$$
H_{40} = \begin{bmatrix}
-2h-6\mu+U & \frac{-11\mathrm{i}\,t}{12}-\frac{\mathrm{i}\,t}{\sqrt{3}} & 0 & \frac{3\mathrm{i}}{2}t+\frac{\sqrt{3}t}{2} & 0 & \frac{-\mathrm{i}}{\sqrt{2}}t-\frac{5t}{2\sqrt{6}} & \frac{-\mathrm{i}}{\sqrt{2}}t+\frac{5t}{2\sqrt{6}} & 0 & 0 & 0 & 0 & \frac{t}{3\sqrt{2}}-\frac{\mathrm{i}\,t}{\sqrt{6}} & 0 & 0 & 0 & \frac{-3\mathrm{i}}{4}t+\frac{\sqrt{3}t}{4} \\
\frac{-11t}{12}+\frac{\mathrm{i}\,t}{\sqrt{3}} & -2h-6\mu+U & 0 & 0 & \frac{3\mathrm{i}}{2}t-\frac{5t}{2\sqrt{3}} & 0 & 0 & 0 & 0 & 0 & -1\sqrt{\frac{3}{2}}t-\frac{\sqrt{2}t}{3} & 0 & \frac{-7\sqrt{\frac{18-6\sqrt{3}}{2}}t}{6\left(-3+\sqrt{3}\right)}+\frac{\sqrt{\frac{2-\sqrt{3}}{2}}t}{2\left(-3+\sqrt{3}\right)}+\mathrm{i}\left(\frac{-\left(\sqrt{\frac{18-6\sqrt{3}}{2}}t\right)}{2\left(-3+\sqrt{3}\right)}-\frac{\sqrt{\frac{2-\sqrt{3}}{2}}t}{2\left(-3+\sqrt{3}\right)}\right) & \frac{-t}{2\sqrt{3+\sqrt{3}}}-\frac{7t}{2\sqrt{3}\left(3+\sqrt{3}\right)}+\mathrm{i}\left(\frac{\sqrt{\frac{3}{3+\sqrt{3}}}t}{2}-\frac{t}{2\sqrt{3+\sqrt{3}}}\right) & \frac{-\mathrm{i}}{4}t-\frac{t}{4\sqrt{3}} & 0 \\
0 & 0 & -2h-6\mu+2U & \frac{-\mathrm{i}}{2}\sqrt{\frac{3}{2}}t-\frac{5t}{2\sqrt{2}} & 0 & 0 & 0 & \frac{\sqrt{\frac{3}{2}}t}{2}+\frac{\mathrm{i}\,t}{\sqrt{2}} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \sqrt{2}t+\mathrm{i}\,\sqrt{6}\,t \\
\frac{-3\mathrm{i}}{2}t+\frac{\sqrt{3}t}{2} & 0 & \frac{\mathrm{i}}{2}\sqrt{\frac{3}{2}}t-\frac{5t}{2\sqrt{2}} & -2h-6\mu+2U & \frac{-t}{4}-\frac{3\mathrm{i}}{4}\sqrt{3}\,t & 0 & 0 & \frac{\sqrt{\frac{3}{2}}t}{2}-\frac{3\mathrm{i}}{\sqrt{2}}t & 0 & \frac{3\mathrm{i}}{4}t-\frac{\sqrt{3}t}{4} & 0 & 0 & 0 & 0 & \frac{3\mathrm{i}}{4}-\frac{\mathrm{i}}{2}\sqrt{3}\,t & 0 \\
0 & \frac{-3\mathrm{i}}{2}t-\frac{5t}{2\sqrt{3}} & 0 & \frac{-t}{4}+\frac{3\mathrm{i}}{4}\sqrt{3}\,t & -2h-6\mu+2U & -\left(\frac{t}{\sqrt{2}}\right) & \frac{t}{\sqrt{2}} & 0 & \frac{-3\mathrm{i}}{4}t-\frac{\sqrt{3}t}{4} & 0 & 0 & -2\sqrt{\frac{2}{3}}t & 0 & 0 & 0 & \frac{t}{2}-\frac{\mathrm{i}}{2}\sqrt{3}\,t \\
\frac{3\mathrm{i}}{\sqrt{2}}t-\frac{5t}{2\sqrt{6}} & 0 & 0 & 0 & -\left(\frac{t}{\sqrt{2}}\right) & -2h-6\mu+U & 0 & 0 & 0 & \sqrt{\frac{3}{2}}t & \frac{-2t}{\sqrt{3}} & 0 & 0 & \frac{-\mathrm{i}}{2}\sqrt{\frac{3}{2}}t-\frac{t}{2\sqrt{2}} & 0 & \\
