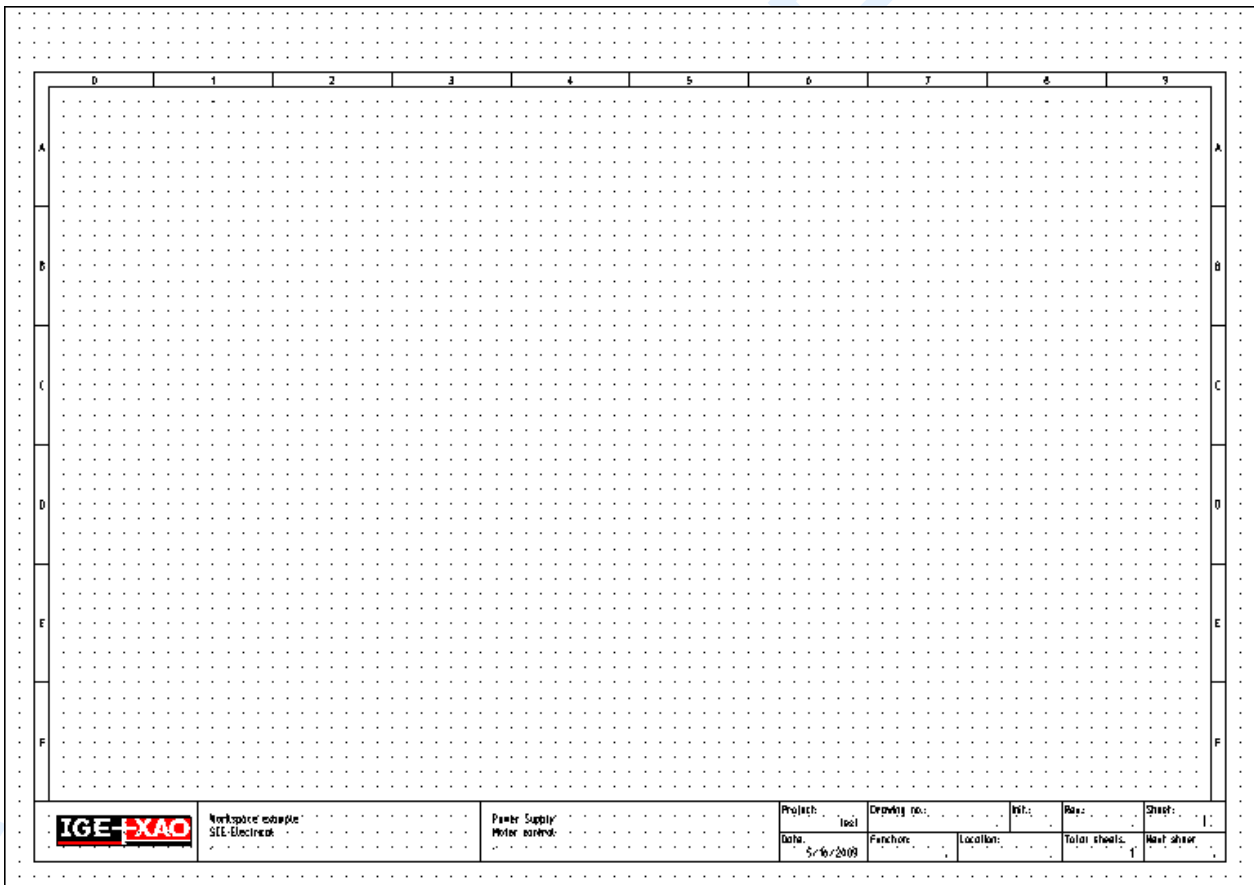
Type the following information in the dialogue box:

- 13.> Page
- 14.# 1
- The page number is automatically suggested by *SEE Electrical* but you can change it.

Tutorial

COPYRIGHT © 2010 IGE+XAO. All rights reserved

- 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" line, you can choose a date.
You can change the date by clicking the field  in the "Page Created Date" line. You can change the day, month, or year.
 - 23.> OK
- Page 1 is now displayed on the screen:



HINTS FOR CREATING A NEW PAGE

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 **Standard**. 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:

1CA. **Electrical**
2CO **Top (Potential panel)**

Click the command. The potential is drawn and a dialogue box appears. Type the name of the potential.

3.# L1
4.> OK
5CA. **Electrical**
6CO **Top)**
7.# L2
8.> OK
9CA **Electrical**
10CO **Top (Potential panel)**
11.# L3
12.> OK

HINT 1

You can choose the **Potential – Top** function by pressing F11 instead of clicking the  icon.

In the next steps, insert the two bottom potentials.


Quick guide:

1C . **Electrical**
2C **Bottom (Potential panel)**
3.# PE
4.> OK
5C . **Electrical**
6C **Bottom (Potential panel)**
7.# N
8.> OK

Tutorial

COPYRIGHT © 2010 IGE+XAO. All rights reserved

HINT 2

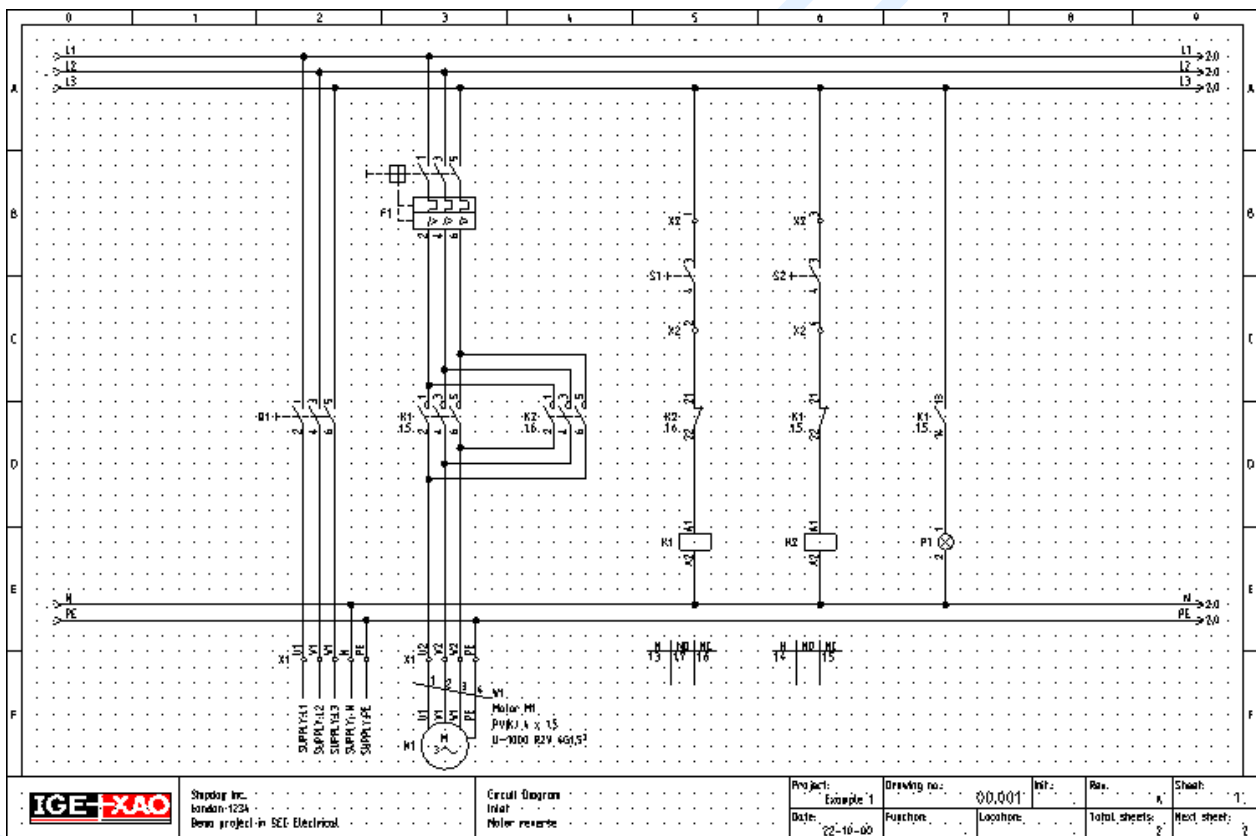
You can choose the **Potential – Bottom** function by pressing F11 instead of clicking the  icon.

HINT 3

According to IEC 61082-1, all wires must be continuous lines. This also applies for PE and N.

D.1.2. ELECTRICAL SYMBOLS ON PAGE 1

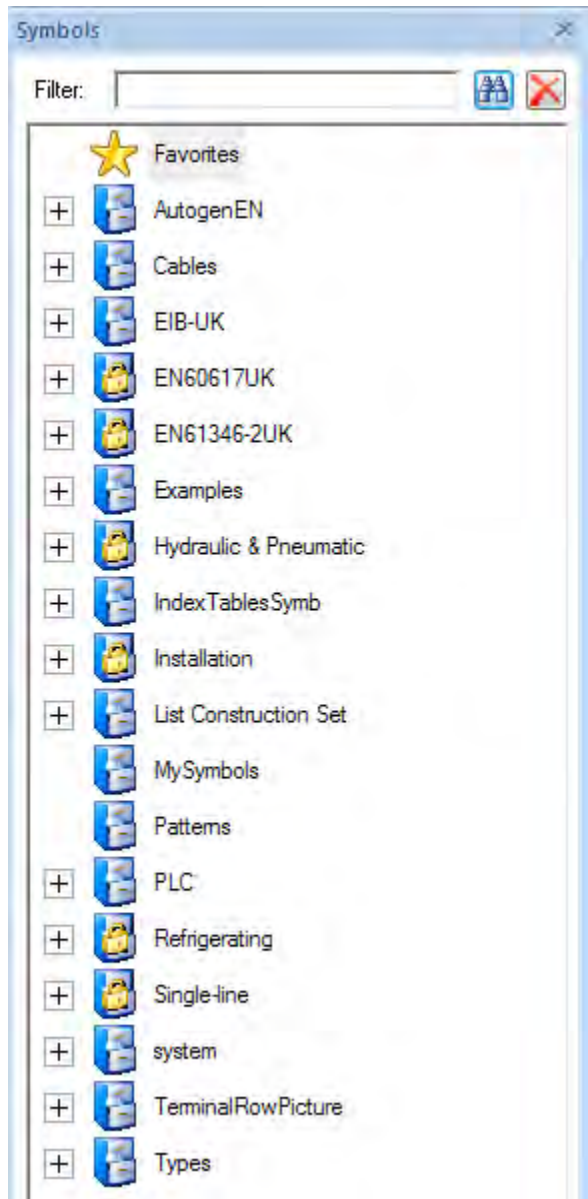
You will now insert electrical symbols in the circuit diagram.



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



The symbol tree appears:



Note :

Various contents may appear within the dialogue.

Selecting a Symbol Database

SEE Electrical symbols are distributed into symbol databases.

