$$K_{142}^2 = \begin{bmatrix}
\frac{-53\,U}{12\,t} & \frac{\mathbf{i}}{24}\frac{\left(8\,(\mathbf{i}+\sqrt{3})\,t^2+(11\,\mathbf{i}+\sqrt{3})\,U^2\right)}{t^2} & 0 & \frac{-\left(\sqrt{2}\,(3\,\mathbf{i}+\sqrt{3})\right)}{3} & \frac{-6\,\mathbf{i}+\sqrt{3})\,U}{6\,\sqrt{2}\,t} & 0 & \frac{-((-3\,\mathbf{i}+\sqrt{3})\,U)}{12\,\sqrt{2}\,t} & \frac{-((-3\,\mathbf{i}+\sqrt{3})\,U)}{4\,\sqrt{2}\,t} & \sqrt{\frac{2}{3}}+\mathbf{i}\,\sqrt{2} & \frac{-2\,U}{\sqrt{3}\,t} & \frac{(-7-9\,\mathbf{i}\,\sqrt{3})\,U}{6\,\sqrt{2}\,t} & \frac{-8\,t^2+(1-\mathbf{i}\,\sqrt{3})\,U^2}{3\,\sqrt{2}\,t^2} & \frac{-((18\,\mathbf{i}+\sqrt{3})\,U)}{12\,t} & \frac{-\left(8\,(-3\,\mathbf{i}+\sqrt{3})\,t^2+(3\,\mathbf{i}+\sqrt{3})\,U^2\right)}{24\,t^2} \\
\frac{(-8-8\,\mathbf{i}\,\sqrt{3})\,t^2+(-11-\mathbf{i}\,\sqrt{3})\,U^2}{24\,t^2} & \frac{-19\,U}{4\,t} & \frac{-((3\,\mathbf{i}+\sqrt{3})\,U)}{4\,t} & \frac{-((3\,\mathbf{i}+2\,\sqrt{3})\,U)}{3\,\sqrt{2}\,t} & 0 & \frac{-\frac{\mathbf{i}}{2}\,U}{\sqrt{2}\,t} & \frac{-\frac{\mathbf{i}}{2}}{\sqrt{2}}+\frac{1}{\sqrt{6}} & \frac{-(3\,\mathbf{i}+\sqrt{3})}{3\,\sqrt{2}} & \frac{-((3\,\mathbf{i}+2\,\sqrt{3})\,U)}{6\,\sqrt{2}\,t} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U^2}{12\,t^2} & \frac{(4+4\,\mathbf{i}\,\sqrt{3})\,t^2+(1-\mathbf{i}\,\sqrt{3})\,U^2}{6\,\sqrt{2}\,t^2} & \frac{(5-\mathbf{i}\,\sqrt{3})\,U}{2\,\sqrt{2}\,t} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U^2}{8\,t^2} & \frac{-((3\,\mathbf{i}+2\,\sqrt{3})\,U)}{4\,t} \\
0 & \frac{-((-3\,\mathbf{i}+\sqrt{3})\,U)}{4\,t} & \frac{-4\,U}{t} & \frac{(1+\mathbf{i}\,\sqrt{3})\,U}{\sqrt{2}\,t} & -\left(\frac{U^2}{\sqrt{2}\,t^2}\right) & \frac{(3-\mathbf{i}\,\sqrt{3})\,U}{2\,\sqrt{2}\,t} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \frac{\frac{3}{4}\,\mathbf{i}\,(\mathbf{i}+\sqrt{3})\,U}{t} \\
\frac{-\left(\sqrt{2}\,(-3\,\mathbf{i}+\sqrt{3})\right)}{3} & \frac{(3\,\mathbf{i}-2\,\sqrt{3})\,U}{3\,\sqrt{2}\,t} & \frac{(1-\mathbf{i}\,\sqrt{3})\,U}{\sqrt{2}\,t} & \frac{-9\,U}{2\,t} & \frac{\frac{1}{4}\,(\mathbf{i}+\sqrt{3})\,U^2}{t^2} & 0 & -2 & -1+\mathbf{i}\,\sqrt{3} & \frac{U}{t} & 0 & -2\,\mathbf{i}+\frac{2}{\sqrt{3}} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U}{3\,t} & 0 & \frac{U}{\sqrt{2}\,t} \\
