Ampère's Law:

$$\nabla \times \boldsymbol{B} = \mu_0 \boldsymbol{J}$$

Consider taking the divergence of this equation

$$\nabla \cdot (\nabla \times \boldsymbol{B}) = \mu_0 \nabla \cdot \boldsymbol{J}$$

Mathematically, the divergence of any curl is zero, but $\nabla \cdot \boldsymbol{J} \neq 0$ in general. Therefore, the usual form of Ampère's law is not general. But, the current density is subject to the continuity equation which says that

$$\nabla \cdot \boldsymbol{J} = -\frac{\partial \rho}{\partial t}$$

and the charge density may be related to the electric field using Gauss's law

$$\nabla \cdot \boldsymbol{E} = \rho / \epsilon_0$$

so that we can write

$$\frac{\partial \rho}{\partial t} = \nabla \cdot \left(\epsilon_0 \frac{\partial \boldsymbol{E}}{\partial t} \right)$$

Now, we replace $\mu_0 \boldsymbol{J}$ by $\mu_0 \boldsymbol{J} + \mu_0 \epsilon_0 \frac{\partial \boldsymbol{E}}{\partial t}$ to get the generalized Ampère's law

$$\nabla \times \boldsymbol{B} = \mu_0 \boldsymbol{J} + \mu_0 \epsilon_0 \frac{\partial \boldsymbol{E}}{\partial t}$$

As you can see, taking the divergence of this equation results in the continuity equation, not an inequality.