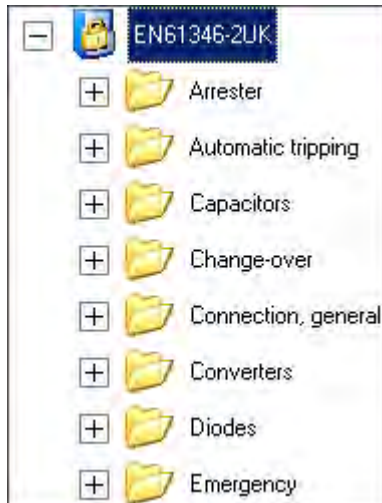
There exists a database of graphical symbols for diagrams according to IEC 60617, IEC 61082 and IEC 61346-2 (similar to EN 60617, EN 61082 and EN 61346-2). Other symbol databases include symbols for the layout of switch-boards from *Danfoss*, *Siemens*, etc.

- Select the database that contains the symbols you wish to work with. (In this case, select **EN61346-2UK**.)
- Double-click the **EN61346-2UK** 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.

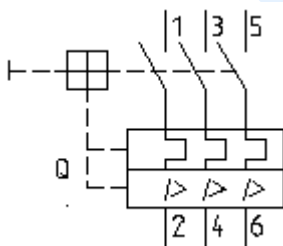
The symbol folders are arranged in alphabetical order:



- 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 path 3.

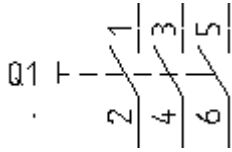


Quick guide:

1. Double-click the **Protective devices** symbol folder to open it.
- 2.+ Click the 3-pole trip breaker hand symbol.
Once you have selected the symbol, it appears attached to the cursor.
- 3.+ Move the cursor into the drawing area where you want to insert the symbol.
- 4.+ Click with the mouse to insert the symbol
5. The symbol name PAGE/CODE/PATH is automatically assigned.
6. Right-click to exit the insertion mode.

D.1.4. INSERTING A CIRCUIT BREAKER ON PAGE 1

You will now insert a **circuit breaker** in path 2.

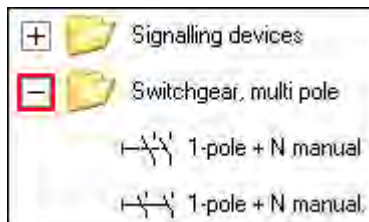


Quick guide:

1. Double-click the **Switchgear, multi pole** symbol folder to open it.
2. Click the **3-pole** 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.
5. Right-click to exit the insertion mode.

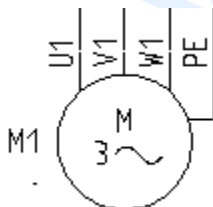
Hint

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



D.1.5. INSERTING A MOTOR ON PAGE 1

You will now insert a motor in path 3 below the bottom potentials.



Quick guide:

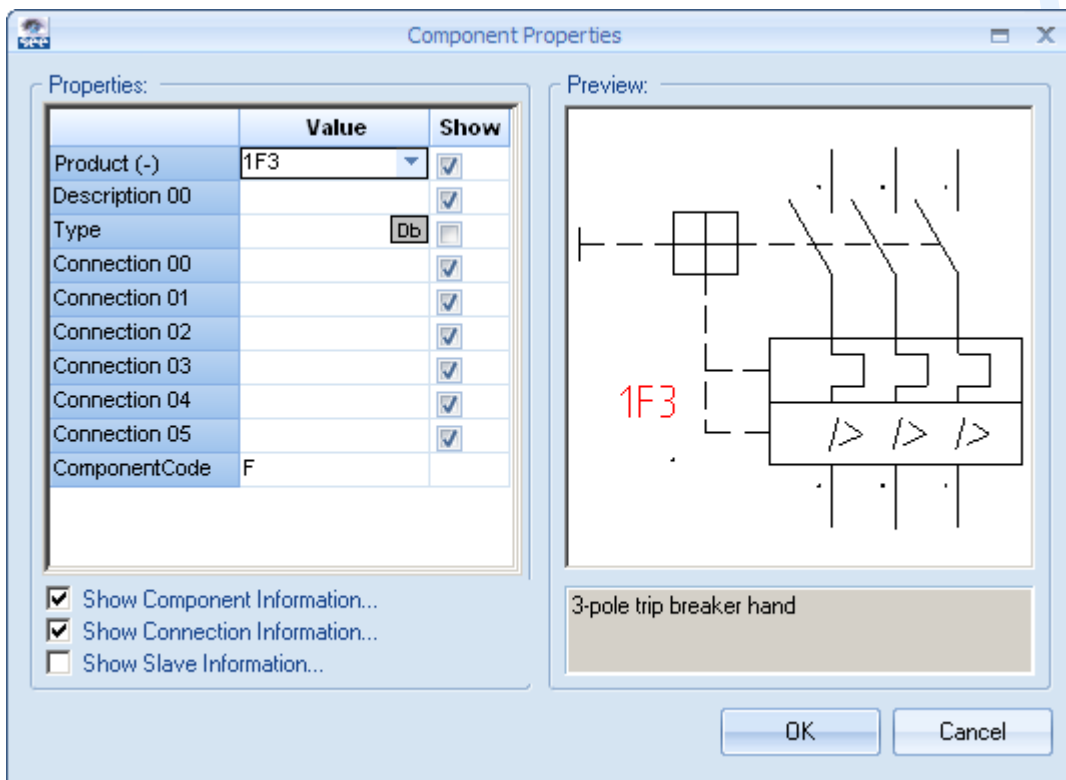
1. Open the **Motors and generators** symbol folder.
2. Select the **Three-phase + PE** symbol.
- 3.+ Move the cursor into the drawing area where you want to insert the symbol (the symbol is attached to the cursor).
- 4.+ Click to insert the symbol.
5. Right-click to exit the insertion mode.

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 **1F3** protective device symbol.
The symbol is highlighted red.
The following dialogue box appears:



- 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 lines. You can change them, if required.
Fill in 1, 2, 3, 4, 5 and 6, respectively.
- 6.> **OK**
Click **OK** to close the **Component Properties** dialogue.

Change also the types for 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 type in the Connections names for the motor in its **Component Properties** window: U1, V1, W1 and PE, respectively.

D.1.7. INSERTING MAIN CONTACTS ON PAGE 1

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

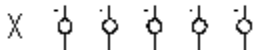


Quick guide:

1. Double-click the **Relay-contacts, MAIN** symbol folder to open it.
2. Select the **3-pole NO** contactor 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 with the mouse to insert the symbol.
The **Component Properties** dialogue box appears.
Change the name of the contact.
- 5.> Product (-)
- 6.# **1K5** (The coil will be placed on page 1 in path 5)
- 7.> OK
Insert the second main contact.
- 8.+ Click to insert the symbol contact in the desired place.
The **Component Properties** dialogue box appears again.
- 9.> Product (-)
- 10.# **1K6** (The coil will be placed on page 1 in path 6.)
- 11.> 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 a terminal strip with 5 terminals in path 2 beneath the existing bottom potentials.



Quick guide:

1. Open the **Terminals** symbol folder.
2. Select the 5 terminals 90°, vertical 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.
The **Component Properties** dialogue box appears (first terminal), change as described:
- 5.> Product (-)
- 6.# X1
- 7.> Terminal Number
- 8.# **1** (first terminal number available in the terminal strip)

- 9.> Terminal Index
Using the terminal index, you can manage the sorting of the terminals in the list of terminals. In particular, it is important to use the terminal index, if terminals PE or N must be inserted in the right place in the list of terminals. For example, the terminals 1, 2, 3 and PE and 4, 5, 6 and PE are available, the terminal with the number 4 would receive the terminal index 5, as it must be inserted behind the first PE terminal in the position 5 in the terminals list.
- 10.# 1
If you wish to insert a type, this can be done here, in the *Type* field.
- 11.> OK
Right-click to exit the insertion mode.

The names X1:2, X1:3, X1:4 and X1:5 are assigned automatically to the next four terminals.

D.1.9. INSERTING A TERMINAL STRIP WITH 4 TERMINALS ON PAGE 1

You will now insert a **terminal strip with 4 terminals** in path 3 beneath the bottom potentials.



Quick guide:

1. The **Terminals** symbol folder is open.
2. Select the 4 terminals 90°, vertical 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.
The **Component properties** dialogue box appears (first terminal), change as described:
- 5.> Product (-)
- 6.# X1
A name for the terminal is suggested. Accept it.
- 7.> Terminal Number
- 8.# 6
The terminal number 6 is suggested. Accept it.
- 9.> Terminal Index
- 10.# 6
The terminal index 6 is suggested. Accept it.
- 11.> OK
Right-click to exit the insertion mode.

The names X1:7, X1:8 and X1:9 are assigned automatically to the next three terminals.

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 X1:1, X1:2 and X1:3.

Quick guide:

- 1CA **Electrical**
- 2CO **3 wires (Wire Connections panel)**
- 3.+ Select the starting point for the wire on the potential L1 strictly vertically above the connections of the terminal X1:1 by clicking the left mouse button.
- 4.+ Select the second point for the wire on the top connection of the terminal X1:1 by clicking the left mouse button again.

In addition to the connection between L1 and X1:1, *SEE Electrical* draws automatically two more connections: between the potential L2 and the terminal X1:2, and between the potential L3 and the terminal X1:3.

The connections are automatically broken at the symbol's places (for example at the main circuit breaker).

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

Quick guide:

- 1. The **Draw 3 wires** command is still active. Keep on drawing.
- 2.+ Select the starting point for the wire on the potential L1 strictly vertically above the connection of the motor U1 by clicking the left mouse button again.
- 3.+ Select the second point for the wire on the connection U1 of the motor by clicking the left mouse button.

Now you will connect the terminal X1:4 with the potential N, and the terminal X1:5 as well as the motor connection 1M3/PE with the potential PE.

Quick guide:

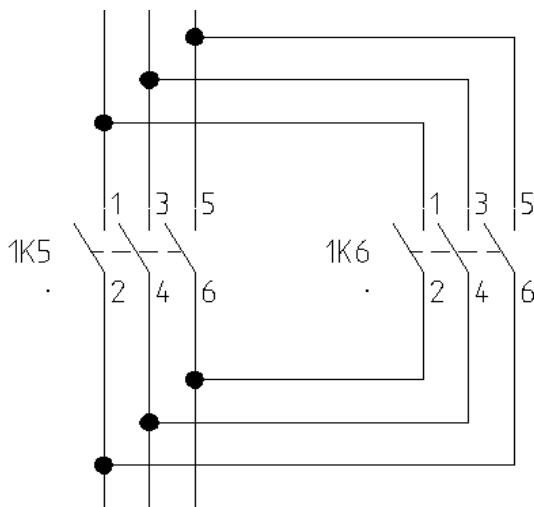
- 1CA **Electrical**
- 2CO **3 wires (Wire Connections panel)**
- 3.+ Select the starting point for the wire on the potential N strictly vertically above the terminal X1:4 by clicking the left mouse button.
- 4.+ Select the second point for the wire on the top connection of the terminal X1:4 by clicking the left mouse button again.
- 5. The **Draw 1 wire** command is still active. Now, draw the wire between the potential PE and the top connection of the terminal X1:5, as described above.

6. The **Draw 1 wire** command is still active. Draw the wire between the potential PE and the motor connection U1.
Right-click to exit the wire drawing mode.

HINT

You can select the **Draw 3 wires** function by pressing the **CTRL + 3** key combination, and you can activate the **Draw 1 wire** function by pressing the **CTRL + 1** key combination.