\frac{(6\,\mathbf{i}+\sqrt{3})\,U}{6\,\sqrt{2}\,t} & 0 & -\left(\frac{U^2}{\sqrt{2}\,t^2}\right) & \frac{-\frac{\mathbf{i}}{4}\,(-\mathbf{i}+\sqrt{3})\,U^2}{t^2} & \frac{-3\,U}{t} & 0 & \frac{(3+\mathbf{i}\,\sqrt{3})\,U}{4\,t} & \frac{(3+\mathbf{i}\,\sqrt{3})\,U}{4\,t} & 0 & \frac{(1+\mathbf{i}\,\sqrt{3})\,U}{\sqrt{2}\,t} & \frac{-((-3\,\mathbf{i}+\sqrt{3})\,U)}{6\,t} & 0 & \frac{3\,U}{2\,\sqrt{2}\,t} & 0 \\
0 & \frac{\frac{\mathbf{i}}{2}\,U}{\sqrt{2}\,t} & \frac{(3+\mathbf{i}\,\sqrt{3})\,U}{2\,\sqrt{2}\,t} & 0 & 0 & \frac{-4\,U}{t} & \frac{\frac{1}{4}\,(\mathbf{i}+\sqrt{3})\,U^2}{t^2} & \frac{U^2}{2\,t^2} & \frac{\frac{-3\,\mathbf{i}}{2}\,\sqrt{3}\,U}{t} & 0 & 0 & \frac{(\mathbf{i}+\sqrt{3})\,U}{2\,t} & 0 & \frac{-U}{2\,\sqrt{2}\,t} \\
\frac{-((3\,\mathbf{i}+\sqrt{3})\,U)}{12\,\sqrt{2}\,t} & \frac{\mathbf{i}}{\sqrt{2}}+\frac{1}{\sqrt{6}} & 0 & -2 & \frac{(3-\mathbf{i}\,\sqrt{3})\,U}{4\,t} & \frac{\frac{-\mathbf{i}}{4}\,(-\mathbf{i}+\sqrt{3})\,U^2}{t^2} & \frac{-5\,U}{t} & \frac{\frac{-\mathbf{i}}{2}\,(-4\,\mathbf{i}+\sqrt{3})\,U}{t} & \frac{8\,t^2+\mathbf{i}\,(\mathbf{i}+\sqrt{3})\,U^2}{4\,t^2} & \frac{U}{\sqrt{2}\,t} & \frac{-((3\,\mathbf{i}+\sqrt{3})\,U)}{6\,t} & 2\,\mathbf{i}-\frac{2}{\sqrt{3}} & \frac{3\,(1+\mathbf{i}\,\sqrt{3})\,U}{4\,\sqrt{2}\,t} & \frac{1+\mathbf{i}\,\sqrt{3}}{\sqrt{2}} \\
\frac{-((3\,\mathbf{i}+\sqrt{3})\,U)}{4\,\sqrt{2}\,t} & \frac{\mathbf{i}}{\sqrt{2}}-\frac{1}{\sqrt{6}} & 0 & -1-\mathbf{i}\,\sqrt{3} & \frac{(3-\mathbf{i}\,\sqrt{3})\,U}{4\,t} & \frac{U^2}{2\,t^2} & \frac{\frac{1}{2}\,(4\,\mathbf{i}+\sqrt{3})\,U}{t} & \frac{-5\,U}{t} & \frac{(4+4\,\mathbf{i}\,\sqrt{3})\,t^2+(1-\mathbf{i}\,\sqrt{3})\,U^2}{4\,t^2} & \frac{\sqrt{2}\,U+\mathbf{i}\,\sqrt{6}\,U}{4\,t} & 0 & \frac{-4}{\sqrt{3}} & \frac{\frac{-3}{4}\,\mathbf{i}\,(-\mathbf{i}+\sqrt{3})\,U}{\sqrt{2}\,t} & \frac{\mathbf{i}\,(\mathbf{i}+\sqrt{3})}{\sqrt{2}} \\
\sqrt{\frac{2}{3}}-\mathbf{i}\,\sqrt{2} & \frac{(3\,\mathbf{i}-2\,\sqrt{3})\,U}{6\,\sqrt{2}\,t} & 0 & \frac{U}{t} & 0 & \frac{3}{2}\frac{\mathbf{i}}{\sqrt{3}}\,U & \frac{8\,t^2+(-1-\mathbf{i}\,\sqrt{3})\,U^2}{4\,t^2} & \frac{(4-4\,\mathbf{i}\,\sqrt{3})\,t^2+(1+\mathbf{i}\,\sqrt{3})\,U^2}{4\,t^2} & \frac{-5\,U}{t} & 0 & 2\,\mathbf{i}-\frac{2}{\sqrt{3}} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U}{6\,t} & 0 & \frac{U}{2\,\sqrt{2}\,t} \\
\frac{-2\,U}{\sqrt{3}\,t} & \frac{(3\,\mathbf{i}+\sqrt{3})\,U^2}{12\,t^2} & 0 & 0 & \frac{(1-\mathbf{i}\,\sqrt{3})\,U}{\sqrt{2}\,t} & 0 & \frac{U}{\sqrt{2}\,t} & \frac{\sqrt{2}\,U-\mathbf{i}\,\sqrt{6}\,U}{4\,t} & 0 & \frac{-5\,U}{t} & \frac{-((9\,\mathbf{i}+\sqrt{3})\,U)}{6\,\sqrt{2}\,t} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U^2}{6\,\sqrt{2}\,t^2} & \frac{\mathbf{i}}{2}\frac{(\mathbf{i}+\sqrt{3})\,U}{t} & \frac{(1+\mathbf{i}\,\sqrt{3})\,U^2}{4\,t^2} \\
