$$K_{31}^2 = \begin{bmatrix}
\frac{-3\,U}{t} & -4 & \frac{U}{t} & 0 & -\left(\frac{\sqrt{2}\,U}{t}\right) & 0 & \frac{\left(1-\sqrt{\frac{2}{11}}\right)U^2}{\sqrt{2-2\,\sqrt{\frac{2}{11}}}\,t^2} & \frac{-\left(\left(11+\sqrt{22}\right)U^2\right)}{11\,\sqrt{2+2\,\sqrt{\frac{2}{11}}}\,t^2} \\
-4 & \frac{-6\,U}{t} & \frac{U^2}{t^2} & 0 & 0 & 0 & \frac{\left(11\,\sqrt{4-4\,\sqrt{\frac{2}{11}}}+14\,\sqrt{121-11\,\sqrt{22}}-22\,\sqrt{22-2\,\sqrt{22}}\right)U}{22\,\sqrt{52-8\,\sqrt{22}}\,t} & \frac{\left(209\,\sqrt{2+2\,\sqrt{\frac{2}{11}}}+\sqrt{11+\sqrt{22}}\left(66+5\,\sqrt{22}\right)\right)U}{66\,\sqrt{26+4\,\sqrt{22}}\,t} \\
\frac{U}{t} & \frac{U^2}{t^2} & \frac{-9\,U}{2\,t} & -\left(\frac{U^2}{\sqrt{2}\,t^2}\right) & \frac{-3\,U}{\sqrt{2}\,t} & -\left(\frac{U}{\sqrt{2}\,t}\right) & \frac{4\,\left(-11+\sqrt{22}\right)}{11\,\sqrt{2-2\,\sqrt{\frac{2}{11}}}} & \frac{4\,\left(11+\sqrt{22}\right)}{11\,\sqrt{2+2\,\sqrt{\frac{2}{11}}}} \\
0 & 0 & -\left(\frac{U^2}{\sqrt{2}\,t^2}\right) & \frac{-4\,U}{t} & 4 & 0 & \frac{-\left(\left(99\,\sqrt{2-2\,\sqrt{\frac{2}{11}}}+3\,\sqrt{242-22\,\sqrt{22}}+11\left(\sqrt{44-4\,\sqrt{22}}+4\,\sqrt{11-\sqrt{22}}\right)\right)U\right)}{66\,\sqrt{52-8\,\sqrt{22}}\,t} & \frac{\left(-517\,\sqrt{4+4\,\sqrt{\frac{2}{11}}}+2\,\left(132\,\sqrt{2}-\sqrt{11}\right)\sqrt{11+\sqrt{22}}\right)U}{528\,\sqrt{26+4\,\sqrt{22}}\,t} \\
-\left(\frac{\sqrt{2}\,U}{t}\right) & 0 & \frac{-3\,U}{\sqrt{2}\,t} & 4 & \frac{-6\,U}{t} & -\left(\frac{U}{t}\right) & 0 & 0 \\
0 & 0 & -\left(\frac{U}{\sqrt{2}\,t}\right) & 0 & -\left(\frac{U}{t}\right) & \frac{-5\,U}{t} & \frac{-\left(36\left(11\,\sqrt{2-2\,\sqrt{\frac{2}{11}}}+\sqrt{242-22\,\sqrt{22}}\right)t^2+\left(6\,\sqrt{242-22\,\sqrt{22}}-11\left(\sqrt{44-4\,\sqrt{22}}+4\,\sqrt{11-\sqrt{22}}\right)\right)U^2\right)}{66\,\sqrt{52-8\,\sqrt{22}}\,t^2} & \frac{-24\,\sqrt{11}\,t^2-\left(11\,\sqrt{2}+2\,\sqrt{11}\right)U^2}{22\,\sqrt{2+2\,\sqrt{\frac{2}{11}}}\,t^2} \\
\frac{\left(1-\sqrt{\frac{2}{11}}\right)U^2}{\sqrt{2-2\,\sqrt{\frac{2}{11}}}\,t^2} & \frac{\left(11\,\sqrt{4-4\,\sqrt{\frac{2}{11}}}+14\,\sqrt{121-11\,\sqrt{22}}-22\,\sqrt{22-2\,\sqrt{22}}\right)U}{22\,\sqrt{52-8\,\sqrt{22}}\,t} & \frac{-4+4\,\sqrt{\frac{2}{11}}}{\sqrt{2-2\,\sqrt{\frac{2}{11}}}} & \frac{-\left(\left(99\,\sqrt{2-2\,\sqrt{\frac{2}{11}}}+3\,\sqrt{242-22\,\sqrt{22}}+11\left(\sqrt{44-4\,\sqrt{22}}+4\,\sqrt{11-\sqrt{22}}\right)\right)U\right)}{66\,\sqrt{52-8\,\sqrt{22}}\,t} & 0 & \frac{-\left(36\left(11\,\sqrt{2-2\,\sqrt{\frac{2}{11}}}+\sqrt{242-22\,\sqrt{22}}\right)t^2+\left(6\,\sqrt{242-22\,\sqrt{22}}-11\left(\sqrt{44-4\,\sqrt{22}}+4\,\sqrt{11-\sqrt{22}}\right)\right)U^2\right)}{66\,\sqrt{52-8\,\sqrt{22}}\,t^2} & \frac{3\left(17842\,\sqrt{2}-3370\,\sqrt{11}-4015\,\sqrt{52-8\,\sqrt{22}}\right)U}{16\,\sqrt{52-8\,\sqrt{22}}\,\left(-11+\sqrt{22}\right)^2\,t} & \frac{-\left(\left(69\,\sqrt{11}-121\,\sqrt{\frac{11+\sqrt{22}}{11-\sqrt{22}}}+11\,\sqrt{\frac{22\,(11+\sqrt{22})}{11-\sqrt{22}}}\right)U\right)}{528\,t} \\
\frac{-\left(\left(11+\sqrt{22}\right)U^2\right)}{11\,\sqrt{2+2\,\sqrt{\frac{2}{11}}}\,t^2} & \frac{\left(209\,\sqrt{2+2\,\sqrt{\frac{2}{11}}}+\sqrt{11+\sqrt{22}}\left(66+5\,\sqrt{22}\right)\right)U}{66\,\sqrt{26+4\,\sqrt{22}}\,t} & \frac{4+4\,\sqrt{\frac{2}{11}}}{\sqrt{2+2\,\sqrt{\frac{2}{11}}}} & \frac{\left(-517\,\sqrt{4+4\,\sqrt{\frac{2}{11}}}+2\,\left(132\,\sqrt{2}-\sqrt{11}\right)\sqrt{11+\sqrt{22}}\right)U}{528\,\sqrt{26+4\,\sqrt{22}}\,t} & 0 & \frac{-24\,\sqrt{11}\,t^2-\left(11\,\sqrt{2}+2\,\sqrt{11}\right)U^2}{22\,\sqrt{2+2\,\sqrt{\frac{2}{11}}}\,t^2} & -\left(\left(69\,\sqrt{11}-121\,\sqrt{\frac{11+\sqrt{22}}{11-\sqrt{22}}}+11\,\sqrt{\frac{22\,(11+\sqrt{22})}{11-\sqrt{22}}}\right)U\right) & \frac{-9\left(86+7\,\sqrt{22}+24\,\sqrt{26+4\,\sqrt{22}}\right)U}{4\,\sqrt{2+2\,\sqrt{\frac{2}{11}}}\,\left(11+\sqrt{22}\right)^{\frac{3}{2}}\,t}
\end{bmatrix}$$