Wires for reversal of rotation direction



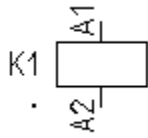
You will now draw connections from the vertical wires in path 3, through the three-pole circuit breaker in path 4, and back to the vertical wires in path 3.

Quick guide:

- | | |
|-----|---|
| 1CA | Electrical |
| 2CO | Orthogonal Wiring (Wire Connections panel) |
| 3.+ | Select the starting point for the wire on the top of the vertical wire above 1K5/5. |
| 4.+ | Place the first corner point of the wire horizontally on the right of the just now placed starting point and above the connection 1K6/1 of the main relay-contact.
The node at the intersection point with the existing vertical connection is created automatically |
| 5.+ | Place the second corner point of the wire vertically below the connection 1K6/6 and at the height where the wire must lead to the vertical connection. |
| 6.+ | Place the ending point of the wire at the vertical connection below 1K5/2.
The node at the intersection point with the existing vertical connection is created automatically.
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 path 5 on page 1.



Quick guide:

1. Open the **Relay coils** symbol folder.
2. Select the **1-pole** 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 symbols.
A contact cross appears automatically beneath the symbol. Data about existing contacts appear directly. The main relay-contact reference appears here. If you assign additional contacts to the relay coil later, the corresponding references appear automatically in the contact cross.
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 appears.
- 2.> Type
- 3.# 3TB4011
This is an example of a type.
- 4.> OK

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 **1K5** with the potentials **L3** and **N**.

Quick guide:

- 1CA **Electrical**
- 2CO **1 wire (Wire Connections panel)**
- 3.+ Select the starting point for the wire on the potential L3 strictly vertically above the relay coil 1K5.
- 4.+ Select the second point for the wire vertically beneath the relay coil on the 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.

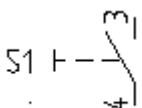
D.1.13. INSERTING A CIRCUIT BREAKER IN A CONNECTION ON PAGE 1

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 **circuit breaker** in path 5 on the existing connection.



Quick guide:

- 1. Open the **Switchgear, one-pole** symbol folder.
- 2. Select the **NO general** symbol
- 3.+ Select the place where you want to insert the switch (the symbol is attached to the cursor).
- 4.+ Click the left mouse button to insert the symbol.
Right-click to exit the wire insertion mode.

Changing the type of the circuit breaker:

Quick guide:

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

D.1.14. INSERTING A BREAK CONTACT ON PAGE 1

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



Quick guide:

1. Open the **Relay contacts, NC** symbol folder.
2. Select the **1-pole, 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
SEE Electrical opens automatically the **Component Properties** dialogue box
Assign the contact to the relay coil.
- 5.> Product (-)
- 6.# 1K6
- 7.> Connection Text 00
- 8.# 21
Enter the contact number of the connection.
- 9.> Connection Text 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 PATH ON PAGE 1

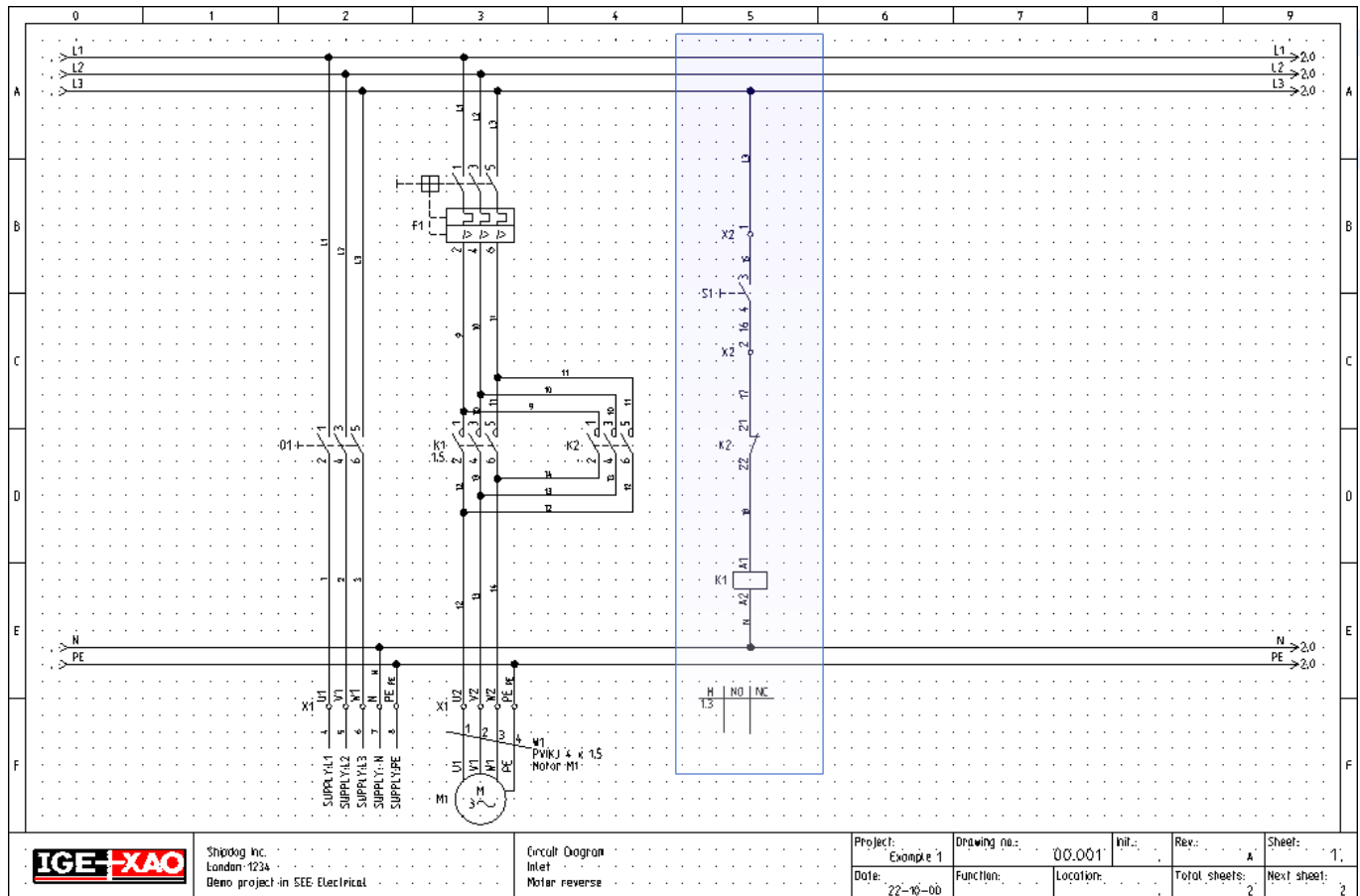
You have now drawn all the elements in path 5.

Path 6 will be exactly like path 5, but the component names of the symbols will be changed. Therefore, it is easier to copy everything from path 5 to path 6.

There are several ways of copying but the easiest one is described below.

Quick guide:

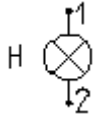
You must select all the symbols in path 5 within a frame as shown below:



- 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 path 5 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 red.
 5. Move the cursor near to the top node. Click the left mouse button and hold it pressed while moving the mouse. The selected symbols and wires are attached to the cursor. The point attached to the cursor is the point where the cursor has been placed at the beginning of this step.
 - 6.+ Move the group to the position where you want to insert it (path 6). Press and hold the CTRL key (*Windows* standard procedure: Copy while moving) before releasing the left mouse button to place it. The group is copied to path 6.
 7. *SEE Electrical* automatically changes the names of the symbols just copied. However, you must rename the break contact in path 6 to "1K5". The dialogue box for the break contact appears. Assign a name to the contact in path 6.
 - 8.> Product (-)
 - 9.# 1K5
 - 10.> **OK**
- The cross-references in the contact cross of the relay coil are automatically updated. Path 6 is now an exact copy of path 5.

D.1.16. INSERTING A LAMP ON PAGE 1

You will now insert a **lamp** in path 7.



Quick guide:

1. Open the **Lamps** symbol folder.
2. Select the **Lamp** 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.
Right-click to exit the insertion mode.

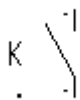
Changing the type of the lamp:

Quick guide:

- 1.+ Double-click the lamp.
The symbol is highlighted in red. The **Component Properties** dialogue box appears.
- 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 path 7.



Quick guide:

1. Double-click the **Relay contacts, NO** symbol folder.
2. Select the **1-pole, 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.
5. In the dialogue box, assign the contact to the appropriate relay coil
- 6.> Product (-)
- 7.# 1K6
This symbol is only applied when associated with a relay coil. You must insert manually the numbers for the connection text. For example:

- 8.> Connection text 00
- 9.# 13
Type in the contact number of the first connection.
- 10.> Connection text 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 path 7

Now you will connect the potentials L3 and N together in path 7.

Quick guide:

- 1CA **Electrical**
- 2CO **1 wire (Wire Connections panel)**
- 3.+ Select the starting point for the wire on the potential L3 strictly vertically above the lamp 1H7.
- 4.+ Select the second point for the wire on the potential N, vertically beneath the first point.
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 4 **terminals** in path 5 and 6.



Quick guide:

- 1. Open the **Terminals** symbol folder.
- 2. Select the 1 terminal 90°, vertical symbol.
- 3.+ Select the place where you want to insert the terminal X2:1 (at the top of path 5, the symbol is attached to the cursor).
- 4.+ Click the left mouse button to insert the symbol
The **Component Properties** dialogue box appears.
Type in the following data:
- 5.> Product (-)
- 6.# X2
- 7.> Terminal Number
- 8.# 1 (the first number available in the terminal strip)
- 9.> Terminal Index
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.+ Select the place where you want to insert the terminal X2:2 (at the bottom of path 5, the symbol is attached to the cursor).
- 13.+ Click the left mouse button to insert the symbol.
You can enter a type in the **Type** field.
- 14.> OK
The dialogue box for the terminal appears. *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 path 5.
- 2.# Press the CTRL key and hold it down (*Windows* standard procedure: Add to selection).
- 3.+ Select the bottom terminal in path 5.
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 (and wires) are attached to the cursor. The point attached to the cursor is the point where the cursor has been placed at the beginning of this step.
- 5.# Press now and hold down the CTRL key (*Windows* standard procedure: Copy using Drag and Drop)

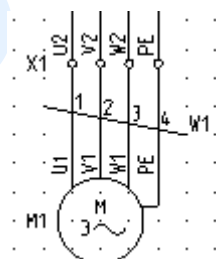
- 6.+ Drag the symbols to the desired position (path 6), and drop them by clicking the left mouse button.
- 7.> **OK**

The name of the first terminal is asked in the dialogue box. Fill in the terminal number 3 (terminal strip X2) and terminal index 3.

The values of the second copied terminal are changed automatically, but in the *basic* level, you have to change them manually.

