$$K_{140}^2 \;=\; \begin{bmatrix}
\frac{-35\,U}{12\,t} & \frac{48\,t^2+(7-5\,\mathbf{i}\,\sqrt{3})\,U^2}{24\,t^2} & \frac{-\left((-3\,\mathbf{i}+\sqrt{3})\,U\right)}{12\,\sqrt{2}\,t} & \frac{3\,\mathbf{i}+\sqrt{3}}{2} & \frac{(9\,\mathbf{i}+\sqrt{3})\,U}{8\,t} & \frac{-\left((3\,\mathbf{i}+5\,\sqrt{3})\,U^2\right)}{12\,\sqrt{2}\,t^2} & \frac{(9\,\mathbf{i}-5\,\sqrt{3})\,U^2}{12\,\sqrt{2}\,t^2} & \frac{\sqrt{2}\,U-\mathbf{i}\,\sqrt{6}\,U}{8\,t} & \frac{3\,(1+\mathbf{i}\,\sqrt{3})}{2} & \frac{-(U+3\,\mathbf{i}\,\sqrt{3}\,U)}{8\,t} & \frac{(17+\mathbf{i}\,\sqrt{3})\,U}{6\,\sqrt{2}\,t} & \frac{-(12\,t^2+(1+\mathbf{i}\,\sqrt{3})\,U^2)}{3\,\sqrt{2}\,t^2} & \frac{\left(\frac{1}{4}-\frac{\mathbf{i}}{4}\right)\left(-9\,\sqrt{4-2\,\sqrt{3}}+(4+\mathbf{i})\,(-3+\sqrt{3})\right)\,U}{\sqrt{3}\,(3-\sqrt{3})^{\frac{3}{2}}\,t} & \frac{(-9-9\,\mathbf{i}+(5+3\,\mathbf{i})\,\sqrt{3})\,U}{12\,\sqrt{3+\sqrt{3}}\,t} & \frac{(-5\,\mathbf{i}+2\,\sqrt{3})\,U}{24\,t^2} & \frac{-\left((3\,\mathbf{i}+\sqrt{3})\,U^2\right)}{24\,t^2} \\
\frac{48\,t^2+(7+5\,\mathbf{i}\,\sqrt{3})\,U^2}{24\,t^2} & \frac{-31\,U}{12\,t} & 0 & \frac{(9\,\mathbf{i}-2\,\sqrt{3})\,U}{12\,t} & \mathbf{i}+\frac{1}{\sqrt{3}} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U}{6\,\sqrt{2}\,t} & \frac{(6\,\mathbf{i}-5\,\sqrt{3})\,U}{3\,\sqrt{2}\,t} & 0 & \frac{-U}{4\,t} & -1-\mathbf{i}\,\sqrt{3} & \frac{(1+\mathbf{i}\,\sqrt{3})\,U^2}{6\,\sqrt{2}\,t^2} & \frac{(-5+3\,\mathbf{i}\,\sqrt{3})\,U}{6\,\sqrt{2}\,t} & 0 & 0 & \frac{-16\,\sqrt{3}\,t^2+3\,(-3\,\mathbf{i}+\sqrt{3})\,U^2}{24\,t^2} & \frac{-\left((-2\,\mathbf{i}+\sqrt{3})\,U\right)}{4\,t} \\
\frac{-\left((3\,\mathbf{i}+\sqrt{3})\,U\right)}{12\,\sqrt{2}\,t} & 0 & \frac{-2\,U}{t} & \frac{-\frac{\mathbf{i}}{4}\,(-5\,\mathbf{i}+\sqrt{3})\,U^2}{\sqrt{2}\,t^2} & \frac{\sqrt{2}\,U-\mathbf{i}\,\sqrt{6}\,U}{4\,t} & -2 & -1-\mathbf{i}\,\sqrt{3} & 0 & \frac{(3\,\mathbf{i}+\sqrt{3})\,U^2}{4\,\sqrt{2}\,t^2} & 0 & \frac{U}{\sqrt{3}\,t} & 0 & 0 & 0 & \frac{3\,(1+\mathbf{i}\,\sqrt{3})\,U}{4\,\sqrt{2}\,t} & 0 \\
