$$K^2_{122} = \begin{bmatrix}
\frac{-11\,U}{2\,t} & \frac{8\,t^2-U^2}{2\,\sqrt{3}\,t^2} & 0 & 2\,\sqrt{2} & -\left(\frac{U}{\sqrt{2}\,t}\right) & \frac{-U}{2\,t} & -2\,\sqrt{2} & \frac{-2\,U}{t} & -\left(\frac{\sqrt{\frac{2}{3}}\left(4\,t^2+U^2\right)}{t^2}\right) & \frac{-5\,U}{2\,t} \\
\frac{8\,t^2-U^2}{2\,\sqrt{3}\,t^2} & \frac{-11\,U}{2\,t} & \frac{\sqrt{3}\,U}{t} & \frac{\sqrt{\frac{2}{3}}\,U}{t} & 0 & \frac{-4}{\sqrt{3}} & \frac{U}{\sqrt{6}\,t} & \frac{2\,U^2}{\sqrt{3}\,t^2} & \frac{\sqrt{2}\,U}{t} & \frac{-\left(\sqrt{3}\,U^2\right)}{2\,t^2} \\
0 & \frac{\sqrt{3}\,U}{t} & \frac{-4\,U}{t} & \frac{2\,\sqrt{2}\,U}{t} & \frac{\sqrt{2}\,U^2}{t^2} & 0 & 0 & 0 & 0 & 0 \\
2\,\sqrt{2} & \frac{\sqrt{\frac{2}{3}}\,U}{t} & \frac{2\,\sqrt{2}\,U}{t} & 0 & -\left(\frac{U^2}{t^2}\right) & -2\,\sqrt{2} & \frac{U}{t} & 0 & \frac{4\,U}{\sqrt{3}\,t} & 0 \\
-\left(\frac{U}{\sqrt{2}\,t}\right) & 0 & \frac{\sqrt{2}\,U^2}{t^2} & -\left(\frac{U^2}{t^2}\right) & \frac{-6\,U}{t} & \frac{-3\,U}{\sqrt{2}\,t} & 0 & -\left(\frac{\sqrt{2}\,U}{t}\right) & 0 & \frac{-3\,U}{\sqrt{2}\,t} \\
\frac{-U}{2\,t} & \frac{-4}{\sqrt{3}} & 0 & -2\,\sqrt{2} & \frac{-3\,U}{\sqrt{2}\,t} & \frac{-9\,U}{2\,t} & \frac{4\,t^2+U^2}{\sqrt{2}\,t^2} & \frac{U}{t} & 4\,\sqrt{\frac{2}{3}} & \frac{-3\,U}{2\,t} \\
-2\,\sqrt{2} & \frac{U}{\sqrt{6}\,t} & 0 & \frac{U}{t} & 0 & \frac{4\,t^2+U^2}{\sqrt{2}\,t^2} & \frac{-5\,U}{t} & 0 & \frac{2\,U}{\sqrt{3}\,t} & 0 \\
\frac{-2\,U}{t} & \frac{2\,U^2}{\sqrt{3}\,t^2} & 0 & 0 & -\left(\frac{\sqrt{2}\,U}{t}\right) & \frac{U}{t} & 0 & \frac{-5\,U}{t} & \frac{\sqrt{\frac{2}{3}}\,U^2}{t^2} & \frac{-2\,U}{t} \\
-\left(\frac{\sqrt{\frac{2}{3}}\left(4\,t^2+U^2\right)}{t^2}\right) & \frac{\sqrt{2}\,U}{t} & 0 & \frac{4\,U}{\sqrt{3}\,t} & 0 & 4\,\sqrt{\frac{2}{3}} & \frac{2\,U}{\sqrt{3}\,t} & \frac{\sqrt{\frac{2}{3}}\,U^2}{t^2} & \frac{-2\,U}{t} & 0 \\
\frac{-5\,U}{2\,t} & \frac{-\left(\sqrt{3}\,U^2\right)}{2\,t^2} & 0 & 0 & \frac{-3\,U}{\sqrt{2}\,t} & \frac{-3\,U}{2\,t} & 0 & \frac{-2\,U}{t} & 0 & \frac{-15\,U}{2\,t}
\end{bmatrix}$$