D.1.19. DRAWING A CABLE ON PAGE 1

You will now insert a **cable** between terminal strip X1 and motor 1M3:



Quick guide:

- 1CA **Electrical**
- 2CO **Cable (Cable panel)**
- Cables must run across wires, but not across elements of symbols.
- 2.+ Select the starting point of the cable.
- 3.+ Select the ending point of the cable.
- The **Component Properties** dialogue for the cable appears. It allows you to fill in the information for all cable cores.
- Type in the desired information for the cable:
- 4.> Product (-)
- 5.# W1
- 6.> Type
- 7.# U-1000 R2V 4G1,5²
- 8.> Cable-core No.
- 9.# 1
- The cores are numbered in succession, from left to right, starting with 1 for each new cable.
- 10.# Cable core Colour
- In case a valid type has been selected, the cable core colours are filled in, according to the information from the *Type Database*.
- 11.# 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*.
- 12.> **OK**
- Right-click to exit the cable insertion mode.

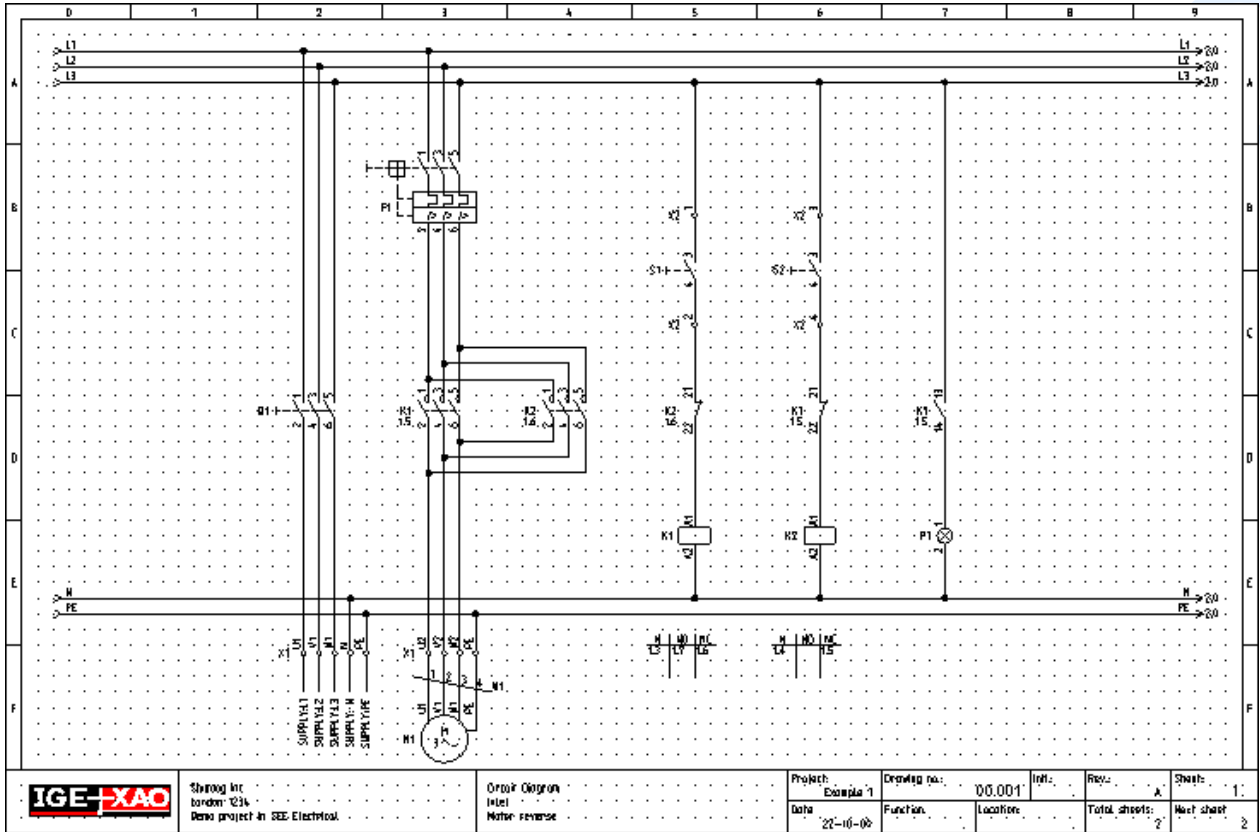
HINTS

According to EN 61346-2 table 1, 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 **Cable Setup** button in the **Cables** tab of the **Circuit Diagrams Properties** window, the **Electrical > 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

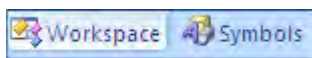
This chapter guides you, step by step, how to draw the circuit diagram on page 2.

D.2.1. CREATING PAGE 2

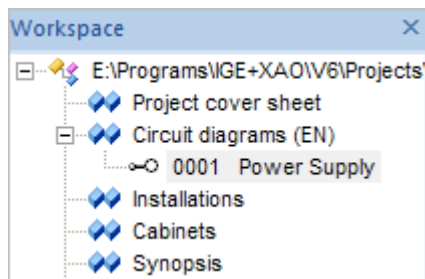
You will now create the second page in the workspace.

Quick guide:

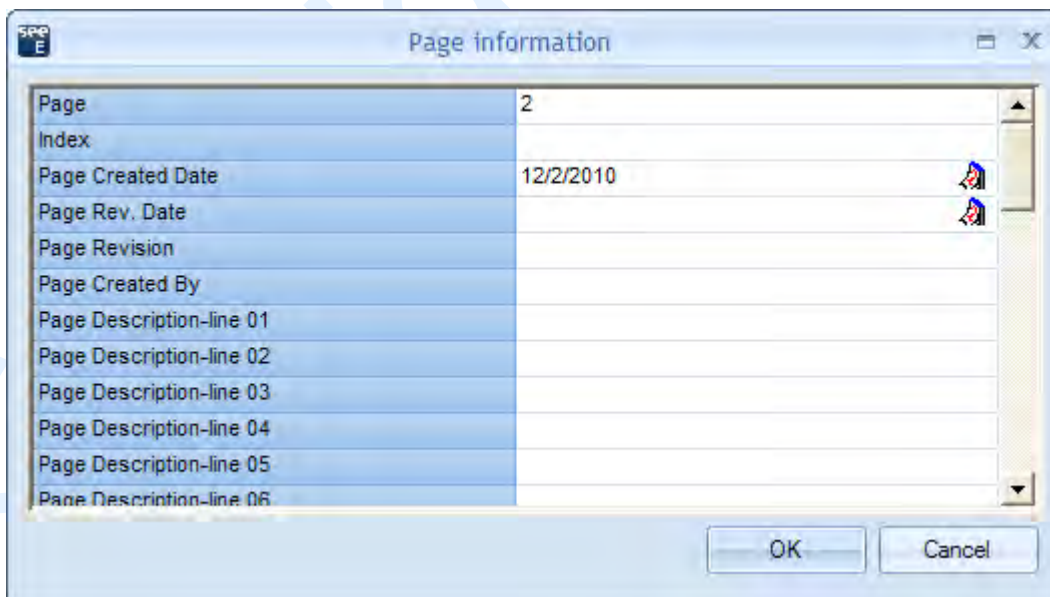
1. Select the **Workspace** tab as shown below:



The **Workspace Explorer** appears:



2. Right-click the **Circuit diagrams (EN)** module in the Workspace Explorer and select the **New** pop-up command
The **Page information** dialogue box appears:



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
- 7.> OK
Page 2 appears on the screen.

HINT

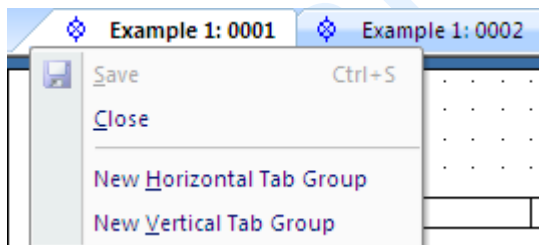
You can switch between pages 1 and 2 by using the **PageUp** and **PageDown** keys.

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 shown 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 top 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**

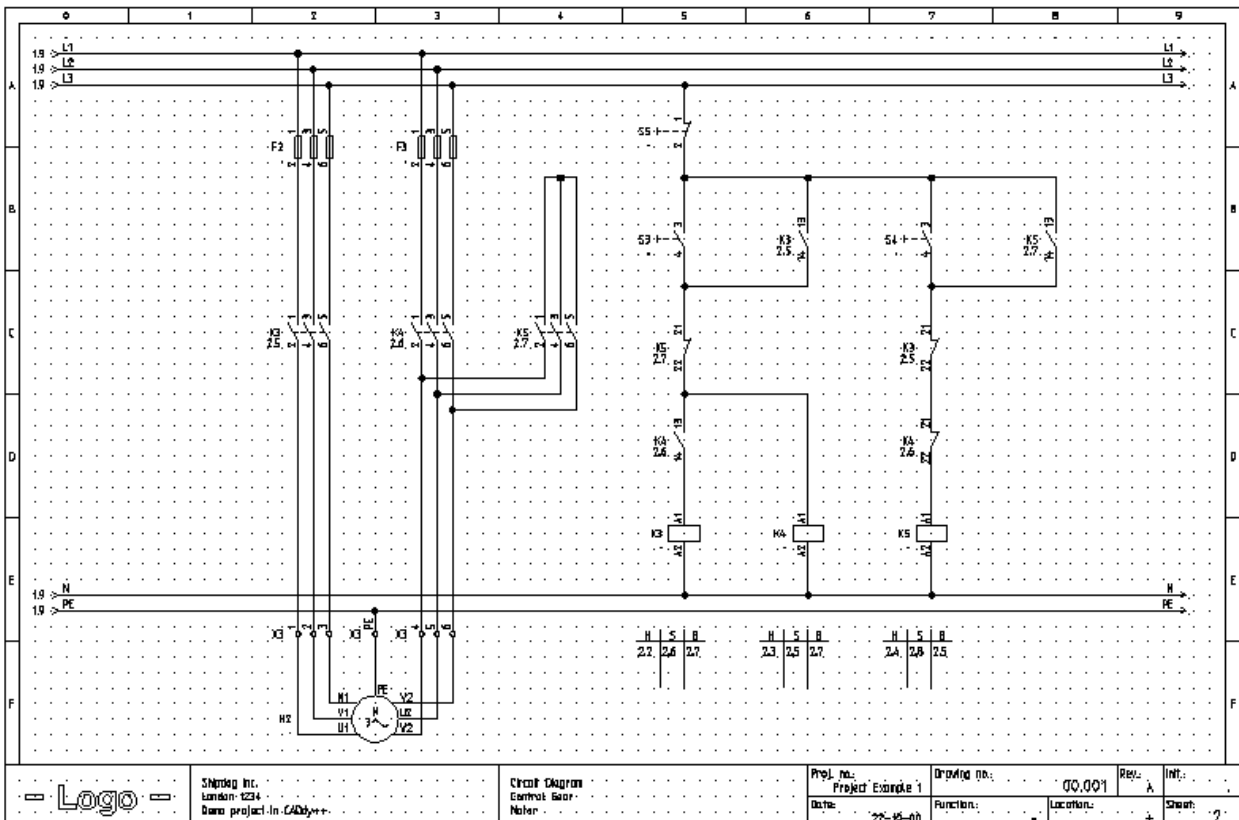
SEE Electrical asks for the names of the five potentials in succession. You can change the names but do not do it now. Accept the suggested names by clicking **OK**. The potentials on page 1 receive on their right side automatically an additional cross-reference to the potentials on page 2. The potentials on page 2 receive on their left 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 first page (Page 001).
- 2. Select the Move to Previous 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:

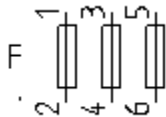
1. Select Symbols as shown below:



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 path 2 and 3.

