$$
H_Z = \begin{bmatrix}
B_0 g_e\mu_B + \frac{B_0 g_{n1}\mu_N}{2} + \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & \frac{B_0 g_{n1}\mu_N}{2} + \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & \frac{B_0 g_{n1}\mu_N}{2} + \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & -B_0 g_e\mu_B + \frac{B_0 g_{n1}\mu_N}{2} + \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & B_0 g_e\mu_B + \frac{B_0 g_{n1}\mu_N}{2} - \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & \frac{B_0 g_{n1}\mu_N}{2} - \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & \frac{B_0 g_{n1}\mu_N}{2} - \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & -B_0 g_e\mu_B + \frac{B_0 g_{n1}\mu_N}{2} - \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & B_0 g_e\mu_B - \frac{B_0 g_{n1}\mu_N}{2} + \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{B_0 g_{n1}\mu_N}{2} + \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{B_0 g_{n1}\mu_N}{2} + \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -B_0 g_e\mu_B - \frac{B_0 g_{n1}\mu_N}{2} + \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & B_0 g_e\mu_B - \frac{B_0 g_{n1}\mu_N}{2} - \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{B_0 g_{n1}\mu_N}{2} - \frac{B_0 g_{n2}\mu_N}{2} & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -\frac{B_0 g_{n1}\mu_N}{2} - \frac{B_0 g_{n2}\mu_N}{2} & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -B_0 g_e\mu_B - \frac{B_0 g_{n1}\mu_N}{2} - \frac{B_0 g_{n2}\mu_N}{2}
\end{bmatrix}
$$

$$
\begin{aligned}
&\left|1,1\right\rangle \otimes \left|+\tfrac{1}{2},+\tfrac{1}{2}\right\rangle \\
&\left|1,0\right\rangle \otimes \left|+\tfrac{1}{2},+\tfrac{1}{2}\right\rangle \\
&\left|0,0\right\rangle \otimes \left|+\tfrac{1}{2},+\tfrac{1}{2}\right\rangle \\
&\left|1,-1\right\rangle \otimes \left|+\tfrac{1}{2},+\tfrac{1}{2}\right\rangle \\
&\left|1,1\right\rangle \otimes \left|+\tfrac{1}{2},-\tfrac{1}{2}\right\rangle \\
&\left|1,0\right\rangle \otimes \left|+\tfrac{1}{2},-\tfrac{1}{2}\right\rangle \\
&\left|0,0\right\rangle \otimes \left|+\tfrac{1}{2},-\tfrac{1}{2}\right\rangle \\
&\left|1,-1\right\rangle \otimes \left|+\tfrac{1}{2},-\tfrac{1}{2}\right\rangle \\
&\left|1,1\right\rangle \otimes \left|-\tfrac{1}{2},+\tfrac{1}{2}\right\rangle \\
&\left|1,0\right\rangle \otimes \left|-\tfrac{1}{2},+\tfrac{1}{2}\right\rangle \\
&\left|0,0\right\rangle \otimes \left|-\tfrac{1}{2},+\tfrac{1}{2}\right\rangle \\
&\left|1,-1\right\rangle \otimes \left|-\tfrac{1}{2},+\tfrac{1}{2}\right\rangle \\
&\left|1,1\right\rangle \otimes \left|-\tfrac{1}{2},-\tfrac{1}{2}\right\rangle \\
&\left|1,0\right\rangle \otimes \left|-\tfrac{1}{2},-\tfrac{1}{2}\right\rangle \\
&\left|0,0\right\rangle \otimes \left|-\tfrac{1}{2},-\tfrac{1}{2}\right\rangle \\
&\left|1,-1\right\rangle \otimes \left|-\tfrac{1}{2},-\tfrac{1}{2}\right\rangle
\end{aligned}
$$