\frac{-3\,\mathbf{i}+\sqrt{3}}{2} & \frac{-\left((9\,\mathbf{i}+2\,\sqrt{3})\,U\right)}{12\,t} & \frac{\frac{\mathbf{i}}{4}\,(5\,\mathbf{i}+\sqrt{3})\,U^2}{\sqrt{2}\,t^2} & \frac{-15\,U}{4\,t} & \frac{8\,t^2+(-1-3\,\mathbf{i}\,\sqrt{3})\,U^2}{8\,t^2} & \frac{3\,U}{2\,\sqrt{2}\,t} & \frac{3\,U}{2\,\sqrt{2}\,t} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U^2}{4\,\sqrt{2}\,t^2} & \frac{\frac{3\,\mathbf{i}}{4}\,U}{t} & \frac{-\left(8\,\sqrt{3}\,t^2+(-3\,\mathbf{i}+\sqrt{3})\,U^2\right)}{8\,t^2} & 0 & \frac{U}{\sqrt{6}\,t} & 0 & 0 & \frac{\mathbf{i}}{2}\,\left(\mathbf{i}+\sqrt{3}\right) & \frac{-3\,\mathbf{i}}{4}\,(-2\,\mathbf{i}+\sqrt{3})\,U}{t} \\
\frac{(-9\,\mathbf{i}+\sqrt{3})\,U}{8\,t} & -\mathbf{i}+\frac{1}{\sqrt{3}} & \frac{\sqrt{2}\,U+\mathbf{i}\,\sqrt{6}\,U}{4\,t} & \frac{8\,t^2+(-1+3\,\mathbf{i}\,\sqrt{3})\,U^2}{8\,t^2} & \frac{-3\,U}{4\,t} & 0 & 0 & 0 & \frac{8\,\sqrt{3}\,t^2-(3\,\mathbf{i}+\sqrt{3})\,U^2}{8\,t^2} & \frac{-5\,\sqrt{3}\,U}{4\,t} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U}{2\,\sqrt{2}\,t} & \frac{-\left(\sqrt{2}\,(-3\,\mathbf{i}+\sqrt{3})\right)}{3} & 0 & 0 & \frac{-3\,\mathbf{i}}{8}\,(-\mathbf{i}+\sqrt{3})\,U}{t} & 0 \\
\frac{(3\,\mathbf{i}-5\,\sqrt{3})\,U^2}{12\,\sqrt{2}\,t^2} & \frac{(3\,\mathbf{i}+\sqrt{3})\,U}{6\,\sqrt{2}\,t} & -2 & \frac{3\,U}{2\,\sqrt{2}\,t} & 0 & \frac{-4\,U}{t} & \frac{U}{t} & -2\,\sqrt{3} & \frac{-\left(\sqrt{\frac{3}{2}}\,U\right)}{2\,t} & 0 & -\left(\frac{U^2}{\sqrt{3}\,t^2}\right) & \frac{(3\,\mathbf{i}+4\,\sqrt{3})\,U}{3\,t} & \frac{-4\,(-3+\sqrt{3})}{\sqrt{18-6\,\sqrt{3}}} & \frac{2\,(\sqrt{2}+\sqrt{6})}{\sqrt{3}+\sqrt{3}} & \frac{(3+\mathbf{i}\,\sqrt{3})\,U^2}{4\,\sqrt{2}\,t^2} & \frac{(2+\mathbf{i}\,\sqrt{3})\,U}{\sqrt{2}\,t} \\
\frac{-\left((9\,\mathbf{i}+5\,\sqrt{3})\,U^2\right)}{12\,\sqrt{2}\,t^2} & \frac{-\left((6\,\mathbf{i}+5\,\sqrt{3})\,U\right)}{3\,\sqrt{2}\,t} & -1+\mathbf{i}\,\sqrt{3} & \frac{3\,U}{2\,\sqrt{2}\,t} & 0 & \frac{U}{t} & \frac{-4\,U}{t} & 3\,\mathbf{i}-\sqrt{3} & \frac{-\left(\sqrt{\frac{3}{2}}\,U\right)}{2\,t} & 0 & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U^2}{6\,t^2} & \frac{(3\,\mathbf{i}+\sqrt{3})\,U}{6\,t} & \frac{(-2-6\,\mathbf{i})\,\sqrt{18-6\,\sqrt{3}}+(6+6\,\mathbf{i})\,\sqrt{6-2\,\sqrt{3}}}{6\,\sqrt{4-2\,\sqrt{3}}} & (1-\mathbf{i})\,\left(2-\mathbf{i}+\sqrt{3}\right)\,\sqrt{\frac{2}{3+\sqrt{3}}} & \frac{\mathbf{i}}{2}\,(\mathbf{i}+\sqrt{3})\,U^2}{\sqrt{2}\,t^2} & \frac{(5+\mathbf{i}\,\sqrt{3})\,U}{2\,\sqrt{2}\,t} \\
\frac{\sqrt{2}\,U+\mathbf{i}\,\sqrt{6}\,U}{8\,t} & 0 & 0 & \frac{(3\,\mathbf{i}+\sqrt{3})\,U^2}{4\,\sqrt{2}\,t^2} & 0 & -2\,\sqrt{3} & -3\,\mathbf{i}-\sqrt{3} & \frac{-6\,U}{t} & \frac{\mathbf{i}}{2}\,(3\,\mathbf{i}+\sqrt{3})\,U^2}{\sqrt{2}\,t^2} & \frac{3\,(1-\mathbf{i}\,\sqrt{3})\,U}{2\,\sqrt{2}\,t} & -\left(\frac{U}{t}\right) & 0 & 0 & 0 & \frac{-3\,(3\,\mathbf{i}+\sqrt{3})\,U}{4\,\sqrt{2}\,t} & 0 \\
\frac{3\,(1-\mathbf{i}\,\sqrt{3})}{2} & \frac{-U}{4\,t} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U^2}{4\,\sqrt{2}\,t^2} & \frac{-\frac{3}{2}\mathbf{i}\,U}{t} & \frac{8\,\sqrt{3}\,t^2-(-3\,\mathbf{i}+\sqrt{3})\,U^2}{8\,t^2} & \frac{-\left(\sqrt{\frac{3}{2}}\,U\right)}{2\,t} & \frac{-\left(\sqrt{\frac{3}{2}}\,U\right)}{2\,t} & \frac{-\frac{\mathbf{i}}{4}\,(-3\,\mathbf{i}+\sqrt{3})\,U^2}{\sqrt{2}\,t^2} & \frac{-15\,U}{4\,t} & \frac{-\left(24\,t^2+(3+\mathbf{i}\,\sqrt{3})\,U^2\right)}{8\,t^2} & 0 & -\left(\frac{U}{\sqrt{2}\,t}\right) & 0 & 0 & \frac{3\,\mathbf{i}-\sqrt{3}}{2} & \frac{3\,\sqrt{3}\,U}{4\,t} \\
\frac{(-1+3\,\mathbf{i}\,\sqrt{3})\,U}{8\,t} & -1+\mathbf{i}\,\sqrt{3} & 0 & \frac{-\left(8\,\sqrt{3}\,t^2+(3\,\mathbf{i}+\sqrt{3})\,U^2\right)}{8\,t^2} & \frac{-5\,\sqrt{3}\,U}{4\,t} & 0 & 0 & \frac{3\,(1+\mathbf{i}\,\sqrt{3})\,U}{2\,\sqrt{2}\,t} & \frac{-24\,t^2+\mathbf{i}\,(3\,\mathbf{i}+\sqrt{3})\,U^2}{8\,t^2} & \frac{-21\,U}{4\,t} & \frac{\mathbf{i}}{2}\,(\mathbf{i}+\sqrt{3})\,U}{\sqrt{2}\,t} & \sqrt{2}-\mathbf{i}\,\sqrt{6} & 0 & 0 & \frac{(3+\mathbf{i}\,\sqrt{3})\,U}{8\,t} & 0 \\