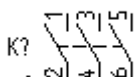


Quick guide:

1. Open the **Fuses** symbol folder.
2. Select the **3-pole fuse** symbol.
- 3.+ Select the place where you want to insert fuse 1 (path 2). 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 (path 3), 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.
Change the fuse type in the same way as described above.
- 8.+ Double-click the fuse.
The symbol is highlighted in red. The **Component Properties** dialogue box appears.
- 9.> Type
- 10.# E3
This is an example of a type.
- 11.> **OK**
Use the same approach for the second fuse.

D.2.7. INSERTING A CONTACTOR ON PAGE 2

You will now insert **contactors** in paths 2, 3 and 4.

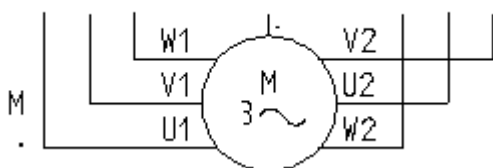


Quick guide:

1. Open the **Relay-contacts, MAIN** symbol folder.
2. Select the **3-pole NO** symbol.
- 3.+ Select the place where you want to insert the first contactor (path 2). The symbol is attached to the cursor.
- 4.+ Click the left mouse button to insert the symbol in the page.
The **Component Properties** dialogue box appears.
Change the component name.
- 5.> Product (-)
- 6.# 2K5 (the relay coil will be placed on page 2 in path 5).
- 7.> **OK**
Now place the second contactor.
- 8.+ Select the place where you want to insert the contactor (path 3). The symbol is still attached to the cursor.
- 9.+ Click the left mouse button to insert the symbol in the page.
The **Component Properties** dialogue box appears again.
- 10.> Product (-)
- 11.# 2K6 (the relay coil will be placed on page 2 in path 6).
- 12.> **OK**
- 13.+ Select the place where you want to insert contactor 3 (path 4). The symbol is attached to the cursor.
- 14.+ Click the left mouse button to insert the symbol on the page.
The **Component Properties** dialogue box appears again (for the third contactor).
- 15.> Product (-)
- 16.# 2K7 (the relay coil will be placed on page 2 in path 7).
- 17.> **OK**
Right-click to exit the insertion mode.

D.2.8. INSERTING A MOTOR ON PAGE 2

You will now insert a **motor** in path 3, beneath the bottom potentials.



Quick guide:

1. Open the **Motors and generators** symbol folder.
2. Select the **Three-phase, Y/D** symbol.
- 3.+ Select the place where you want to insert the motor (path 2). 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.
Change the motor type as described below:
- 6.+ Double-click the motor.
The symbol is highlighted in red. The **Component Properties** dialogue box appears.

- 7.> Type
- 8.# M30
This is an example of a type.
- 9.> Connection 03
- 10.> PE
Type in the text **PE** for Connection 03. The other connection texts are filled in automatically. Please do not change them.
- 11.> **OK**

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 U1, V1 and W1.

Quick guide:

- 1CA **Electrical**
- 2CO **3 wires (Wire Connections** panel)
- 3.+ Select the starting point for the wires on potential L1, strictly vertically above the connection U1 of the motor.
- 4.+ Select the second point for the wires on the connection U1 of the motor.
Two additional wires are now drawn automatically: from potential L2 to connection V1 and from potential L3 to connection W1.
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 connection between the potentials L1, L2 and L3 and the connections W2, V2 and U2 of the motor.

Quick guide:

- 1. The **Draw 3 wires** command is still active. Draw the next connection.
- 2.+ Select the starting point for the wires on potential L1, strictly vertically above the connection W2 of the motor.

- 3.+ Select the second point for the wires on the connection W2 of the motor
Right-click to exit the wire drawing mode.

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

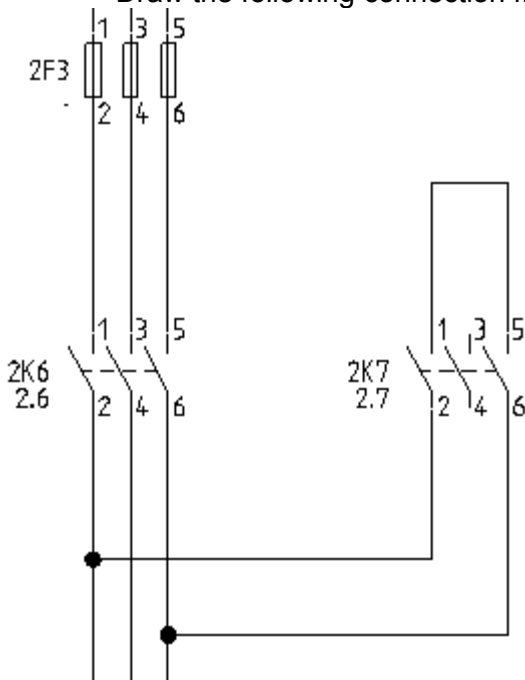
Quick guide:

- 1CA **Electrical**
- 2CO **1 wire (Wire Connections panel)**
- 3.+ Select the starting point for the wire on the potential PE exact vertical above the connection 2M2/PE (the middle connection of the motor).
- 4.+ Select the second point for the wires 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 2K7.

Quick guide:

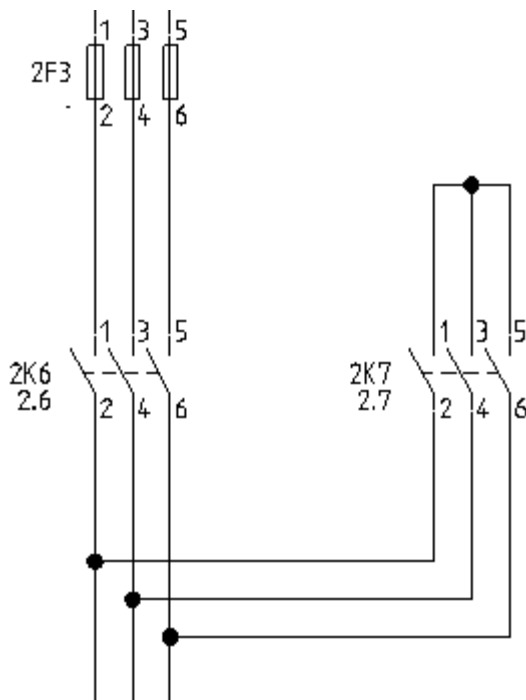
1. Draw the following connection first:



- 2.+ Select the starting point for the wire on the vertical wire beneath the connection 2K6/2.
- 3.+ Select the first corner point of the wire horizontally rightwards to the selected starting point and beneath the connection of the main contact 2K7/2.
The node at the intersection point with the vertical connection appears automatically.
- 4.+ Select the second corner point of the wire vertically above the corner point that you just placed and at the height where the wire must go on horizontally.
- 5.+ Place the ending point of the vertical part of the wire.
- 6.+ Draw the wire vertically downwards. Place the next corner point beneath the connection 2K7/6 at the height where you want to go back to the vertical connection between 2K6/6 and 2M2/V2

- 7.+ Draw now the horizontal connection. Place the end point of the new connection beneath the connection 2K6/6 at the existing vertical connection.
The node at the intersection point with the vertical connection appears automatically.

Now draw the missing connection to 2K7.



Quick guide:

- 1.+ Select the starting point for the wire at the vertical wire beneath the connection 2K6/4.
- 2.+ Select the first corner point of the wire horizontally rightwards to the just now selected starting point and beneath the connection 4 of the main contact 2K7.
The node at the intersection point with the vertical connection appears automatically.
- 3.+ Place the end point of the new connection vertically above the selected corner point and at the existing horizontal connection.
Right-click to exit the wire drawing mode.

D.2.10. INSERTING TERMINAL STRIPS ON PAGE 2

You will not insert a **terminal strip** with 3 terminals in path 2 and 3.



Quick guide:

1. Double-click the **Terminals** symbol folder.
2. Click the 3 terminals 90°, vertical 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 (above the connection U1 of the motor).
The **Component Properties** dialogue box appears.
Change the information in it, as described:
- 5.> Product (-)
- 6.# X3
- 7.> Terminal Number
8. 1
- 9.> Terminal Index
- 10.# 1
If you wish to insert a type, type it in the *Type* field.
- 11.> **OK**
The names X3:2 and X3:3 for the next terminals are assigned automatically.
Now place the terminals for the motor connections U2, V2 and W2.
- 12.+ Move the cursor into the drawing area. The component is attached to the cursor.
- 13.+ Click the left mouse button to insert the symbol in the desired place (above the connection W2 of the motor).
The **Component Properties** dialogue box appears. Change the information in it, as described:
- 14.> Product (-)
- 15.# X3
The name is suggested automatically by *SEE Electrical*. Accept it.
- 16.> Terminal Number
- 17.# 4
- 18.> Terminal Index
- 19.# 4
If you wish to insert a type, type it in the *Type* field.
- 20.> **OK**
The names X3:5 and X3:6 for the next terminals are assigned automatically.
Right-click to exit the inserting mode.

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

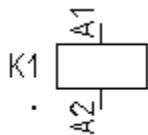

Quick guide:

1. Double-click the **Terminals** symbol folder.
2. Select the 1 terminal 90°, vertical symbol.
- 3.+ Select the place where you want to insert the terminal. The symbol is attached to the cursor.
- 4.+ Click the left mouse button to insert the symbol in the desired place (at the bottom of path 2).
The **Component Properties** dialogue box appears.
SEE Electrical automatically increases the terminal number and terminal index with +1. However, you must change the terminal number to **PE**.
- 5.> Product (-)
- 6.# X3

- 7.> Terminal Number
- 8.# PE
- 9.> Terminal Index
- 10.# 7
- 11.> **OK**
Terminal strip X3 is numerated as follows: X3: 1-2-3--4-5-6-PE.

D.2.11. INSERTING RELAY COILS ON PAGE 2

You will now insert a **relay coil** in path 5, 6, and 7.



Quick guide:

1. Double-click the **Relay coils** symbol folder to open it.
2. Click the **1-pole** symbol
- 3.+ Select the place where you want to insert the first relay coil (path 5). The symbol is attached to the cursor.
- 4.+ Click with the mouse to insert the symbol.
A contact cross is placed automatically beneath the symbol. Existing contacts are shown in the contact cross. If you assign additional contacts to the relay coil later, then the corresponding cross-references are added to the contact cross.
- 5.+ Insert the relay coil again (path 6).
- 6.+ Insert the relay coil again (path 7).
Right-click to exit the insertion mode.

D.2.12. CONNECTING THE RELAY COIL ON PAGE 2

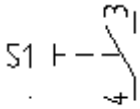
You will now connect relay coil **2K5** to the potential **L3** and potential **N**.

Quick guide:

- 1CA **Electrical**
- 2CO **1 wire (Wire Connections panel)**
- 3.+ Select the starting point of the wire on the potential L3, vertically above the connections of the relay coil 2K5.
- 4.+ Place the second point for the wire on the N potential.
Right-click to exit the wire drawing mode.

