The known construction of a generic polynomial for the quaternion group $Q_8$ over $\mathbb{Q}$ is generalised to produce generic polynomials for larger quaternion groups over fields containing appropriate ‘cosines’, such as $\mathbb{R}$. Since $Q_{16}$ is known to \textit{not} have a generic polynomial over $\mathbb{Q}$, these ‘cosines’ are necessary. In the case of $Q_{16}$, we get a generic polynomial over $\mathbb{Q}(\sqrt{2})$. (Received February 10, 2014)