\frac{\mathrm{i}}{\sqrt{2}}t+\frac{5t}{2\sqrt{6}} & 0 & 0 & 0 & \frac{t}{\sqrt{2}} & 0 & -2h-6\mu+U & 0 & 0 & -\left(\sqrt{\frac{3}{2}}t\right) & \mathrm{i}\,t-\frac{t}{\sqrt{3}} & 0 & 0 & \frac{\mathrm{i}}{2}\sqrt{\frac{3}{2}}t-\frac{3t}{2\sqrt{2}} & 0 & \\
0 & 0 & 0 & \frac{\sqrt{\frac{3}{2}}t}{2}+\frac{3\mathrm{i}\,t}{\sqrt{2}} & 0 & 0 & 0 & -2h-6\mu+2U & \frac{\mathrm{i}}{2}\sqrt{\frac{3}{2}}t-\frac{3t}{2\sqrt{2}} & 0 & 0 & 0 & 0 & 0 & 0 & \\
0 & 0 & 0 & \frac{\sqrt{\frac{3}{2}}t}{2}-\frac{\mathrm{i}\,t}{\sqrt{2}} & 0 & \frac{3\mathrm{i}}{4}t-\frac{\sqrt{3}t}{4} & 0 & 0 & \frac{-\mathrm{i}}{2}\sqrt{\frac{3}{2}}t-\frac{3\mathrm{i}}{2\sqrt{2}}t & -2h-6\mu+2U & \frac{-3\mathrm{i}}{4}-\frac{1}{4}\sqrt{3}\,t & 0 & 0 & 0 & -\left(\sqrt{3}\,t\right) & \\
0 & 0 & 0 & \frac{-3\mathrm{i}}{4}t-\frac{\sqrt{3}t}{4} & 0 & \sqrt{\frac{3}{2}}t & -\left(\sqrt{\frac{3}{2}}t\right) & 0 & \frac{-3\mathrm{i}}{4}+\frac{\mathrm{i}}{4}\sqrt{3}\,t & -2h-6\mu+2U & 0 & 0 & 0 & 0 & 0 & \\
0 & \mathrm{i}\,\sqrt{\frac{2}{3}}t-\frac{\sqrt{2}t}{3} & 0 & 0 & 0 & \frac{-2t}{\sqrt{3}} & -\mathrm{i}\,t-\frac{t}{\sqrt{3}} & 0 & 0 & 0 & -2h-6\mu+U & \frac{-5t}{6}-\frac{\mathrm{i}\,t}{\sqrt{3}} & 0 & 0 & 0 & \\
\frac{t}{3\sqrt{2}}+\frac{\mathrm{i}\,t}{\sqrt{6}} & 0 & 0 & 0 & -2\sqrt{\frac{2}{3}}t & 0 & 0 & 0 & 0 & 0 & \frac{-5t}{6}+\frac{\mathrm{i}\,t}{\sqrt{3}} & -2h-6\mu+U & \frac{\sqrt{\frac{3}{2}}t}{\left(-3\sqrt{3}\right)^{\frac{3}{2}}}+\frac{t}{\sqrt{2}\left(-3\sqrt{3}\right)^{\frac{3}{2}}}+\mathrm{i}\left(\frac{-5\sqrt{\frac{3}{2}}t}{\left(-3\sqrt{3}\right)^{\frac{3}{2}}}+\frac{9t}{\sqrt{2}\left(-3\sqrt{3}\right)^{\frac{3}{2}}}\right) & -\left(\sqrt{\frac{2}{3\left(3+\sqrt{3}\right)}}t\right)+\frac{t}{\sqrt{2\left(3+\sqrt{3}\right)}}+\mathrm{i}\left(-\left(\sqrt{\frac{3}{2\left(3+\sqrt{3}\right)}}t\right)-\sqrt{\frac{3}{3+\sqrt{3}}}t\right) & \frac{-\mathrm{i}\,t}{\sqrt{2}}-\frac{t}{\sqrt{6}} & 0 \\
