Let $k$ be a perfect field of characteristic $p$. There is a categorical equivalence between Dieudonné modules and finite abelian $k$-Hopf algebras of $p$-power order. In the case where the Dieudonné module is killed by a power of $F$ and $V$ the corresponding Hopf algebra is local with local linear dual. Here, we describe all Dieudonné modules killed by a power of $F$ and $V$ with the property that their corresponding Hopf algebras are generated by as $k$-algebras by (at most) two elements. Such a Dieudonné module arises as an extension of two modules, each of which corresponding to a monogenic Hopf algebra. We compute this extension group, and give conditions for when the constructed Hopf algebra is again monogenic. (Received September 19, 2007)