ChemPID: A Tikz-based PID drawer for LaTeX

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Contents

1 Introduction

Welcome to this humble LateX package that allows you to draw Piping & Instrumentation Diagrams (P&ID) or block diagrams quickly and efficiently. It contains pre-built assets in pgf to create P&ID drawings. We noticed that, with the diminishing compile time on Overleaf, it became increasingly difficult to use TikZ to this end. Therefore, we chose for pgf because it is faster to compile than TikZ objects. The objects themselves have been made in accordance with the ISO 10628-2 standard. In case you would need an example on how to use the package. You can check our Github page (https://github.com/RRaike/chempid) and the .tex files in the docs/Sections subfolders.

We worked long and hard to bring this to you and we really hope that it helps your in you endeavors! If you would have any remarks or questions, then please do reach out!

2 Anchors

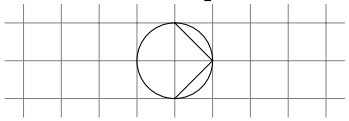
The anchors are possibly the most imporant part of these figures since they allow you to connect these figures to the rest of your drawing. Therefore, we have tried to make the anchors as consistent as possible in terms of naming. The most common abbreviations for anchors that you will find in Section 4 are the following:

Abbreviation	Anchor name	Abbreviation	Anchor name
N	north	S	south
nN	near north	nS	near south
fN	far north	fS	far south
E	east	W	west
nE	near east	nW	near west
fE	far east	fW	far west
NE	northeast	SE	southeast
nNE	near northeast	nSE	near southeast
fNE	far northeast	fSE	far southeast
NW	northwest	SW	southwest
nNW	near northwest	nSW	near southwest
fNW	far northwest	fSW	far southwest

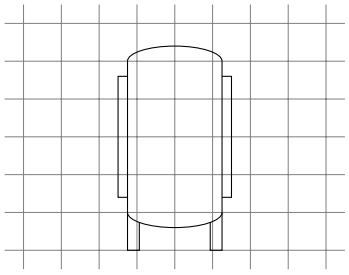
Most assets will only use (a selection of) these anchors. **Not every anchor is defined for every asset. Please check the section of the asset to see which are defined for that asset.** If it uses more than these, they are specified in the section of that asset, e.g. Tanks.

3 Accessing options

Accessing options is facilitated through pgfkeys, which makes them snappy. The keys though which to access them are the names of the assets, with the exception of the dished tank which uses the tank options. An example makes this much more clear. **Note that these commands exists within a tikzpicture environment.**



```
\node[pump, /pump = reciprocating]
```



```
\node[dished tank, /tank, legs, /tank = jacket]
```

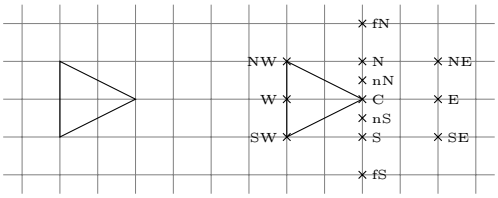
4 Assets

4.1 Valves

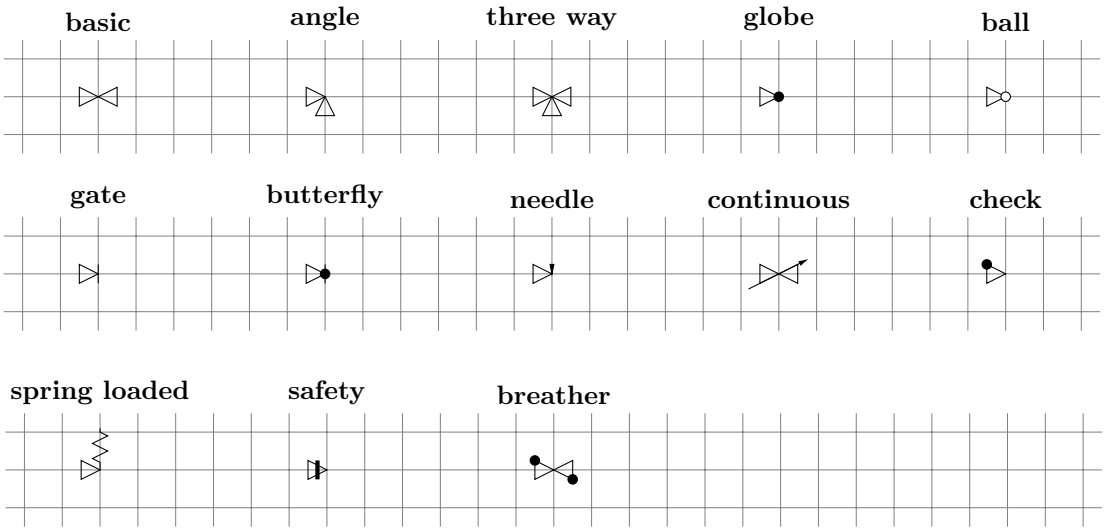
4.1.1 Anchors

A valve is one of the cornerstones of a flowsheet or P&ID. The base asset for a valve in this package is only half of a two-way valve to allow for maximal flexibility.

