$$
K_{97}^2 \quad = \quad
\begin{bmatrix}
\frac{-3\,U}{t} & \frac{-U^2}{2\,t^2} & \frac{\frac{-\mathbf{i}}{2}\,\left(-\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & \frac{\frac{\mathbf{i}}{2}\,\sqrt{3}\,U}{t} & 0 & \frac{\left(3-\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & 0 & 0 & \frac{-\left(U+\mathbf{i}\,\sqrt{3}\,U\right)}{4\,t} & -\left(\frac{\sqrt{2}\,U}{t}\right) & 0 & \frac{U+\mathbf{i}\,\sqrt{3}\,U}{2\,t} & 0 & \frac{\left(3-\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} \\
\frac{-U^2}{2\,t^2} & \frac{-9\,U}{2\,t} & \frac{\left(1+\mathbf{i}\,\sqrt{3}\right)\,U}{\sqrt{2}\,t} & -1-\mathbf{i}\,\sqrt{3} & 0 & -2 & \frac{U+\mathbf{i}\,\sqrt{3}\,U}{2\,t} & \frac{-\left(U+\mathbf{i}\,\sqrt{3}\,U\right)}{2\,t} & -1-\mathbf{i}\,\sqrt{3} & 0 & \frac{U-\mathbf{i}\,\sqrt{3}\,U}{2\,t} & -1-\mathbf{i}\,\sqrt{3} & -\left(\frac{U}{t}\right) & 0 \\
\frac{\frac{\mathbf{i}}{2}\,\left(\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & \frac{\left(1-\mathbf{i}\,\sqrt{3}\right)\,U}{\sqrt{2}\,t} & \frac{-4\,U}{t} & 0 & \frac{\frac{\mathbf{i}}{2}\,\left(3\,\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & 0 & 0 & \frac{\sqrt{2}\,U+\mathbf{i}\,\sqrt{6}\,U}{4\,t} & 0 & 0 & \frac{\left(-1-\mathbf{i}\,\sqrt{3}\right)\,U}{\sqrt{2}\,t} & 0 & \frac{\frac{-\mathbf{i}}{2}\,\left(-\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & 0 \\
\frac{\frac{-\mathbf{i}}{2}\,\sqrt{3}\,U}{t} & -1+\mathbf{i}\,\sqrt{3} & 0 & \frac{-5\,U}{t} & \frac{-U^2}{2\,t^2} & \frac{\left(7+3\,\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & \frac{8\,t^2+\left(-1-\mathbf{i}\,\sqrt{3}\right)\,U^2}{4\,t^2} & 1+\mathbf{i}\,\sqrt{3} & \frac{U+\mathbf{i}\,\sqrt{3}\,U}{4\,t} & \frac{\frac{\mathbf{i}}{2}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & 0 & \frac{-\left(U+\mathbf{i}\,\sqrt{3}\,U\right)}{2\,t} & -1-\mathbf{i}\,\sqrt{3} & \frac{U+\mathbf{i}\,\sqrt{3}\,U}{4\,t} \\
0 & 0 & \frac{\frac{-\mathbf{i}}{2}\,\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & \frac{-U^2}{2\,t^2} & \frac{-4\,U}{t} & \frac{-U^2}{2\,t^2} & \frac{3\,\left(3+\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & \frac{\frac{\mathbf{i}}{4}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{t} & 0 & 0 & \frac{\frac{\mathbf{i}}{2}\,\sqrt{3}\,U}{t} & 0 & \frac{-\left(U+\mathbf{i}\,\sqrt{3}\,U\right)}{4\,t} & 0 \\
\frac{\left(3+\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & -2 & 0 & \frac{\left(7-3\,\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & \frac{-U^2}{2\,t^2} & \frac{-5\,U}{t} & 1+\mathbf{i}\,\sqrt{3}-\frac{U^2}{2\,t^2} & -1+\mathbf{i}\,\sqrt{3} & \frac{U}{2\,t} & -\left(\frac{U}{\sqrt{2}\,t}\right) & 0 & -\left(\frac{U}{t}\right) & 1-\mathbf{i}\,\sqrt{3} & \frac{-U}{2\,t} \\
0 & \frac{U-\mathbf{i}\,\sqrt{3}\,U}{2\,t} & 0 & \frac{8\,t^2+\mathbf{i}\,\left(\mathbf{i}+\sqrt{3}\right)\,U^2}{4\,t^2} & \frac{3\,\left(3-\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & 1-\mathbf{i}\,\sqrt{3}-\frac{U^2}{2\,t^2} & \frac{-5\,U}{t} & \frac{-U}{2\,t} & 2 & 0 & \frac{-\left(U+\mathbf{i}\,\sqrt{3}\,U\right)}{4\,t} & 2 & \frac{\frac{\mathbf{i}}{4}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{t} & 0 \\
