$$
H_{112} = \left[\begin{array}{cccccccccccc}
-6\,\mu+2\,U & \frac{-t}{2}-\frac{\mathbf{i}}{2}\sqrt{3}\,t & 0 & \frac{3\sqrt{\frac{3}{2}}\,t}{2}-\frac{\frac{3}{2}\mathbf{i}\,t}{\sqrt{2}} & 0 & \frac{\sqrt{\frac{3}{2}}\,t}{2}+\frac{\frac{3}{2}\mathbf{i}\,t}{\sqrt{2}} & 0 & \frac{3\,\mathbf{i}}{2}\,t-\frac{\sqrt{3}\,t}{2} & 0 & 0 & 0 & 0 \\
\frac{-t}{2}+\frac{\mathbf{i}}{2}\sqrt{3}\,t & -6\,\mu+2\,U & 0 & 0 & \sqrt{\frac{3}{2}}\,t & 0 & \frac{3\sqrt{\frac{3}{2}}\,t}{2}+\frac{\frac{3}{2}\mathbf{i}\,t}{\sqrt{2}} & 0 & 0 & \frac{-\left(\sqrt{\frac{3}{2}}\,t\right)}{2}-\frac{\frac{3}{2}\mathbf{i}\,t}{\sqrt{2}} & 0 & 0 \\
0 & 0 & -6\,\mu & \mathbf{i}\sqrt{\frac{3}{2}}\,t+\frac{3\,t}{\sqrt{2}} & 0 & \mathbf{i}\sqrt{\frac{3}{2}}\,t-\frac{t}{\sqrt{2}} & 0 & 0 & \mathbf{i}\sqrt{\frac{3}{2}}\,t-\frac{t}{\sqrt{2}} & 0 & 0 & 0 \\
\frac{3\sqrt{\frac{3}{2}}\,t}{2}+\frac{\frac{3}{2}\mathbf{i}\,t}{\sqrt{2}} & 0 & -\mathbf{i}\sqrt{\frac{3}{2}}\,t+\frac{3\,t}{\sqrt{2}} & -6\,\mu+U & -t & 0 & 0 & 0 & 0 & \frac{-t}{2}-\frac{\mathbf{i}}{2}\sqrt{3}\,t & \frac{\mathbf{i}}{2}\sqrt{\frac{3}{2}}\,t+\frac{3\,t}{2\sqrt{2}} & 0 \\
0 & \sqrt{\frac{3}{2}}\,t & 0 & -t & -6\,\mu+U & 0 & 0 & 0 & \frac{t}{2}-\frac{\mathbf{i}}{2}\sqrt{3}\,t & 0 & 0 & \frac{t}{\sqrt{2}} \\
\frac{\sqrt{\frac{3}{2}}\,t}{2}-\frac{\frac{3}{2}\mathbf{i}\,t}{\sqrt{2}} & 0 & -\mathbf{i}\sqrt{\frac{3}{2}}\,t-\frac{t}{\sqrt{2}} & 0 & 0 & -6\,\mu+U & \frac{-3\,t}{2}-\frac{\mathbf{i}}{2}\sqrt{3}\,t & 0 & 0 & 0 & \frac{-\mathbf{i}}{2}\sqrt{\frac{3}{2}}\,t+\frac{t}{2\sqrt{2}} & 0 \\
0 & \frac{3\sqrt{\frac{3}{2}}\,t}{2}-\frac{\frac{3}{2}\mathbf{i}\,t}{\sqrt{2}} & 0 & 0 & 0 & \frac{-3\,t}{2}+\frac{\mathbf{i}}{2}\sqrt{3}\,t & -6\,\mu+U & -\mathbf{i}\sqrt{\frac{3}{2}}\,t-\frac{3\,t}{\sqrt{2}} & 0 & 0 & 0 & \frac{\mathbf{i}}{2}\sqrt{\frac{3}{2}}\,t+\frac{t}{2\sqrt{2}} \\
\frac{-3\,\mathbf{i}}{2}\,t-\frac{\sqrt{3}\,t}{2} & 0 & 0 & 0 & 0 & 0 & \mathbf{i}\sqrt{\frac{3}{2}}\,t-\frac{3\,t}{\sqrt{2}} & -6\,\mu+U & 0 & 0 & \frac{t}{2}+\frac{\mathbf{i}}{2}\sqrt{3}\,t & 0 \\
0 & 0 & -\mathbf{i}\sqrt{\frac{3}{2}}\,t-\frac{t}{\sqrt{2}} & 0 & \frac{t}{2}+\frac{\mathbf{i}}{2}\sqrt{3}\,t & 0 & 0 & 0 & -6\,\mu+U & -t & 0 & 0 \\
0 & \frac{-\left(\sqrt{\frac{3}{2}}\,t\right)}{2}+\frac{\frac{3}{2}\mathbf{i}\,t}{\sqrt{2}} & 0 & \frac{-t}{2}+\frac{\mathbf{i}}{2}\sqrt{3}\,t & 0 & 0 & 0 & 0 & -t & -6\,\mu+U & 0 & \frac{-\mathbf{i}}{2}\sqrt{\frac{3}{2}}\,t+\frac{t}{2\sqrt{2}} \\
0 & 0 & 0 & \frac{-\mathbf{i}}{2}\sqrt{\frac{3}{2}}\,t+\frac{3\,t}{2\sqrt{2}} & 0 & \frac{\mathbf{i}}{2}\sqrt{\frac{3}{2}}\,t+\frac{t}{2\sqrt{2}} & 0 & \frac{t}{2}-\frac{\mathbf{i}}{2}\sqrt{3}\,t & 0 & 0 & -6\,\mu+2\,U & \frac{-3\,t}{2}+\frac{\mathbf{i}}{2}\sqrt{3}\,t \\
0 & 0 & 0 & 0 & \frac{t}{\sqrt{2}} & 0 & \frac{-\mathbf{i}}{2}\sqrt{\frac{3}{2}}\,t+\frac{t}{2\sqrt{2}} & 0 & 0 & \frac{\mathbf{i}}{2}\sqrt{\frac{3}{2}}\,t+\frac{t}{2\sqrt{2}} & \frac{-3\,t}{2}-\frac{\mathbf{i}}{2}\sqrt{3}\,t & -6\,\mu+2\,U
\end{array}\right]
$$