\node[valve, scale = 4]



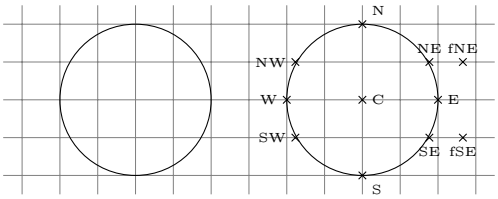
4.1.2 Options



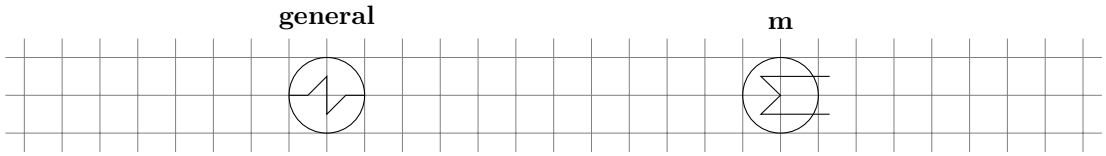
4.2 Round heat exchanger

4.2.1 Anchors

\node[HE round, scale = 2]

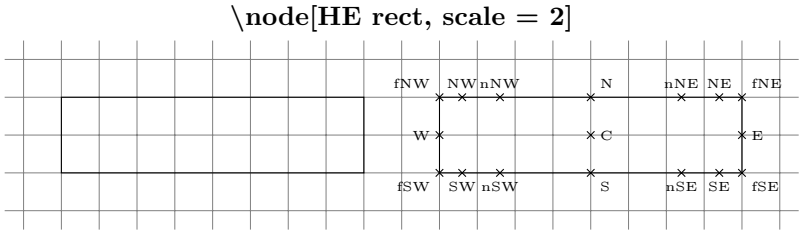


4.2.2 Options

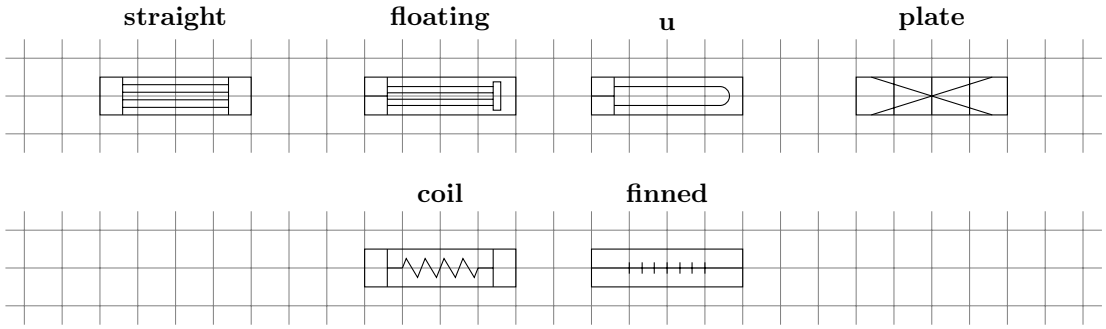


4.3 Rectangular heat exchanger

4.3.1 Anchors

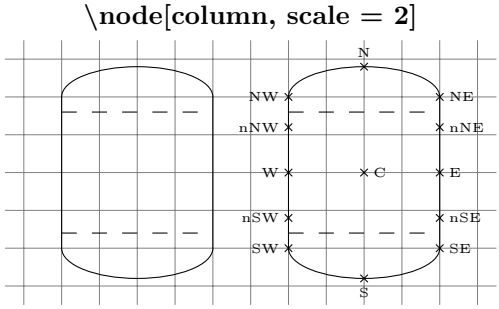