D.2.13. INSERTING CIRCUIT BREAKERS ON PAGE 2

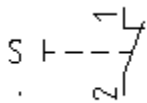
You will now insert **switches** on path 5 and path 7.
First, you will insert the **NO general** symbol.



Quick guide:

1. Double-click the **Switchgear, one-pole** symbol folder to open it.
2. Select the **NO general** symbol.
- 3.+ Select the place where you want to insert the first circuit breaker (NO) (path 5). The symbol is attached to the cursor.
- 4.+ Click with the mouse to insert the symbol in path 5
- 5.+ Select the place where you want to insert the second circuit breaker (NO) (path 7). The symbol is attached to the cursor.
- 6.+ Click with the mouse to insert the symbol in path 7.

Next, you will insert a **NC switch** in path 5.



Quick guide:

1. The **Switchgear, one pole** symbol folder is still open.
2. Select the **NC general** symbol.
- 3.+ Select the place where you want to insert the NC switch. The symbol is attached to the cursor.
- 4.+ Click the left mouse button to insert the symbol in path 5.
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 appears.
- 2.> Type
- 3.# TPS or TPB
Assign TPS to the circuit breaker NO, then assign TPB to the circuit breaker NC.
- 4.> OK
Please, 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 path 5 and 7.



Quick guide:

1. Double-click the **Relay-contacts, NC** symbol folder to open it.
2. Select the **1-pole NC** 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 at the top of path 5.
In the **Component Properties** dialogue box, assign the contact to the relay coil.
- 5.> Product (-)
- 6.# 2K7
- 7.> Connection Text 00
- 8.# 21
Fill in the connection number of the contact.
- 9.> Connection Text 01
- 10.# 22
Fill in the second connection number of the contact.
- 11.> **OK**
- 12.+ Insert the second break contact at the top of path 7 by clicking the left mouse button.
In the **Component Properties** dialogue box, assign the break contact to the appropriate relay coil
- 13.> Product (-)
- 14.# 2K5
- 15.> Connection Text 00
- 16.# 21
Fill in the connection number of the contact.
- 17.> Connection Text 01
- 18.# 22
Fill in the second connection number of the contact.
- 19.> **OK**
- 20.+ Insert another break contact at the bottom of path 7 by clicking the left mouse button.
In the **Component Properties** dialogue box, assign the break contact to the appropriate relay coil.
- 21.> Product (-)
- 22.# 2K6
- 23.> Connection Text 00
- 24.# 21
Fill in the connection number of the contact.
- 25.> Connection Text 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 path 5, 6, and 8.



Quick guide:

1. Open the **Relay-contacts, NO** symbol folder.
2. Select the **1-pole NO** symbol.
- 3.+ Select the place where you want to insert the first contact NO in path 5.
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.# 2K6
 - 7.> Connection Text 00
 - 8.# 13
 Fill in the connection number of the contact.
- 9.> Connection Text 01
- 10.# 14
- 11.> Fill in the second connection number of the contact.
OK
- 12.+ Select the place where you want to insert the contact NO in path 6. 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.# 2K5
 - 15.> Connection Text 00
 - 16.# 13
 Fill in the connection number of the contact.
- 17.> Connection Text 01
- 18.# 14
- 19.> Fill in the second connection number of the contact.
OK
- 20.+ Insert the contact again (path 8) by clicking the left mouse button.
In the **Component Properties** dialogue box, indicate the relay coil to which the contact belongs:
 - 21.> Product (-)
 - 22.# 2K7
 - 23.> Connection Text 00
 - 24.# 13
 Fill in the connection number of the contact.
- 25.> Connection Text 01
- 26.# 14
- 26.# Fill in the second connection number of the contact.

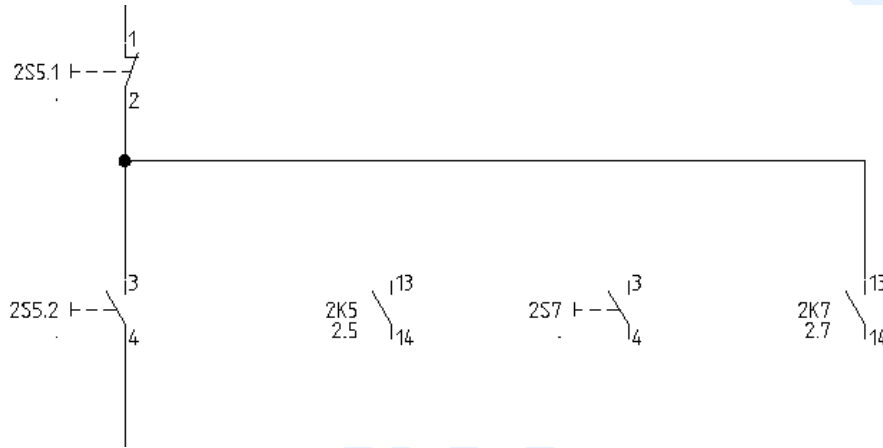
- 27.> **OK**
 Right-click to exit the insertion mode.
 The contacts appear in the contact cross of the corresponding relay coil.

D.2.16. DRAWING WIRES ON PAGE 2

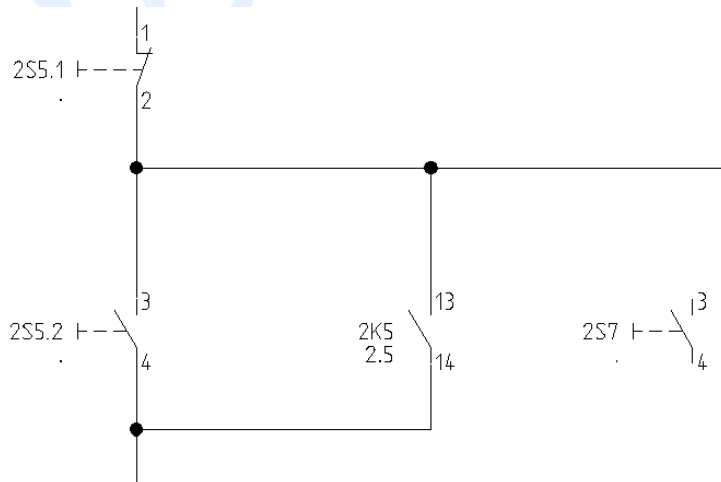
You will now connect the vertical wire in path 5 to the symbols in path 6, 7 and 8.

Quick guide:

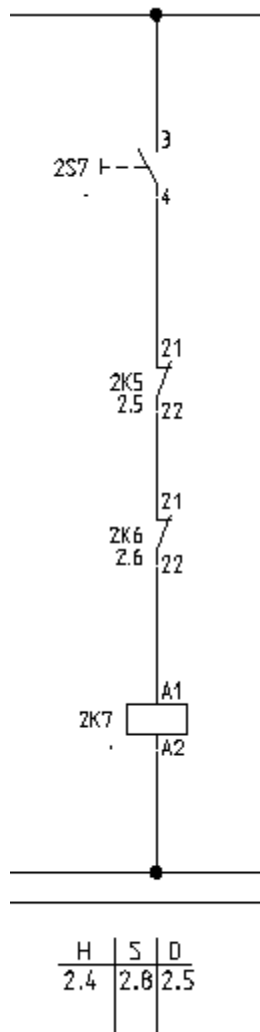
- 1CA **Electrical**
 2CO **1 wire (Wire Connections panel)**
 Draw the following wire first:



- 3.+ Select the starting point for the wire on the vertical connection between 2S5.1/2 and 2S5.2/3 in path 5.
 4.+ Draw the wire horizontally to path 8 over the upper connection of the contact NO. Place the corner point of the wire by clicking the left mouse button.
 5.+ Draw the wire vertically downwards to the top connection of the contact NO 2K7 in path 8.
 The node at the intersection point of the wire with the vertical connection appears automatically.
 Draw the next connection:

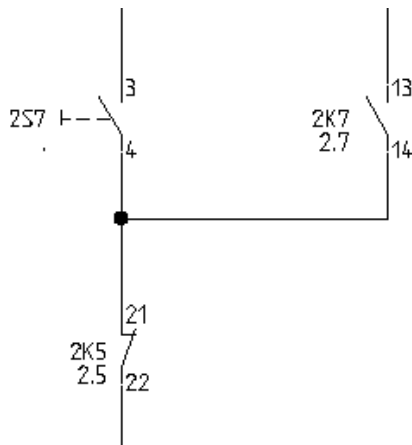


Draw the next connection in path 7, please:



- 12.+ Select the starting point for the wire on the horizontal connection above the switch in path 7 by clicking the left mouse button.
- 13.+ Draw the wire vertically downwards to the potential N. Place the ending point of the wire by clicking the left mouse button.
The nodes at the intersection point of the wire with the existing connections and potentials appear automatically.

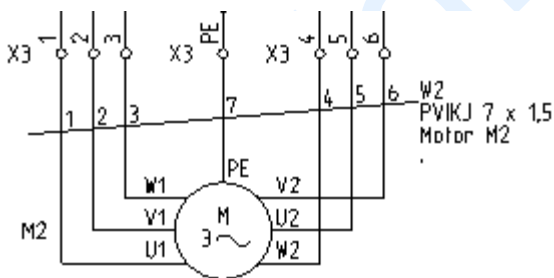
Draw finally the following wire:



- 14.+ Select the starting point for the wire on the vertical connection by clicking the left mouse button.
- 15.+ Draw the wire horizontally rightwards beneath the contact 2K7 in path 8. Place the corner point of the wire by clicking the left mouse button.
- 16.+ Draw the wire vertically upwards to the bottom connection of the NO contact 2K7. The node at the intersection point of the wire with the existing connection appears automatically. 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 X3 and motor M2.



Quick guide:

- 1CA **Electrical**
- 2CO **Cable (Cable panel)**
- Cables must run across wires, but 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 for the cable appears. It allows you to fill in the information for all cable cores. Fill in the desired information for 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 colours are filled in, according to the information from the Type Database.
- 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.
- 13.> OK
Right-click to exit the cable insertion mode.

HINTS

According to EN 61346-2 table 1, the letter code for cables must be "W".

