`circuitikz-dutch`

Drawing electric circuits in Dutch textbooks

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This package sets up CircuiTi*k*Z to draw electric circuits with the conventions used in Dutch textbooks. After loading the `circuitikz` package, a number of patches will be applied to CircuiTi*k*Z commands.

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This work has the LPPL maintenance status "author-maintained".

This work consists of the files `circuitikz-dutch.sty` and `circuitikz-dutch-doc.tex`

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Package loading

Load the package by:
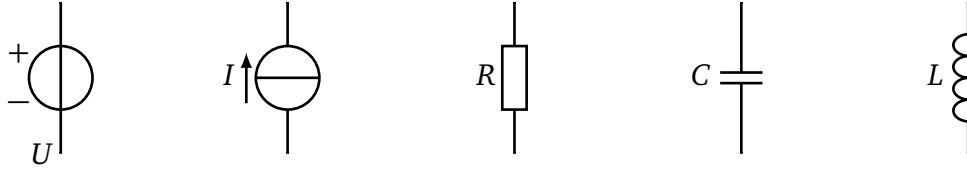
```
1  \usepackage{circuitikz-dutch}
```

The package has no options. CircuiTi*k*Z will be loaded by this package. Please **do not** (re)load CircuiTi*k*Z after this package.

The symbols

The symbols for voltage source, current source, resistor, capacitor and inductor are shown in Figure **??**.

Figure 1: *Dutch symbols for voltage source, current source, resistor, capacitor and inductor.*
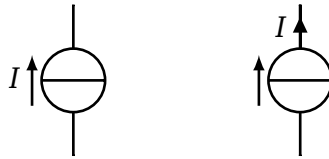
The CircuiTi*k*Z code to produce these symbols is shown below:

```
1 \begin{circuitikz}
2 \draw (0,0) to[V=$U$] ++(0,2);          % independent voltage source
3 \draw (2,0) to[I,label=$I$] ++(0,2);    % independent current source
4 \draw (4,0) to[R=$R$] ++(0,2);          % resistor
5 \draw (6,0) to[C=$C$] ++(0,2);          % capacitor
6 \draw (8,0) to[L=$L$] ++(0,2);          % inductor
7 \end{circuitikz}
```

Note: due to the present current drawing strategy, it's mandatory that you use a label when specifying the source's current. See Figure **??** below for the differences.

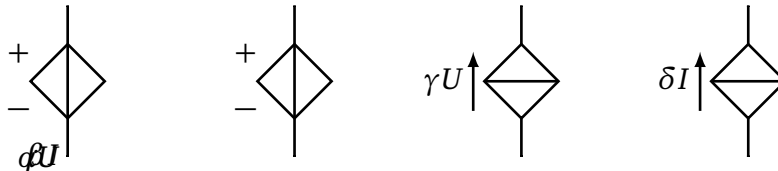**Figure 2:** *Differences in drawing current sources.*

The CircuiTi*k*Z code to produce these symbols is shown below:

```
1 \begin{circuitikz}
2 \draw (3,0) to[I,label=$I$] ++(0,2);
3 \draw (6,0) to[I=$I$] ++(0,2);
4 \end{circuitikz}
```

In Figure **??**, the dependent voltage and current sources are shown:

Figure 3: *Symbols for dependant sources.*

The code is shown below:

```
1 \begin{circuitikz}
2 \draw (0,0) to[cvsource=$\alpha U$] ++(0,2);
3 \draw (3,0) to[cvsource=$\beta I$] ++(0,2);
4 \draw (6,0) to[cisource,label=$\gamma U$] ++(0,2);
```

```
5 \draw (9,0) to[cisource,label=$\delta I$] ++(0,2);
6 \end{circuitikz}
```

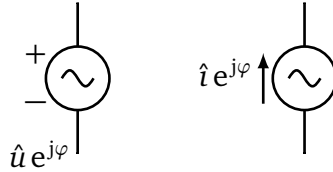Sinusiodal sources are shown below:

Figure 4: *Symbols for sinusiodal sources.*

Code to produce these symbols:

```
1 \begin{circuitikz}
2 \draw (0,0) to[sV=$\hat{u}\,\mathrm{e}^{\,\mathrm{j}\varphi}$] ++(0,2);
3 \draw (3,0)
      to[sI,label=$\hat{\imath}\,\mathrm{e}^{\,\mathrm{j}\varphi}$]
      ++(0,2);
4 \end{circuitikz}
```
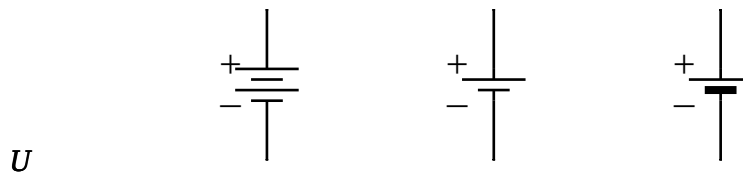
Batteries are shown in Figure **??**.