4.3.2 Options

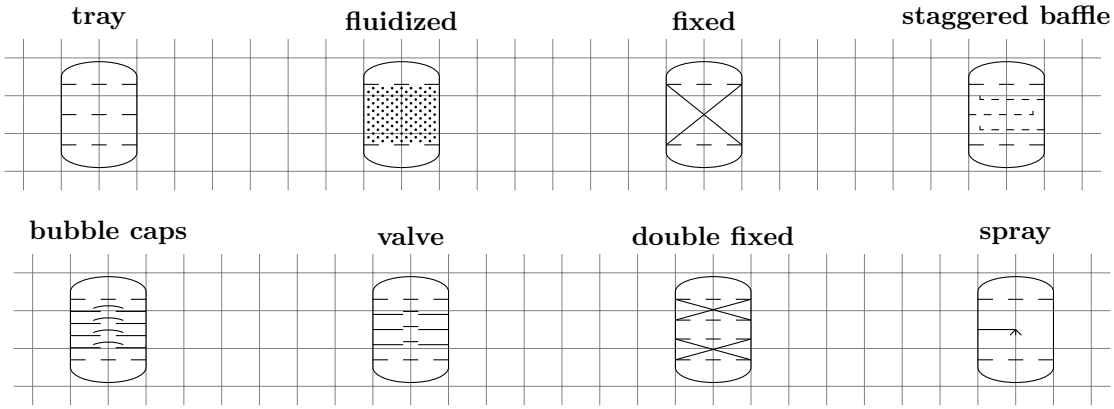


4.4 Columns

4.4.1 Anchors

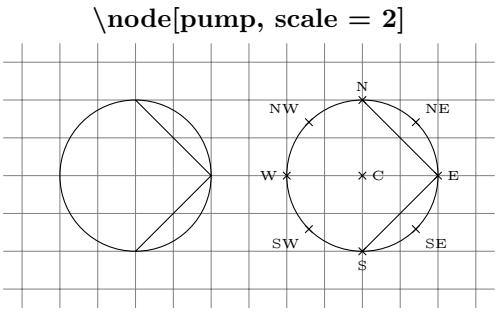


4.4.2 Options

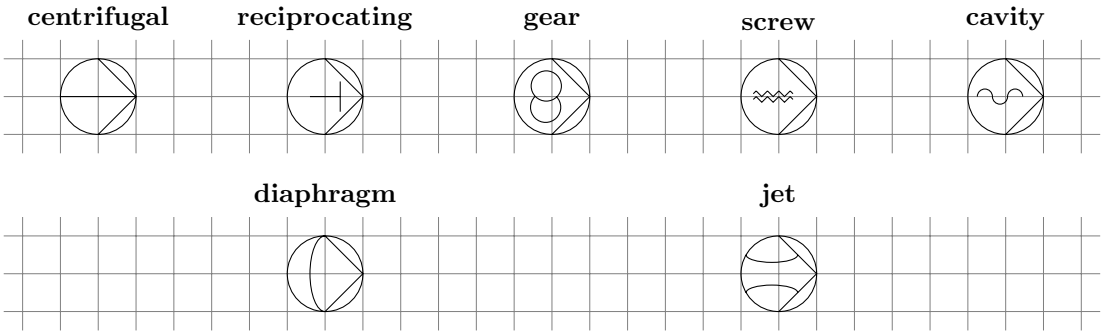


4.5 Pumps

4.5.1 Anchors



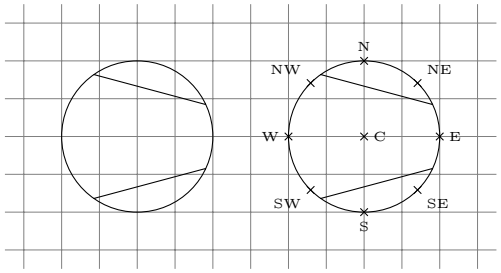
4.5.2 Options



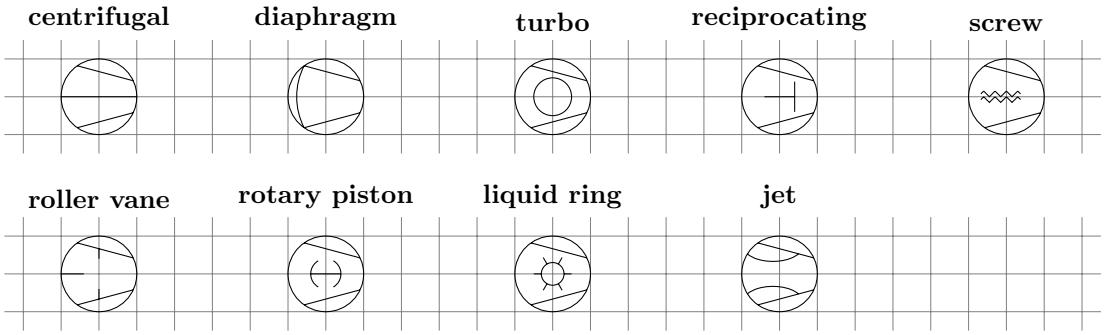
4.6 Compressors

4.6.1 Anchors

\node[compressor, scale = 2]