0 & \frac{\frac{\mathbf{i}}{2}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{t} & \frac{\sqrt{2}\,U-\mathbf{i}\,\sqrt{6}\,U}{4\,t} & 1-\mathbf{i}\,\sqrt{3} & \frac{-\left(U+\mathbf{i}\,\sqrt{3}\,U\right)}{4\,t} & -1-\mathbf{i}\,\sqrt{3} & \frac{-U}{2\,t} & \frac{-4\,U}{t} & 1-\mathbf{i}\,\sqrt{3}-\frac{U^2}{2\,t^2} & 0 & \frac{\left(3-\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & 1-\mathbf{i}\,\sqrt{3} & \frac{\left(-1+5\,\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & \frac{\left(1+\mathbf{i}\,\sqrt{3}\right)\,U^2}{4\,t^2} \\
\frac{\frac{\mathbf{i}}{4}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{t} & -1+\mathbf{i}\,\sqrt{3} & 0 & \frac{U-\mathbf{i}\,\sqrt{3}\,U}{4\,t} & 0 & \frac{U}{2\,t} & 2 & 1+\mathbf{i}\,\sqrt{3}-\frac{U^2}{2\,t^2} & \frac{-4\,U}{t} & 0 & 0 & \frac{U}{t} & \frac{\left(-4-4\,\mathbf{i}\,\sqrt{3}\right)\,t^2+\mathbf{i}\,\left(\mathbf{i}+\sqrt{3}\right)\,U^2}{4\,t^2} & \frac{\frac{3\,\mathbf{i}}{2}\,\sqrt{3}\,U}{t} \\
-\left(\frac{\sqrt{2}\,U}{t}\right) & 0 & 0 & \frac{\frac{-\mathbf{i}}{2}\,\left(-\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & 0 & -\left(\frac{U}{\sqrt{2}\,t}\right) & 0 & 0 & 0 & \frac{-5\,U}{t} & \frac{\frac{\mathbf{i}}{2}\,\left(\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & \frac{\left(1+\mathbf{i}\,\sqrt{3}\right)\,U}{\sqrt{2}\,t} & 0 & \frac{\left(3-\mathbf{i}\,\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} \\
0 & \frac{U+\mathbf{i}\,\sqrt{3}\,U}{2\,t} & \frac{\mathbf{i}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & 0 & \frac{\frac{-\mathbf{i}}{2}\,\sqrt{3}\,U}{t} & 0 & \frac{\frac{\mathbf{i}}{4}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{t} & \frac{\left(3+\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & 0 & \frac{\frac{-\mathbf{i}}{2}\,\left(-\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & \frac{-6\,U}{t} & \frac{\frac{\mathbf{i}}{4}\,\left(\mathbf{i}+\sqrt{3}\right)\,U^2}{t^2} & \frac{\frac{\mathbf{i}}{4}\,\left(3\,\mathbf{i}+\sqrt{3}\right)\,U}{t} & 0 \\
\frac{U-\mathbf{i}\,\sqrt{3}\,U}{2\,t} & -1+\mathbf{i}\,\sqrt{3} & 0 & \frac{\frac{\mathbf{i}}{2}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{t} & 0 & -\left(\frac{U}{t}\right) & 2 & 1+\mathbf{i}\,\sqrt{3} & \frac{U}{t} & \frac{\left(1-\mathbf{i}\,\sqrt{3}\right)\,U}{\sqrt{2}\,t} & \frac{\frac{-\mathbf{i}}{4}\,\left(-\mathbf{i}+\sqrt{3}\right)\,U^2}{t^2} & \frac{-9\,U}{2\,t} & -1-\mathbf{i}\,\sqrt{3} & 0 \\
0 & -\left(\frac{U}{t}\right) & \frac{\frac{\mathbf{i}}{2}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & -1+\mathbf{i}\,\sqrt{3} & \frac{\frac{\mathbf{i}}{4}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{t} & 1+\mathbf{i}\,\sqrt{3} & \frac{-\left(U+\mathbf{i}\,\sqrt{3}\,U\right)}{4\,t} & \frac{-\left(U+5\,\mathbf{i}\,\sqrt{3}\,U\right)}{4\,t} & \frac{4\,\mathbf{i}\,\left(\mathbf{i}+\sqrt{3}\right)\,t^2+\left(-1-\mathbf{i}\,\sqrt{3}\right)\,U^2}{4\,t^2} & 0 & \frac{\frac{-\mathbf{i}}{4}\,\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U}{t} & -1+\mathbf{i}\,\sqrt{3} & \frac{-4\,U}{t} & \frac{-U^2}{2\,t^2} \\
\frac{\left(3+\mathbf{i}\,\sqrt{3}\right)\,U}{4\,t} & 0 & 0 & \frac{U-\mathbf{i}\,\sqrt{3}\,U}{4\,t} & 0 & \frac{-U}{2\,t} & 0 & \frac{\left(1-\mathbf{i}\,\sqrt{3}\right)\,U^2}{4\,t^2} & \frac{\frac{-3\,\mathbf{i}}{2}\,\sqrt{3}\,U}{t} & \frac{\left(3+\mathbf{i}\,\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & 0 & 0 & \frac{-U^2}{2\,t^2} & \frac{-5\,U}{t}
\end{bmatrix}
$$