$$
\begin{array}{ccc}
\left(\mathscr{A}^{\mathrm{op}}\right)^{\mathbb{N}^{\mathrm{op}}} & \xrightarrow{F:=(-,Y)} & \mathbf{Ab}^{\mathbb{N}^{\mathrm{op}}} \\
{\scriptstyle G:=\varprojlim} \Big\downarrow & & \Big\downarrow {\scriptstyle G:=\varprojlim} \\
\mathscr{A}^{\mathrm{op}} & \xrightarrow[F:=(-,Y)]{} & \mathbf{Ab}
\end{array}
$$