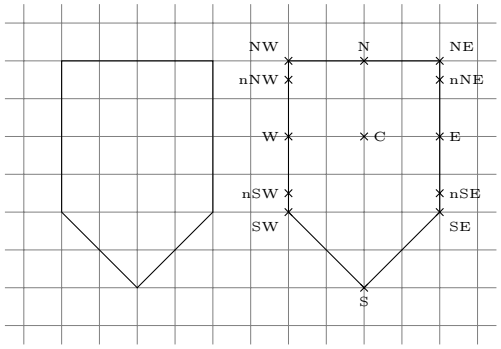
4.6.2 Options



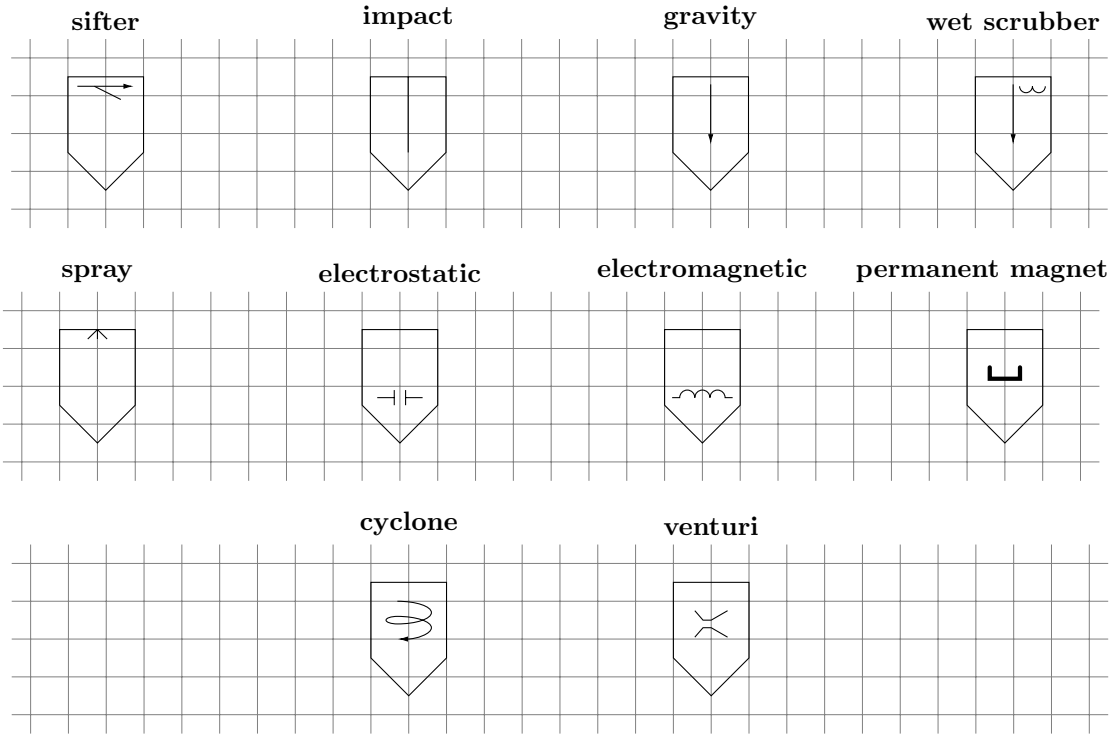
4.7 Separators

4.7.1 Anchors

\node[column, scale = 2]



4.7.2 Options



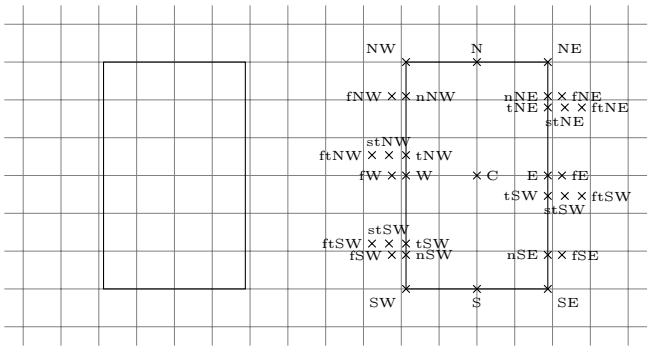
4.8 Tanks

4.8.1 Anchors

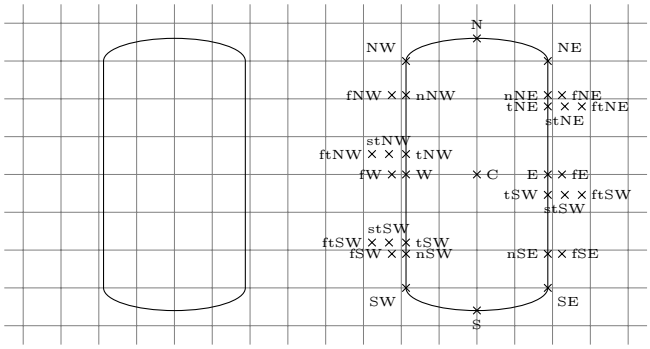
The anchors specifically defined for the tank asset are:

Abbreviation	Anchor name	Abbreviation	Anchor name
tNE	tube northeast	tSE	tube southeast
stNE	semi-tube northeast	stSE	semi-tube southeast
ftNE	full-tube northeast	ftSE	full-tube southeast
tNW	tube northwest	tSW	tube southwest
stNW	semi-tube northwest	stSW	semi-tube southwest
ftNW	full-tube northwest	ftSW	full-tube southwest