\frac{(-7+9\,\mathbf{i}\,\sqrt{3})\,U}{6\,\sqrt{2}\,t} & \frac{(4-4\,\mathbf{i}\,\sqrt{3})\,t^2+(1+\mathbf{i}\,\sqrt{3})\,U^2}{6\,\sqrt{2}\,t^2} & 0 & 2\,\mathbf{i}+\frac{2}{\sqrt{3}} & \frac{-((3\,\mathbf{i}+\sqrt{3})\,U)}{6\,t} & 0 & \frac{-((-3\,\mathbf{i}+\sqrt{3})\,U)}{6\,t} & 0 & \frac{-2\,(3\,\mathbf{i}+\sqrt{3})}{3} & \frac{-((-9\,\mathbf{i}+\sqrt{3})\,U)}{6\,\sqrt{2}\,t} & \frac{-23\,U}{6\,t} & \frac{16\,t^2+(-2-\mathbf{i}\,\sqrt{3})\,U^2}{6\,t^2} & \frac{(-9\,\mathbf{i}+\sqrt{3})\,U}{6\,\sqrt{2}\,t} & \frac{4\,(-3\,\mathbf{i}+\sqrt{3})\,t^2-(3\,\mathbf{i}+\sqrt{3})\,U^2}{6\,\sqrt{2}\,t^2} \\
\frac{-8\,t^2+(1+\mathbf{i}\,\sqrt{3})\,U^2}{3\,\sqrt{2}\,t^2} & \frac{(5+\mathbf{i}\,\sqrt{3})\,U}{2\,\sqrt{2}\,t} & 0 & \frac{(3\,\mathbf{i}+\sqrt{3})\,U}{3\,t} & 0 & \frac{(-\mathbf{i}+\sqrt{3})\,U}{2\,t} & \frac{-2\,(3\,\mathbf{i}+\sqrt{3})}{3} & \frac{-4}{\sqrt{3}} & \frac{(3\,\mathbf{i}+\sqrt{3})\,U}{6\,t} & \frac{(3\,\mathbf{i}+\sqrt{3})\,U^2}{6\,\sqrt{2}\,t^2} & \frac{16\,t^2+\mathbf{i}\,(2\,\mathbf{i}+\sqrt{3})\,U^2}{6\,t^2} & \frac{-7\,U}{2\,t} & 0 & \frac{-((3\,\mathbf{i}+\sqrt{3})\,U)}{2\,\sqrt{2}\,t} \\
\frac{-((-18\,\mathbf{i}+\sqrt{3})\,U)}{12\,t} & \frac{(3\,\mathbf{i}+\sqrt{3})\,U^2}{8\,t^2} & 0 & 0 & \frac{3\,U}{2\,\sqrt{2}\,t} & 0 & \frac{3\,(1-\mathbf{i}\,\sqrt{3})\,U}{4\,\sqrt{2}\,t} & \frac{\frac{3}{4}\,\mathbf{i}\,(\mathbf{i}+\sqrt{3})\,U}{\sqrt{2}\,t} & 0 & \frac{-(U+\mathbf{i}\,\sqrt{3}\,U)}{2\,t} & \frac{(9\,\mathbf{i}+\sqrt{3})\,U}{6\,\sqrt{2}\,t} & 0 & \frac{-21\,U}{4\,t} & \frac{\mathbf{i}}{8}\frac{(3\,\mathbf{i}+\sqrt{3})\,U^2}{t^2} \\
\frac{-\left(8\,(3\,\mathbf{i}+\sqrt{3})\,t^2+(-3\,\mathbf{i}+\sqrt{3})\,U^2\right)}{24\,t^2} & \frac{(3\,\mathbf{i}-2\,\sqrt{3})\,U}{4\,t} & \frac{\frac{-3}{4}\,\mathbf{i}\,(-\mathbf{i}+\sqrt{3})\,U}{t} & \frac{U}{\sqrt{2}\,t} & 0 & \frac{-U}{2\,\sqrt{2}\,t} & \frac{1-\mathbf{i}\,\sqrt{3}}{\sqrt{2}} & \frac{-1-\mathbf{i}\,\sqrt{3}}{\sqrt{2}} & \frac{U}{2\,\sqrt{2}\,t} & \frac{(1-\mathbf{i}\,\sqrt{3})\,U^2}{4\,t^2} & \frac{4\,(3\,\mathbf{i}+\sqrt{3})\,t^2-(-3\,\mathbf{i}+\sqrt{3})\,U^2}{6\,\sqrt{2}\,t^2} & \frac{-((-3\,\mathbf{i}+\sqrt{3})\,U)}{2\,\sqrt{2}\,t} & \frac{-\mathbf{i}}{8}\frac{(-3\,\mathbf{i}+\sqrt{3})\,U^2}{t^2} & \frac{-23\,U}{4\,t}
\end{bmatrix}$$