Figure 5: *Symbols for batteries.*

Code to produce these symbols:

```
1 \begin{circuitikz}
2 \draw (3,0) to[battery=$U$,invert] ++(0,2);
3 \draw (6,0) to[battery1=$U$,invert] ++(0,2);
4 \draw (9,0) to[battery2=$U$,invert] ++(0,2);
5 \end{circuitikz}
```

Voltages across components are displayed with '+' and '−', as shown in Figure **??**.
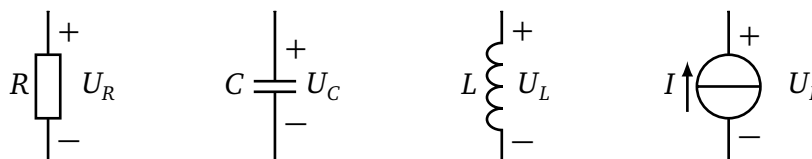

Figure 6: *Symbols with voltages.*

The code to produce the symbols is shown below:

3

```
1  \begin{circuitikz}
2  \draw (0,0) to[R=$R$, v<=$U_R$] ++(0,2);
3  \draw (3,0) to[C=$C$, v<=$U_C$] ++(0,2);
4  \draw (6,0) to[L=$L$, v<=$U_L$] ++(0,2);
5  \draw (9,0) to[I,label=$I$, v<=$U_I$] ++(0,2);
6  \end{circuitikz}
```

Displaying values and units

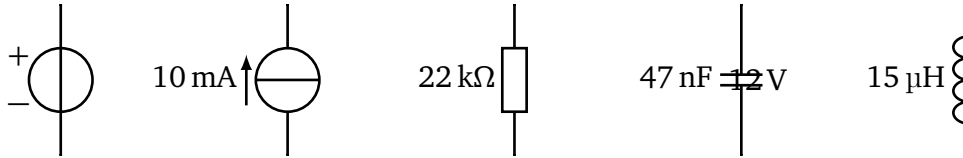You can use the `siunitx` package to put values and units to the symbols:

Figure 7: *Symbols with values and units.*

The code to produce these symbols:

```
1  \begin{circuitikz}
2  \draw (0,0) to[V=\SI{12}{\volt}] ++(0,2);
3  \draw (3,0) to[I,label=\SI{10}{\milli\ampere}] ++(0,2);
4  \draw (6,0) to[R=\SI{22}{\kilo\ohm}] ++(0,2);
5  \draw (9,0) to[C=\SI{47}{\nano\farad}] ++(0,2);
6  \draw (12,0) to[L=\SI{15}{\micro\henry}] ++(0,2);
7  \end{circuitikz}
```

Changes to the `circuitikz` package

The `circuitikz-dutch` package changes the following:

- Voltage sources have '+' and '−' glyphs left or right;

- Current sources have an arrow left or right;

- Resistors are of European type;

- Inductors are of American type;

- Voltages across components have '+' and '−' glyphs left or right;

- Line width is set to 1 pt for all Ti*k*Z pictures;

- Relative thickness of bipoles, tripoles and quadpoles are set to 1;

- The proportions of the components are set to better proportions;

- The package `siunitx` is loaded;

Example network

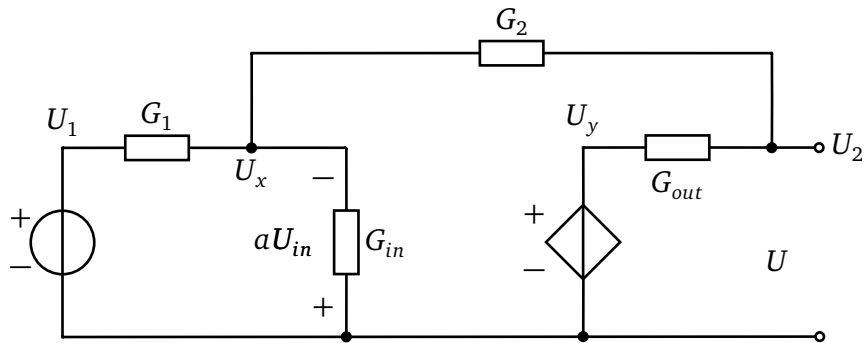In Figure **??** you see a network with a simplified model of an opamp.

Figure 8: *Network with a simplified model of an opamp.*

The code to produce this circuit is show below:

```
1  \begin{tikzpicture}[scale=1.25]
2  \draw (0,0) to[V, v=$U$] ++(0,2) node[above] {$U_1$}
3            to[R, R=$G_1$, -*] ++(2,0) node (2) {} node[below] {$U_x$}
4        (2) to[short] ++(1,0)
5            to[open] ++(0,-2)
6            to[R, a=$G_{in}$, v^>=$U_{in}$,*-] ++(0,2)
7        (2) to[short] ++(0,1)
8            to[R=$G_2$] ++(5.5,0)
9            to[short, -*] ++(0,-1) node (3) {}
10           to[short, -o] ++(0.5,0) node[right] {$U_{2}$}
11       (3) to[R=$G_{out}$]  ++(-2,0) node [above] {$U_y$}
12           to[cV, v_<=$aU_{in}$, -*] ++(0,-2)
13           to[open] ++(2.5,0)
14           to[short, o-.] (0,0)
15  ;
16  \end{tikzpicture}
```

Changelog

Version	Date	What
v0.1	2019/06/23	First release