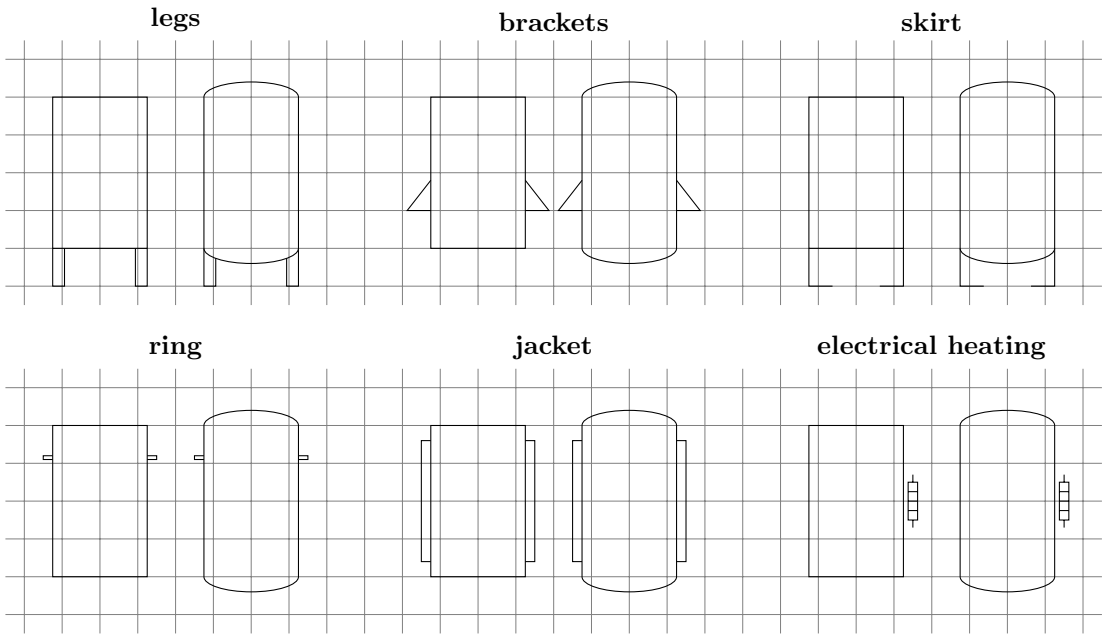
\node[tank, scale = 1.5]

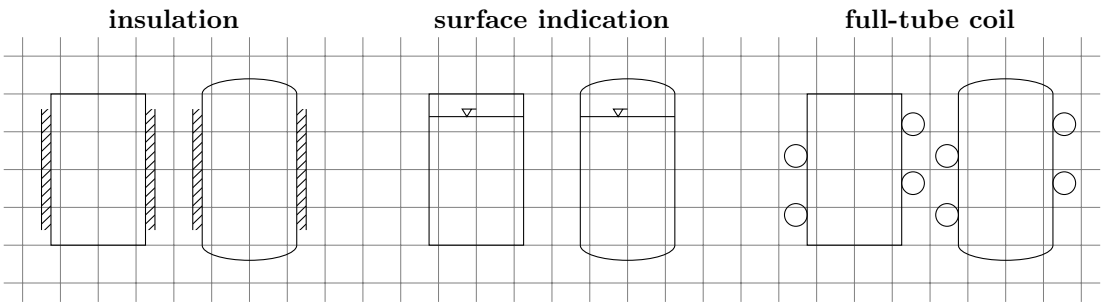


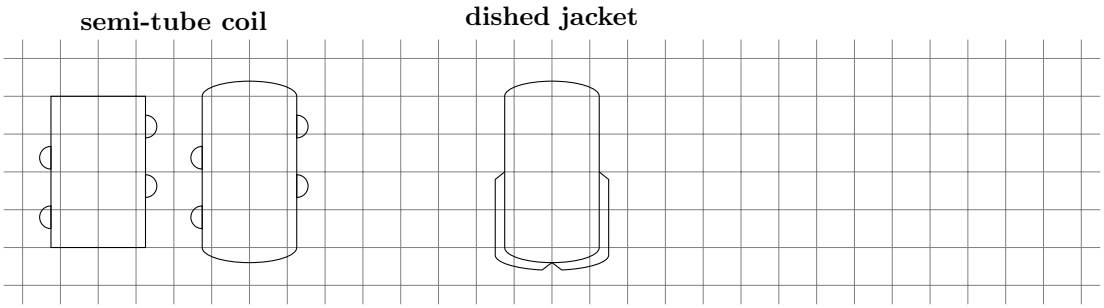
\node[dished tank, scale = 1.5]