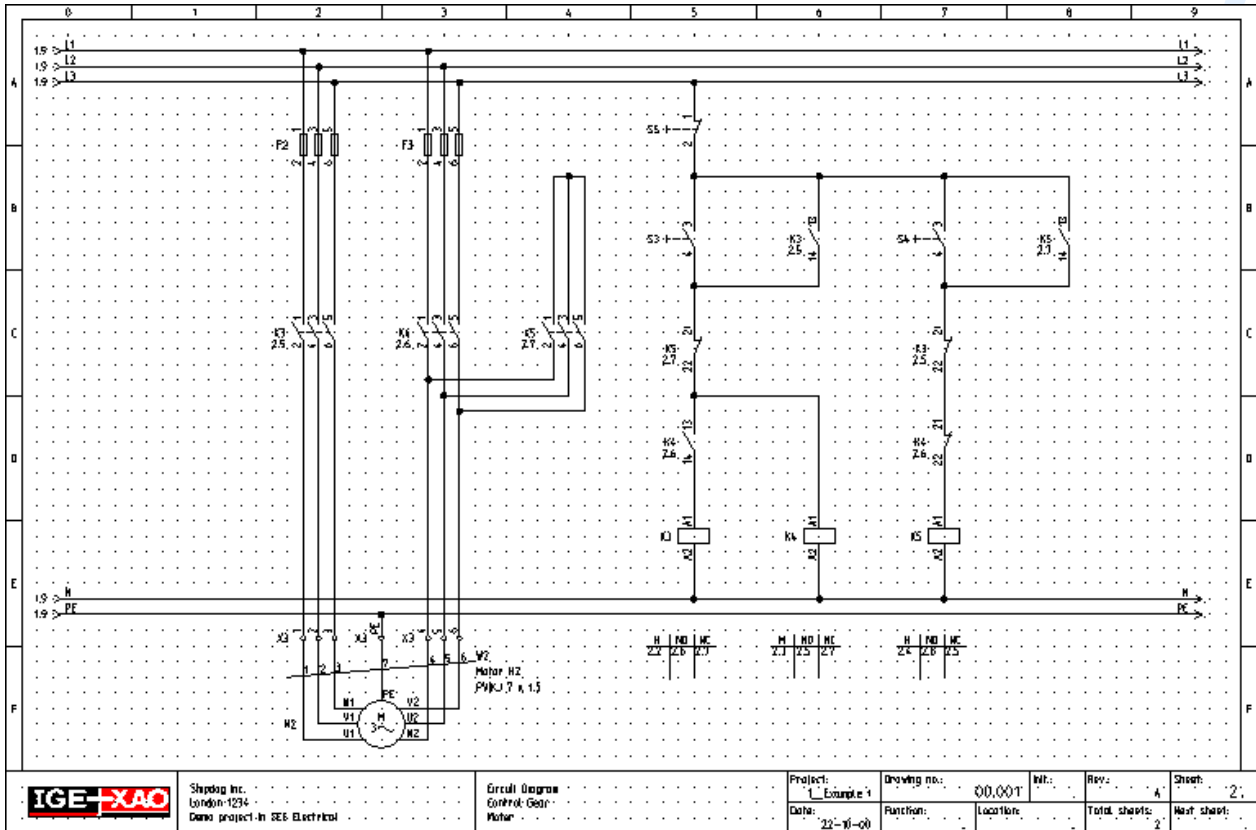
*If you use the advanced level of SEE Electrical and you have set user-defined cables via the **Cable Setup** button in the **Cables** tab of the **Circuit Diagrams Properties** window, the*

***Electrical > 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**

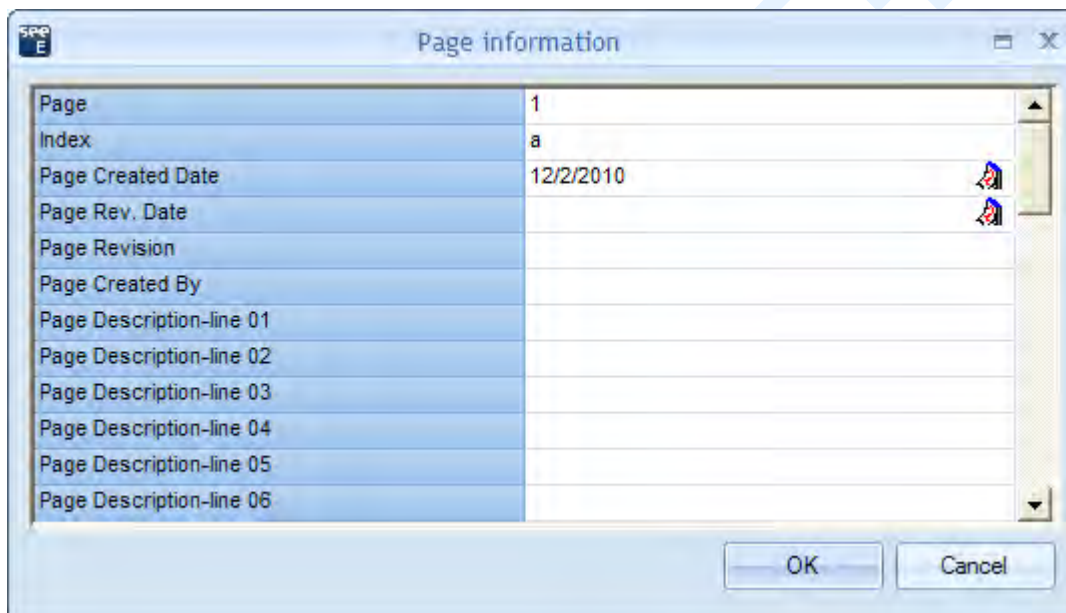
E ADDITIONAL PROCESSING OF CIRCUIT DIAGRAMS

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.

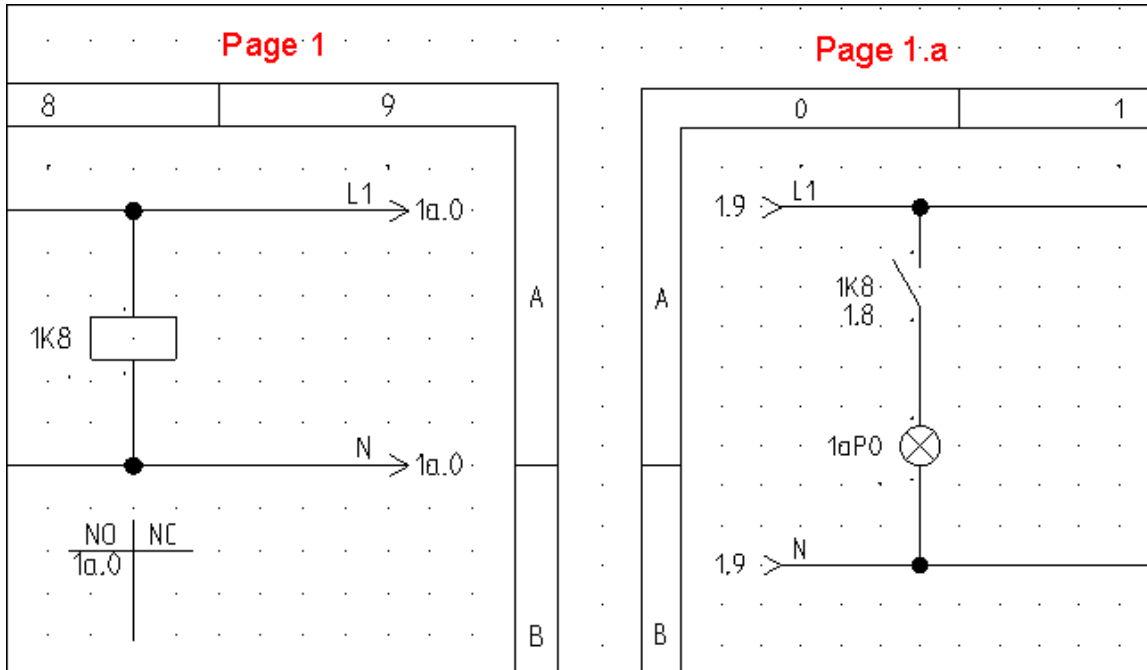


- 2.> Page
Change the page number.
- 3.# 1
- 4.> Index
- 5.# a
Type in the page index.
- 6.> **OK**
The page has been created.

Tutorial

COPYRIGHT © 2010 IGE+XAO. All rights reserved

Place a symbol of a lamp on page 1a. It is automatically named 1aP0, 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 for coils and contacts. They will also be updated using the information of the page index.



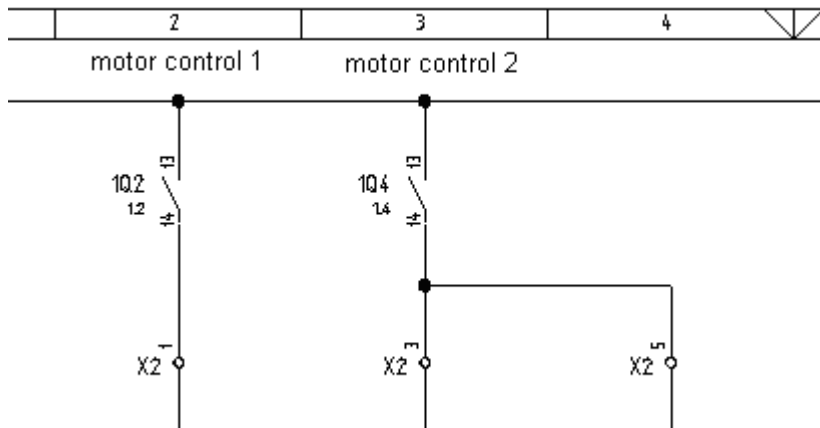
Saving the workspace

You must save the workspace.

1. **File > Save**



E.2. TEXTS

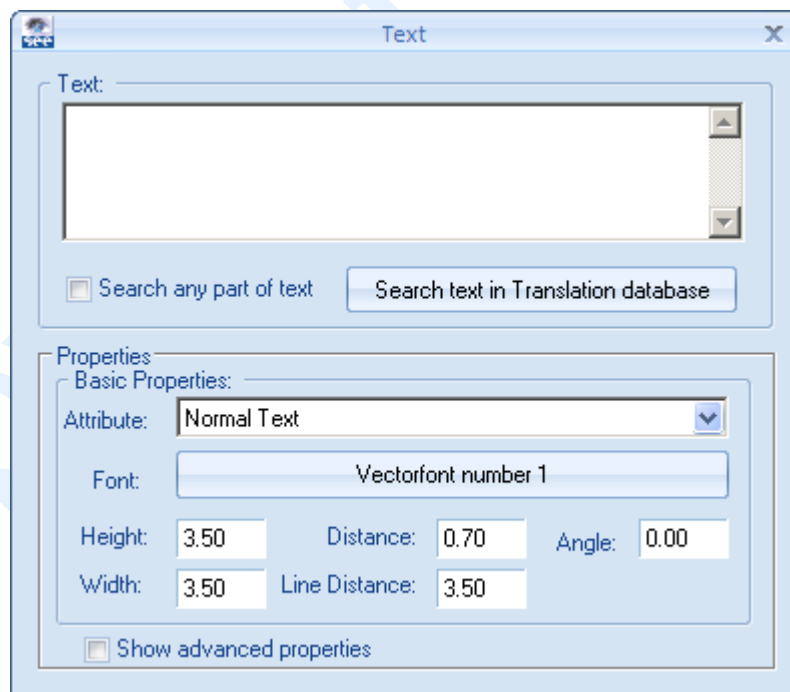
You can insert comment texts in a page. Insert the texts "Motor control 1" and "Motor control 2" in page 2.



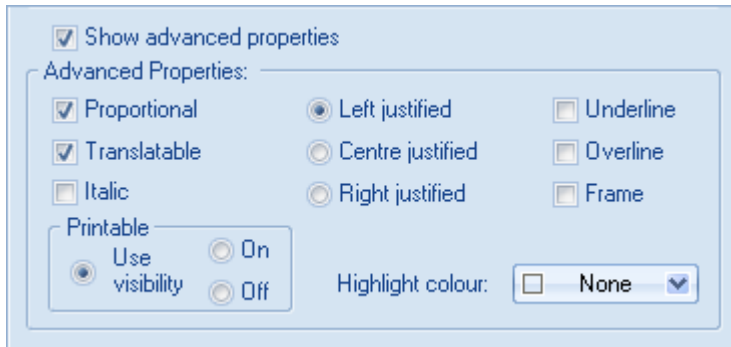
- 1.CA
- 2.CO


Draw
New Text (Elements panel)

You can click the  icon, too (the  icon allows you to create a new text, the  icon allows you to edit existing texts).