0 & \frac{-7\sqrt{\frac{18-6\sqrt{3}}{2}}t}{6\left(-3+\sqrt{3}\right)}+\frac{\sqrt{\frac{2-\sqrt{3}}{2}}t}{2\left(-3+\sqrt{3}\right)}+\mathrm{i} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\left(\sqrt{\frac{3}{18-6\sqrt{3}}}t\right)-\frac{3t}{\sqrt{18-6\sqrt{3}}\left(-3+\sqrt{3}\right)}+\mathrm{i}\left(\frac{9\sqrt{\frac{3}{18-6\sqrt{3}}}t}{-3+\sqrt{3}}-\frac{15t}{\sqrt{18-6\sqrt{3}}\left(-3+\sqrt{3}\right)}\right) & -2h-6\mu & 0 & 0 & \frac{t}{\sqrt{12-4\sqrt{3}}}+\frac{\sqrt{9-3\sqrt{3}}t}{6-2\sqrt{3}}+\mathrm{i}\left(\frac{3t}{\sqrt{12-4\sqrt{3}}}+\frac{\sqrt{9-3\sqrt{3}}t}{6-2\sqrt{3}}\right) \\
0 & \frac{-t}{2\sqrt{3+\sqrt{3}}}-\frac{7t}{2\sqrt{3}\left(3+\sqrt{3}\right)}+\mathrm{i}\left(\frac{-\left(\sqrt{\frac{3}{3+\sqrt{3}}}t\right)}{2}+\frac{t}{2\sqrt{3+\sqrt{3}}}\right) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\left(\sqrt{\frac{3}{3\left(3+\sqrt{3}\right)}}t\right)+\frac{t}{\sqrt{2\left(3+\sqrt{3}\right)}}+\mathrm{i}\left(\sqrt{\frac{3}{2\left(3+\sqrt{3}\right)}}t+\sqrt{\frac{2}{3+\sqrt{3}}}t\right) & -2h-6\mu & 0 & 0 & \frac{\sqrt{\frac{3}{3+\sqrt{3}}}t}{2}-\frac{t}{2\sqrt{3+\sqrt{3}}}+\mathrm{i}\left(\frac{-\left(\sqrt{\frac{3}{3+\sqrt{3}}}t\right)}{2}+\frac{t}{2\sqrt{3+\sqrt{3}}}\right) \\
0 & \frac{1}{4}t-\frac{t}{4\sqrt{3}} & 0 & \frac{3t}{2}+\frac{\mathrm{i}}{2}\sqrt{3}\,t & 0 & \frac{\mathrm{i}}{2}\sqrt{\frac{3}{2}}t-\frac{t}{2\sqrt{2}} & \frac{-\mathrm{i}}{2}\sqrt{\frac{3}{2}}t-\frac{3t}{2\sqrt{2}} & 0 & -\left(\sqrt{3}\,t\right) & 0 & \frac{t}{\sqrt{2}}-\frac{t}{\sqrt{6}} & 0 & 0 & 0 & -2h-6\mu+U & \frac{-3\mathrm{i}}{4}-\frac{\mathrm{i}}{4}\sqrt{3}\,t \\
\frac{3\mathrm{i}}{4}t+\frac{\sqrt{3}t}{4} & 0 & \sqrt{2}t-\mathrm{i}\,\sqrt{6}\,t & 0 & \frac{t}{2}+\frac{\mathrm{i}}{2}\sqrt{3}\,t & 0 & 0 & 0 & 0 & 0 & 0 & \frac{-\left(\sqrt{\frac{18-6\sqrt{3}}{2}}t\right)}{2\left(-3+\sqrt{3}\right)}-\frac{\sqrt{\frac{2-\sqrt{3}}{2}}t}{2\left(-3+\sqrt{3}\right)}+\mathrm{i}\left(\frac{\sqrt{\frac{18-6\sqrt{3}}{2}}t}{2\left(-3+\sqrt{3}\right)}+\frac{3\sqrt{\frac{2-\sqrt{3}}{2}}t}{2\left(-3+\sqrt{3}\right)}\right) & \frac{\sqrt{\frac{3}{3+\sqrt{3}}}t}{2}-\frac{t}{2\sqrt{3+\sqrt{3}}}+\mathrm{i}\left(\frac{\sqrt{\frac{3}{3+\sqrt{3}}}t}{2}-\frac{3t}{2\sqrt{3+\sqrt{3}}}\right) & \frac{-3t}{4}+\frac{\mathrm{i}}{4}\sqrt{3}\,t & -2h-6\mu+U
\end{bmatrix}
$$