4.8.2 Options

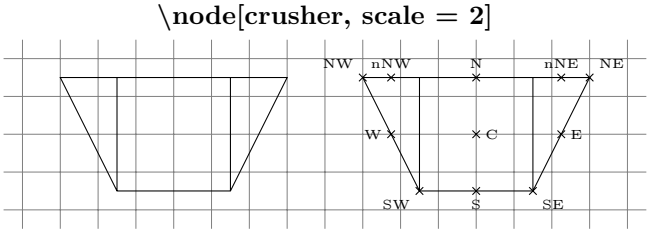




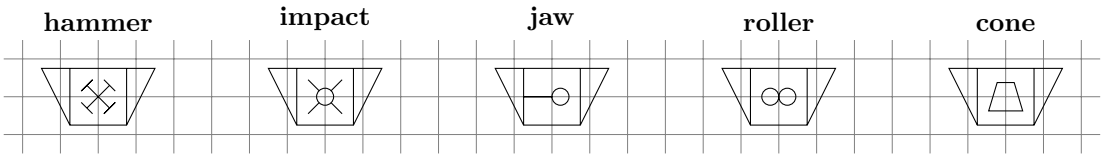


4.9 Crushers

4.9.1 Anchors



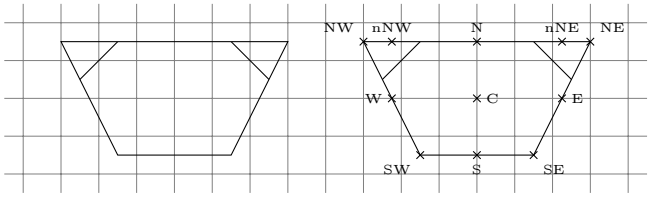
4.9.2 Options



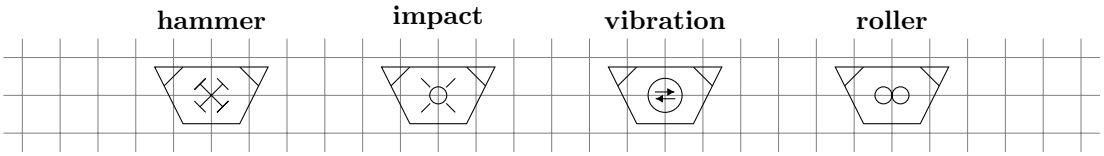
4.10 Mills

4.10.1 Anchors

\node[mill, scale = 2]



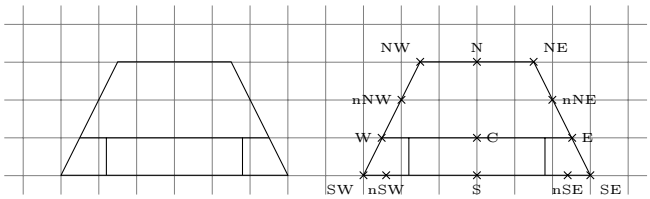
4.10.2 Options



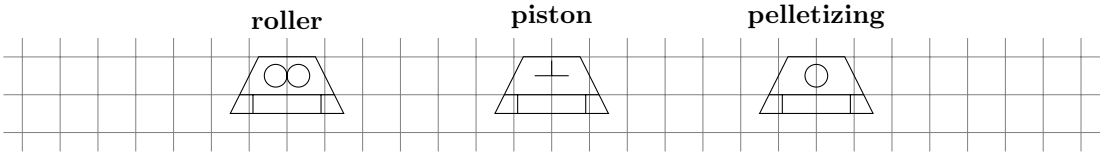
4.11 Press

4.11.1 Anchors

\node[press, scale = 2]



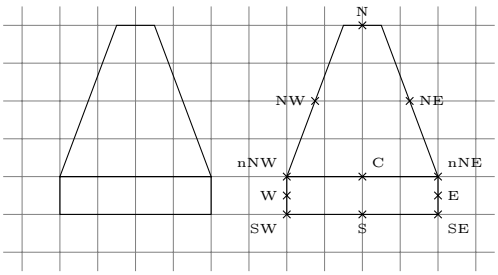
4.11.2 Options



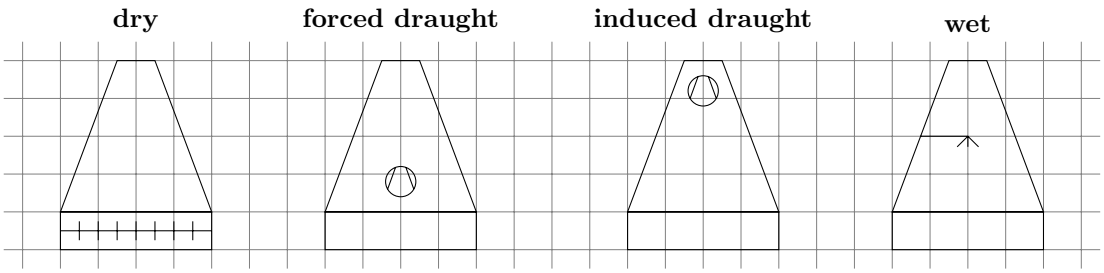
4.12 Cooling towers

4.12.1 Anchors

\node[cooling tower, scale = 1]



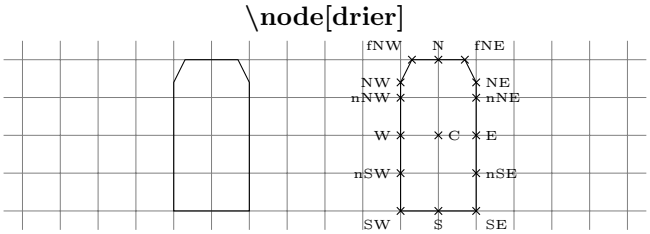
4.12.2 Options



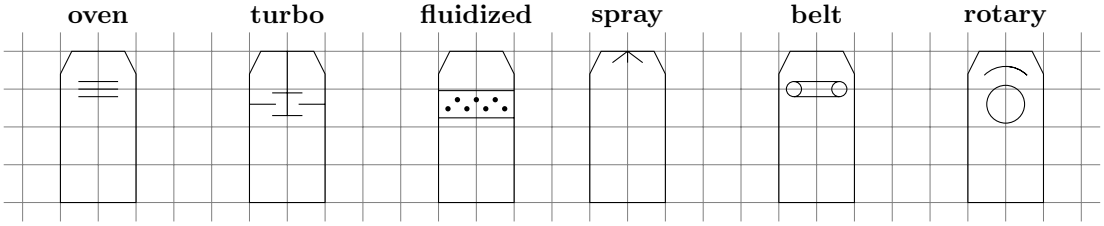
4.13 Driers

4.13.1 Anchors

\node[drier]