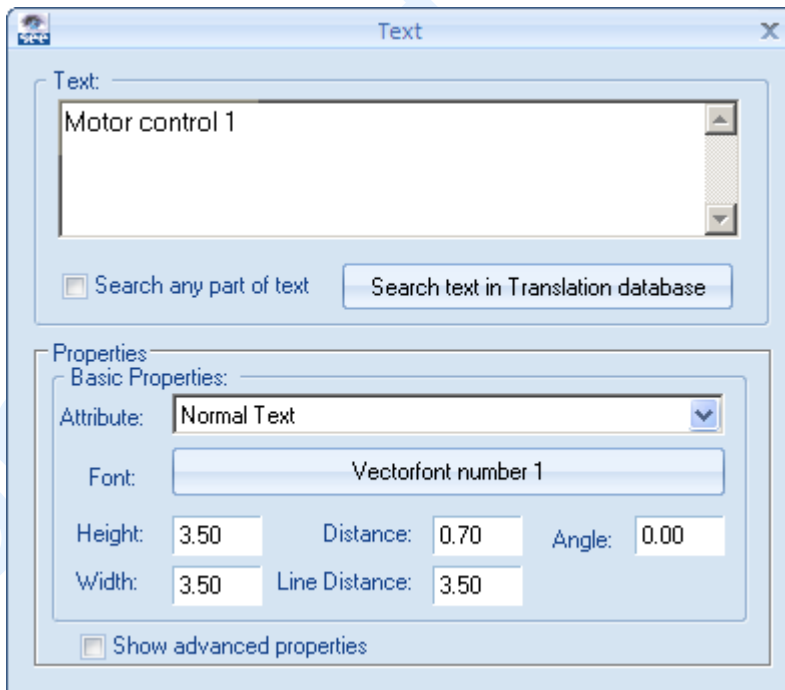
- 3.+ Move the cursor into the "**Text**" field.
- 4.# Motor control 1
Type in the text.
- 5.> Tick the "Show advanced properties" check box and select the desired text attributes, such as size, highlight colour and adjustment (Left justified, or Centre justified).




- 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 "**Text**" 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.M You can also click the  icon.
- 3.M Click the text you want to change.



- 4.+ Move the cursor into the "**Text**" field.
- 5.# <Text>
Change the text "Motor control 1" to "Motor 1".
The change can be seen directly in the drawing.

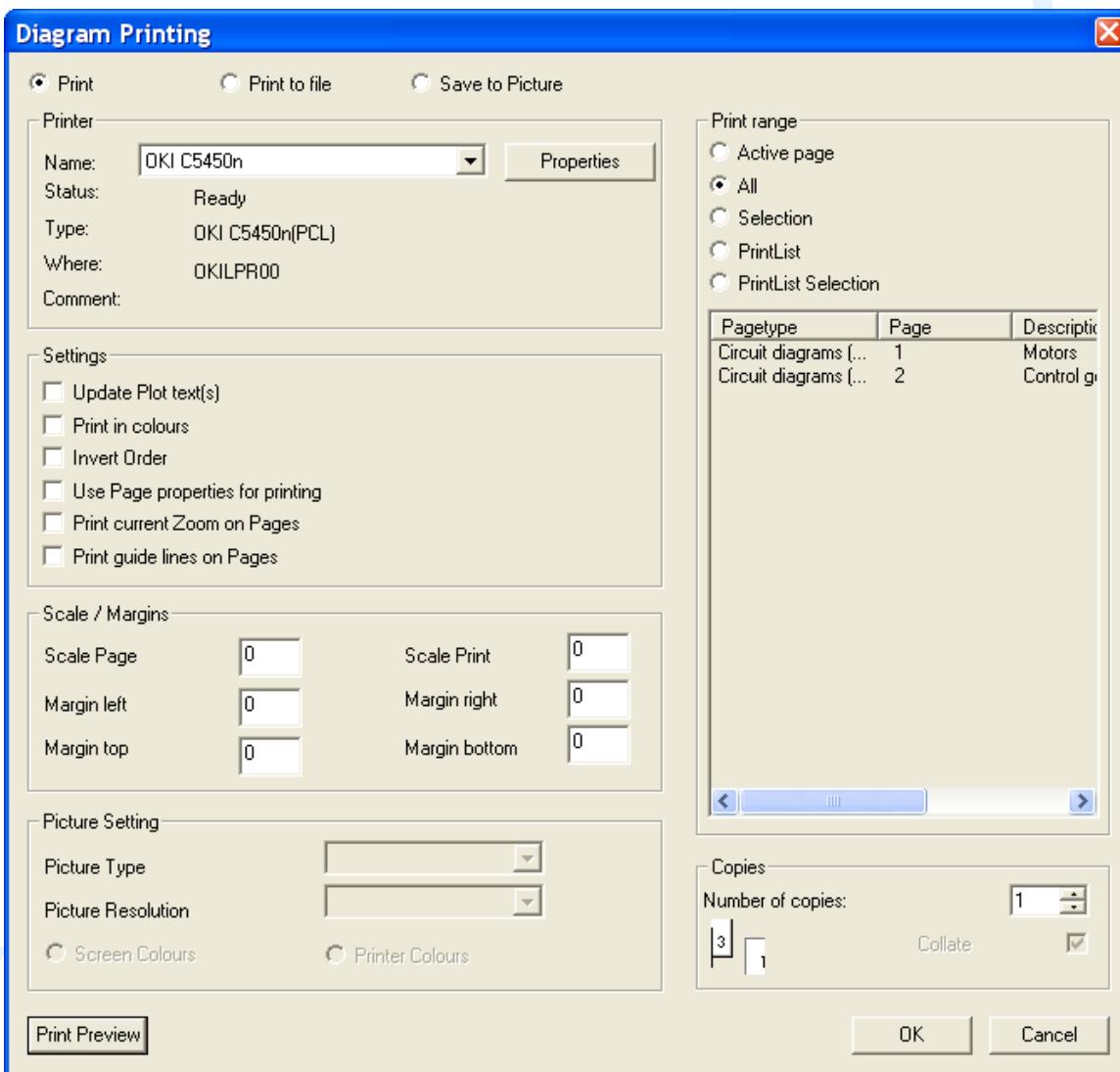
- 6.> If you want, tick the "**Show advanced properties**" check box and change the desired text attributes, such as size, highlight colour and adjustment (Left justified, or Centre justified).
- 7.+ Click the next text you want to change: "Motor control 2" to "Motor 2" for example. The **Text** dialogue box remains open.
- 8.+ Move the cursor into the "**Text**" field again.
9. Change the existing text etc.
- 10.> Click the  button to close the **Text** dialogue box.

F PRINTING

F.1. PRINT

After the project is completed, it can be printed.

- 1.CA **File**
- 2.CO **Print**
- 3.CO **Print**

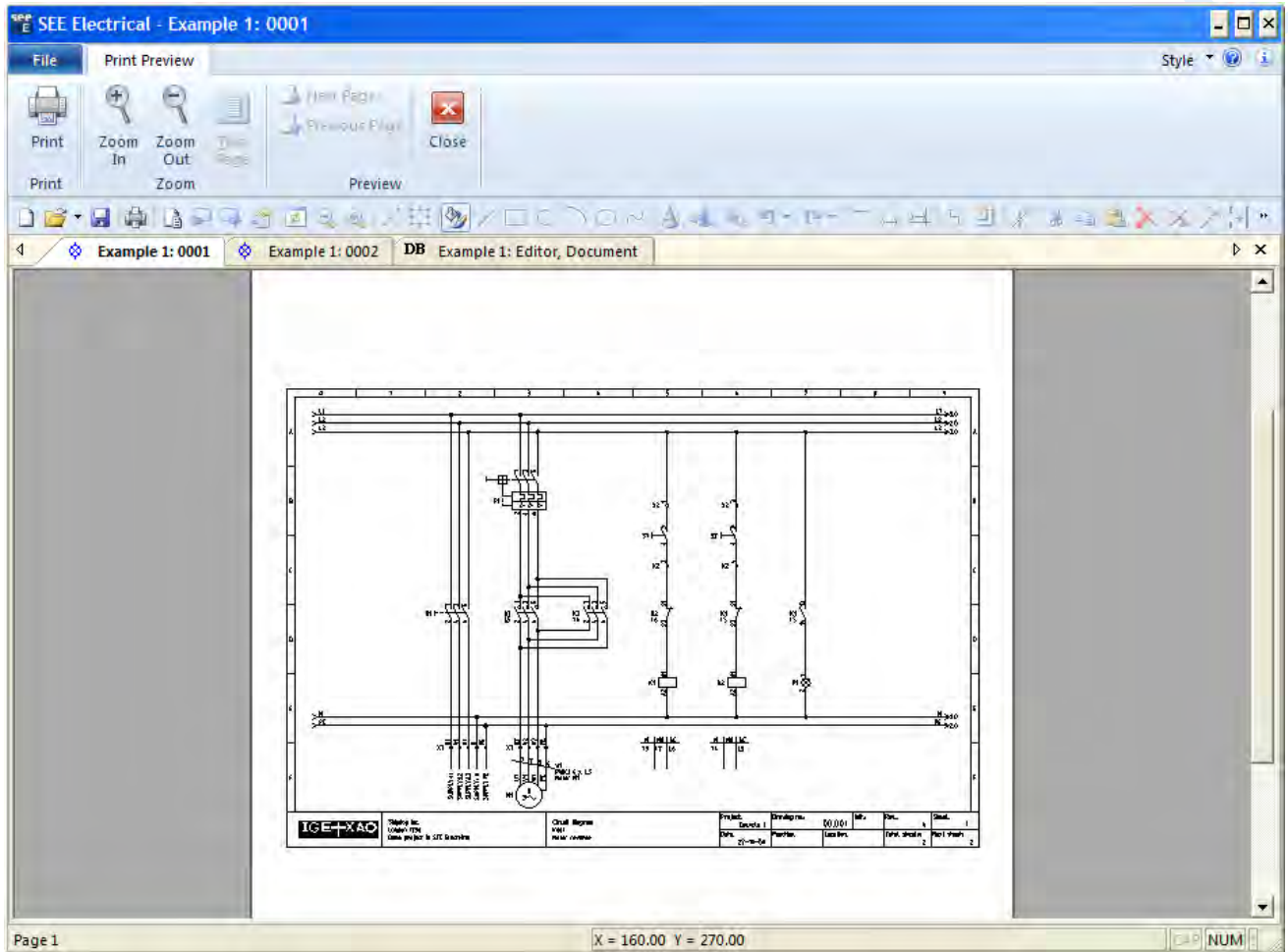



A print preview is available for single pages of the project. This function can be accessed by clicking the **Print Preview** button in the *Print* dialogue or by executing the **File > Print > Print Preview** command.

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*. The basic functions outlined here are only the tip of the iceberg in terms of what can be achieved using the package. 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.

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