\frac{(17-\mathbf{i}\,\sqrt{3})\,U}{6\,\sqrt{2}\,t} & \frac{(1-\mathbf{i}\,\sqrt{3})\,U^2}{6\,\sqrt{2}\,t^2} & \frac{U}{\sqrt{3}\,t} & 0 & \frac{(3\,\mathbf{i}+\sqrt{3})\,U}{2\,\sqrt{2}\,t} & -\left(\frac{t^2}{\sqrt{3}\,t^2}\right) & \frac{(3\,\mathbf{i}+\sqrt{3})\,U^2}{6\,t^2} & -\left(\frac{U}{t}\right) & 0 & \frac{-\frac{\mathbf{i}}{2}\,(-\mathbf{i}+\sqrt{3})\,U}{\sqrt{2}\,t} & \frac{-23\,U}{6\,t} & \frac{-\frac{\mathbf{i}}{12}\,(-5\,\mathbf{i}+\sqrt{3})\,U^2}{t^2} & -\left(\frac{(-3-6\,\mathbf{i}+\sqrt{3})\,U}{\sqrt{6}\,(3-\sqrt{3})^{\frac{3}{2}}\,t}\right) & \frac{\mathbf{i}}{4}\,(-3+(3+\mathbf{i})\,\sqrt{3})\,U}{\sqrt{2}\,(3+\sqrt{3})\,t} & \frac{-\left((1+\mathbf{i}\,\sqrt{3})\,U\right)}{2\,\sqrt{2}\,t} & \frac{-\left((-3\,\mathbf{i}+\sqrt{3})\,U^2\right)}{6\,\sqrt{2}\,t^2} \\
\frac{-\left(12\,t^2+(-\mathbf{i}+\sqrt{3})\,U^2\right)}{3\,\sqrt{2}\,t^2} & \frac{(-5-3\,\mathbf{i}\,\sqrt{3})\,U}{6\,\sqrt{2}\,t} & 0 & \frac{U}{\sqrt{6}\,t} & \frac{-\left(\sqrt{2}\,(3\,\mathbf{i}+\sqrt{3})\right)}{3} & \frac{(-3\,\mathbf{i}+4\,\sqrt{3})\,U}{3\,t} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U}{6\,t} & 0 & -\left(\frac{U}{\sqrt{2}\,t}\right) & \sqrt{2}+\mathbf{i}\,\sqrt{6} & \frac{\frac{\mathbf{i}}{12}\,(5\,\mathbf{i}+\sqrt{3})\,U^2}{t^2} & \frac{-13\,U}{6\,t} & 0 & 0 & 2\,\sqrt{\frac{2}{3}} & \frac{(\mathbf{i}+\sqrt{3})\,U}{2\,\sqrt{2}\,t} \\
\frac{\left(-\left(\frac{1}{4}\right)-\frac{\mathbf{i}}{4}\right)\,\left(9\,\sqrt{4-2\,\sqrt{3}}-(4-\mathbf{i})\,(-3+\sqrt{3})\right)\,U}{\sqrt{3}\,(3-\sqrt{3})^{\frac{3}{2}}\,t} & 0 & 0 & 0 & 0 & \frac{-4\,(-3+\sqrt{3})}{\sqrt{18-6\,\sqrt{3}}} & \frac{(-2+6\,\mathbf{i})\,\sqrt{18-6\,\sqrt{3}}+(6-6\,\mathbf{i})\,\sqrt{6-2\,\sqrt{3}}}{6\,\sqrt{4-2\,\sqrt{3}}} & 0 & 0 & 0 & -\left(\frac{(-3+6\,\mathbf{i}+\sqrt{3})\,U}{\sqrt{6}\,(3-\sqrt{3})^{\frac{3}{2}}\,t}\right) & 0 & \frac{-2\left(-9+2\,\sqrt{3}+12\,\sqrt{4-2\,\sqrt{3}}\right)\,U}{\sqrt{4-2\,\sqrt{3}}\,(-3+\sqrt{3})^2\,t} & \frac{-\left(\left(-3+\sqrt{3}-3\,\sqrt{4-2\,\sqrt{3}}\right)\,U\right)}{6\,\sqrt{2}\,t} & \frac{\frac{\mathbf{i}}{10}\left(36-12\,\mathbf{i}\right)\,\sqrt{4-2\,\sqrt{3}}-(36+12\,\mathbf{i})\,(-3+\sqrt{3})\right)\,U}{\sqrt{3}\,(3-\sqrt{3})^{\frac{3}{2}}\,t} & 0 \\