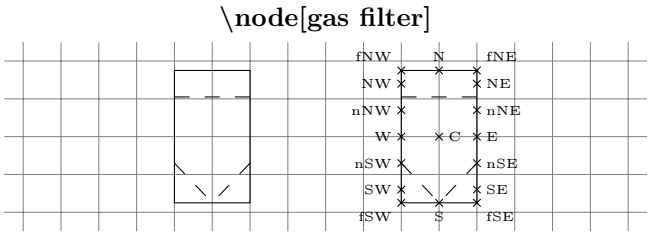


4.13.2 Options

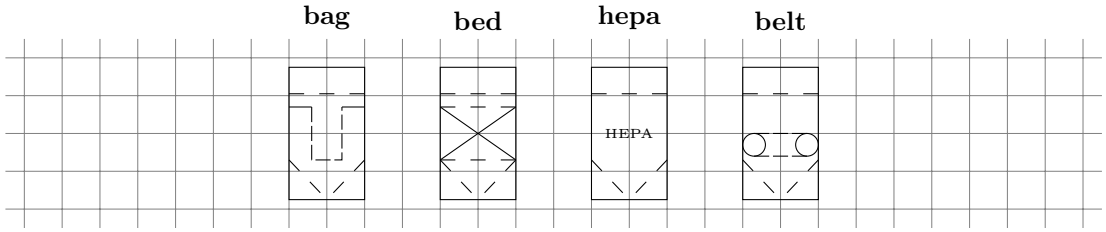


4.14 Gas filters

4.14.1 Anchors

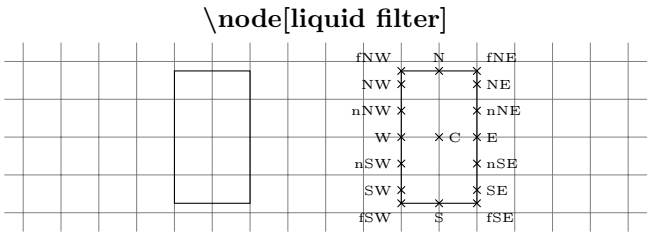


4.14.2 Options

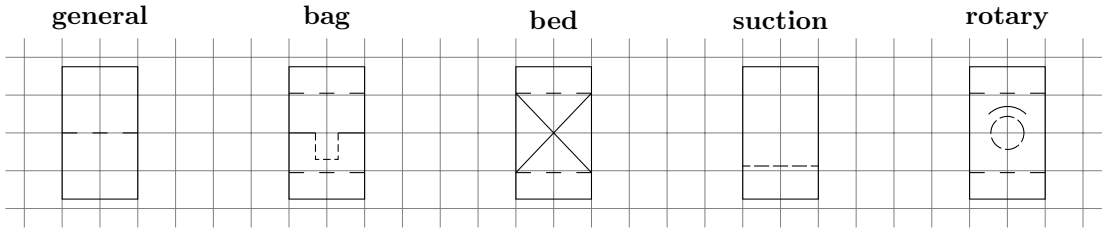


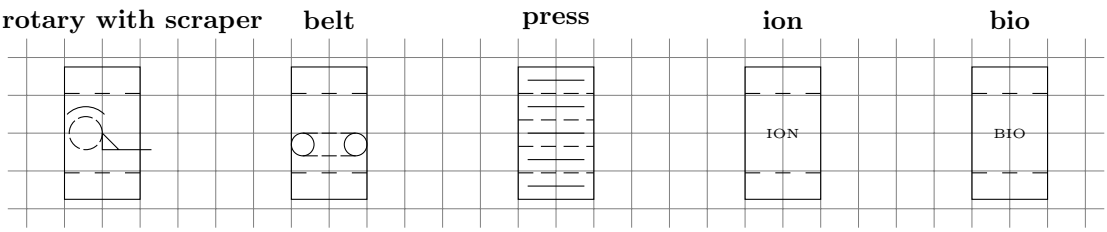
4.15 Liquid filters

4.15.1 Anchors



4.15.2 Options



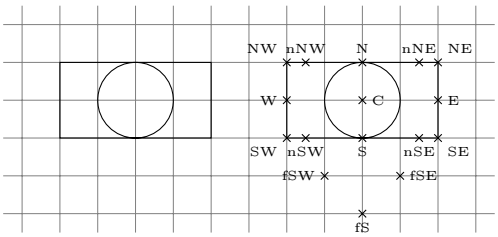


4.16 Fittings

4.16.1 Viewing glass

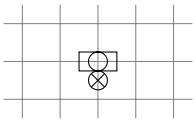
4.16.1.1 Base

\node[viewing glass, scale = 4]



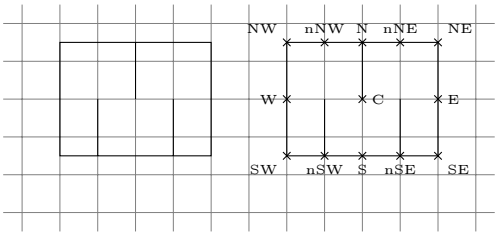
4.16.1.2 Options

lighting



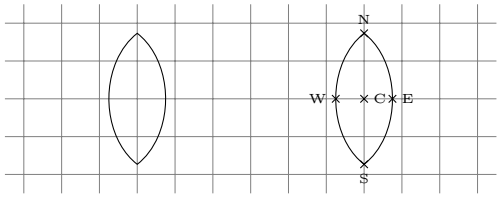
4.16.2 Silencer

\node[silencer, scale = 4]



