$$
K_{89}^{1} = \begin{bmatrix}
0 & \frac{U}{t} & 0 & -1 & 0 & 0 & \frac{-\mathbf{i}}{2}\left(-\mathbf{i}+\sqrt{3}\right) & 0 & 0 & 0 & \frac{-\mathbf{i}}{2}\left(-\mathbf{i}+\sqrt{3}\right) & 0 & 0 & 0 & 0 & \frac{\mathbf{i}}{2}\left(3\,\mathbf{i}+\sqrt{3}\right) \\
-\left(\frac{U}{t}\right) & -\mathbf{i}\sqrt{3} & \frac{\mathbf{i}\left(3\,\mathbf{i}+\sqrt{3}\right)}{\sqrt{2}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{3+\mathbf{i}\sqrt{3}}{\sqrt{2}} & 0 & \frac{\mathbf{i}\left(\mathbf{i}+\sqrt{3}\right)U}{\sqrt{2}\,t} & 0 & 0 & \frac{\sqrt{2}\,U}{t} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 0 & \frac{\left(1+\mathbf{i}\sqrt{3}\right)U}{\sqrt{2}\,t} & 0 & \frac{U}{t} & \frac{\sqrt{2}\,U}{t} & \frac{-\mathbf{i}}{2}\left(-\mathbf{i}+\sqrt{3}\right) & \frac{-\left(U+\mathbf{i}\sqrt{3}\,U\right)}{2\,t} & \frac{\mathbf{i}\left(\mathbf{i}+\sqrt{3}\right)}{\sqrt{2}} & 0 & \frac{1+\mathbf{i}\sqrt{3}}{2} & 0 & 0 & 0 & 0 & \frac{-\mathbf{i}}{2}\left(-\mathbf{i}+\sqrt{3}\right) \\
0 & 0 & 0 & -\left(\frac{U}{t}\right) & 0 & 0 & \frac{U}{t} & \frac{\mathbf{i}}{2}\left(\mathbf{i}+\sqrt{3}\right) & 0 & \frac{\mathbf{i}}{2}\left(\mathbf{i}+\sqrt{3}\right) & 0 & 0 & \mathbf{i}\sqrt{3} & 0 & \frac{-\mathbf{i}}{2}\left(-\mathbf{i}+\sqrt{3}\right) & 0 \\
0 & 0 & 0 & -\left(\frac{\sqrt{2}\,U}{t}\right) & 0 & 0 & \frac{\sqrt{2}\,U}{t} & \frac{1-\mathbf{i}\sqrt{3}}{\sqrt{2}} & 0 & -\sqrt{2} & 0 & 0 & 0 & 0 & -\sqrt{2} & 0 \\
\frac{1-\mathbf{i}\sqrt{3}}{2} & 0 & -\left(\frac{\sqrt{2}\,U}{t}\right) & \frac{1-\mathbf{i}\sqrt{3}}{2} & -\left(\frac{U}{t}\right) & -\left(\frac{\sqrt{2}\,U}{t}\right) & 0 & \frac{U}{t} & -\sqrt{2} & 0 & -1 & 0 & 0 & 0 & 0 & -1 \\
0 & 0 & 0 & \frac{U-\mathbf{i}\sqrt{3}\,U}{2\,t} & \frac{1+\mathbf{i}\sqrt{3}}{2} & \frac{-1-\mathbf{i}\sqrt{3}}{\sqrt{2}} & -\left(\frac{U}{t}\right) & 0 & 0 & -1 & 0 & 0 & \frac{-\mathbf{i}}{2}\left(-\mathbf{i}+\sqrt{3}\right) & 0 & \frac{\mathbf{i}}{2}\left(\mathbf{i}+\sqrt{3}\right) & 0 \\
0 & 0 & 0 & \frac{1+\mathbf{i}\sqrt{3}}{\sqrt{2}} & 0 & 0 & \sqrt{2} & 0 & 0 & \frac{\sqrt{2}\,U}{t} & \frac{-1-\mathbf{i}\sqrt{3}}{\sqrt{2}} & 0 & 0 & 0 & \frac{\left(-1-\mathbf{i}\sqrt{3}\right)U}{\sqrt{2}\,t} & 0 \\
0 & 0 & 0 & 0 & \frac{1+\mathbf{i}\sqrt{3}}{2} & \sqrt{2} & 0 & 1 & -\left(\frac{\sqrt{2}\,U}{t}\right) & 0 & \frac{U}{t} & \frac{\mathbf{i}\left(\mathbf{i}+\sqrt{3}\right)U}{\sqrt{2}\,t} & \frac{-\mathbf{i}}{2}\left(-\mathbf{i}+\sqrt{3}\right) & 0 & \frac{1-\mathbf{i}\sqrt{3}}{2} & \frac{-\left(U+\mathbf{i}\sqrt{3}\,U\right)}{2\,t} \\
\frac{1-\mathbf{i}\sqrt{3}}{2} & 0 & 0 & \frac{\mathbf{i}}{2}\left(\mathbf{i}+\sqrt{3}\right) & 0 & 0 & 1 & 0 & \frac{1-\mathbf{i}\sqrt{3}}{\sqrt{2}} & -\left(\frac{U}{t}\right) & 0 & 0 & 0 & 0 & \frac{\frac{\mathbf{i}}{2}\left(\mathbf{i}+\sqrt{3}\right)U}{t} & -1 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\left(1+\mathbf{i}\sqrt{3}\right)U}{\sqrt{2}\,t} & 0 & 0 & 0 & \frac{\mathbf{i}\left(3\,\mathbf{i}+\sqrt{3}\right)}{\sqrt{2}} & \frac{\sqrt{2}\,U}{t} & 0 \\
0 & 0 & 0 & 0 & \mathbf{i}\sqrt{3} & 0 & 0 & \frac{1-\mathbf{i}\sqrt{3}}{2} & 0 & \frac{1-\mathbf{i}\sqrt{3}}{2} & 0 & 0 & 0 & \frac{U-\mathbf{i}\sqrt{3}\,U}{2\,t} & \frac{1+\mathbf{i}\sqrt{3}}{2} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{3+\mathbf{i}\sqrt{3}}{\sqrt{2}} & \frac{-\left(U+\mathbf{i}\sqrt{3}\,U\right)}{2\,t} & -\mathbf{i}\sqrt{3} & 0 & 0 \\
0 & 0 & 0 & 0 & \frac{1-\mathbf{i}\sqrt{3}}{2} & \sqrt{2} & 0 & \frac{1+\mathbf{i}\sqrt{3}}{2} & \frac{\left(1-\mathbf{i}\sqrt{3}\right)U}{\sqrt{2}\,t} & \frac{-\mathbf{i}}{2}\left(-\mathbf{i}+\sqrt{3}\right) & \frac{U+\mathbf{i}\sqrt{3}\,U}{2\,t} & -\left(\frac{\sqrt{2}\,U}{t}\right) & \frac{\mathbf{i}}{2}\left(\mathbf{i}+\sqrt{3}\right) & 0 & 0 & \frac{U}{t} \\
\frac{3+\mathbf{i}\sqrt{3}}{2} & 0 & 0 & \frac{1-\mathbf{i}\sqrt{3}}{2} & 0 & 0 & 1 & 0 & 0 & \frac{U-\mathbf{i}\sqrt{3}\,U}{2\,t} & 1 & 0 & 0 & 0 & -\left(\frac{U}{t}\right) & 0
\end{bmatrix}
$$