\frac{\left(\frac{1}{12}-\frac{\mathbf{i}}{12}\right)\,(-9+(4+\mathbf{i})\,\sqrt{3})\,U}{\sqrt{3+\sqrt{3}}\,t} & 0 & 0 & 0 & 0 & \frac{2\,(\sqrt{2}+\sqrt{6})}{\sqrt{3}+\sqrt{3}} & (1+\mathbf{i})\,\left(2+\mathbf{i}+\sqrt{3}\right)\,\sqrt{\frac{2}{3+\sqrt{3}}} & 0 & 0 & 0 & \frac{-\left((-3\,\mathbf{i}+(1+3\,\mathbf{i})\,\sqrt{3})\,U\right)}{3\,\sqrt{2}\,(3+\sqrt{3})\,t} & 0 & \frac{-\left(\left(-3+\sqrt{3}-3\,\sqrt{4-2\,\sqrt{3}}\right)\,U\right)}{6\,\sqrt{2}\,t} & \frac{-7\,U}{(3+\sqrt{3})\,t} & \frac{(-1+3\,\mathbf{i}-(1+3\,\mathbf{i})\,\sqrt{3})\,U}{4\,\sqrt{3+\sqrt{3}}\,t} & 0 \\
\frac{(5\,\mathbf{i}+2\,\sqrt{3})\,U}{4\,t} & \frac{-16\,\sqrt{3}\,t^2+3\,\left(3\,\mathbf{i}+\sqrt{3}\right)\,U^2}{24\,t^2} & \frac{3\,(1-\mathbf{i}\,\sqrt{3})\,U}{4\,\sqrt{2}\,t} & \frac{-\mathbf{i}}{2}\,\left(-\mathbf{i}+\sqrt{3}\right) & \frac{3\mathbf{i}}{4}\,(\mathbf{i}+\sqrt{3})\,U}{t} & \frac{(3-\mathbf{i}\,\sqrt{3})\,U^2}{4\,\sqrt{2}\,t^2} & \frac{-\mathbf{i}}{4}\,(-\mathbf{i}+\sqrt{3})\,U^2}{\sqrt{2}\,t^2} & \frac{-3\,(-3\,\mathbf{i}+\sqrt{3})\,U}{4\,\sqrt{2}\,t} & \frac{-3\,\mathbf{i}-\sqrt{3}}{2} & \frac{(-3\,\mathbf{i}+\sqrt{3})\,U}{8\,t} & \frac{-\left((-\mathbf{i}+\sqrt{3})\,U\right)}{2\,\sqrt{2}\,t} & 2\,\sqrt{\frac{2}{3}} & \left(\frac{1}{4}+\frac{\mathbf{i}}{4}\right)\,\sqrt{3}\,\left((-1-2\,\mathbf{i})\,\sqrt{4-2\,\sqrt{3}}+(2+\mathbf{i})\,(-3+\sqrt{3})\right)\,U}{(3-\sqrt{3})^{\frac{3}{2}}\,t} & \frac{(-1-3\,\mathbf{i}-(1-3\,\mathbf{i})\,\sqrt{3})\,U}{4\,\sqrt{3+\sqrt{3}}\,t} & \frac{-21\,U}{4\,t} & \frac{(3-\mathbf{i}\,\sqrt{3})\,U^2}{8\,t^2} \\
\frac{-\left((-3\,\mathbf{i}+\sqrt{3})\,U^2\right)}{24\,t^2} & \frac{-\left((2\,\mathbf{i}+\sqrt{3})\,U\right)}{4\,t} & 0 & \frac{\mathbf{i}}{4}\,(2\,\mathbf{i}+\sqrt{3})\,U}{t} & 0 & \frac{(2-\mathbf{i}\,\sqrt{3})\,U}{\sqrt{2}\,t} & \frac{(5-\mathbf{i}\,\sqrt{3})\,U}{2\,\sqrt{2}\,t} & 0 & \frac{3\,\sqrt{3}\,U}{4\,t} & 0 & \frac{-\left((3\,\mathbf{i}+\sqrt{3})\,U^2\right)}{6\,\sqrt{2}\,t^2} & \frac{(-\mathbf{i}+\sqrt{3})\,U}{2\,\sqrt{2}\,t} & 0 & 0 & \frac{(3+\mathbf{i}\,\sqrt{3})\,U^2}{8\,t^2} & \frac{-15\,U}{4\,t}
\end{bmatrix}$$