4.16.3 Compensator

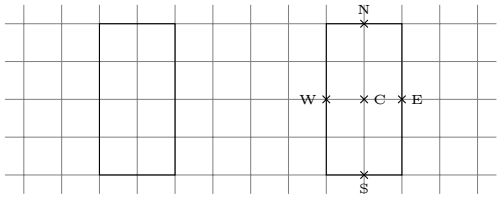
\node[compensator, scale = 4]



4.16.4 Strainer

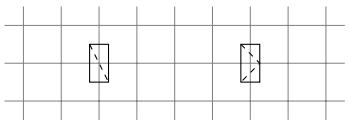
4.16.4.1 Base

\node[strainer, scale = 4]



4.16.4.2 Options

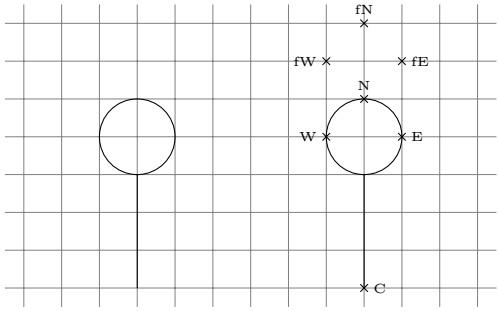
general **cone**



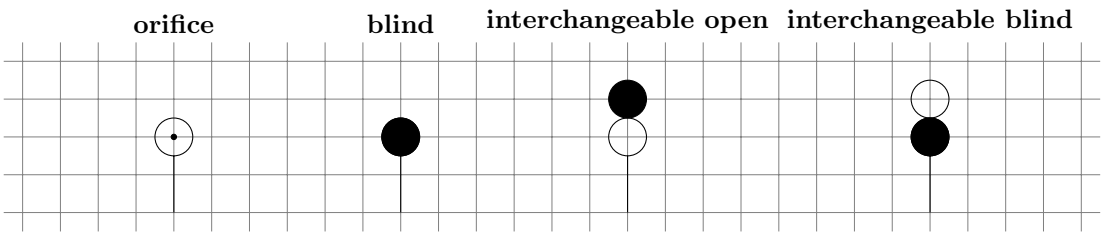
4.16.5 Disc

4.16.5.1 Base

\node[disc, scale = 2]

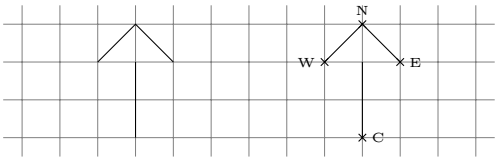


4.16.5.2 Options



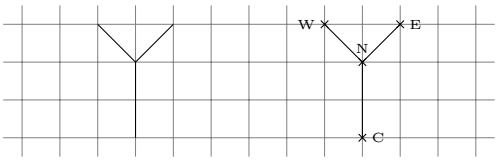
4.16.6 Vent

\node[vent, scale = 2]



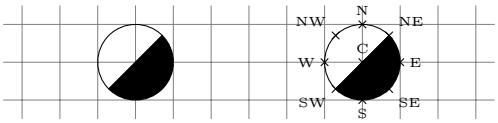
4.16.7 Funnel

\node[funnel, scale = 2]



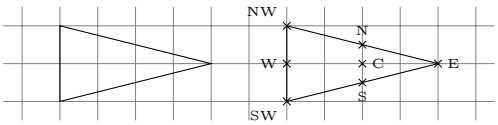
4.16.8 Steam trap

\node[steam trap, scale = 2]



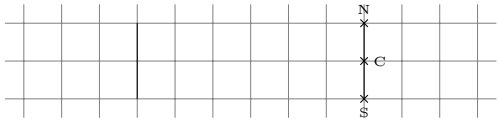
4.16.9 Reducer

\node[reducer, scale = 2]



4.16.10 Flange

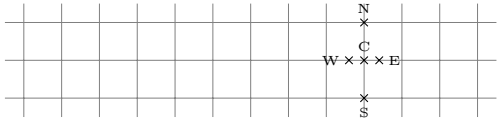
\node[flange, scale = 2]



4.16.11 Connection

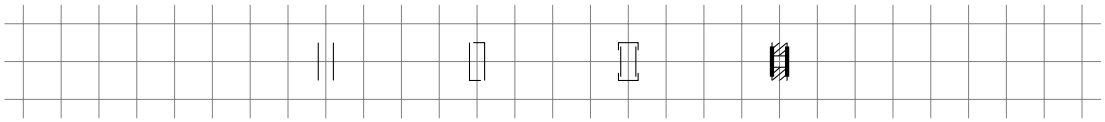
4.16.11.1 Base

\node[connection, scale = 2]



4.16.11.2 Options

flanged **coupling** **clamped** **breakthrough**



4.16.12 Hose

\node[hose]