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