Differentielle Form

$$\frac{\partial \varrho}{\partial t} + \mathrm{div}(\varrho \vec{v}) = 0$$

$$\varrho \frac{\partial \vec{v}}{\partial t} + (\varrho \vec{v} \cdot \nabla) \vec{v} = \vec{f}_0 + \mathrm{div}\mathbf{T} = \vec{f}_0 - \mathrm{grad} p + \mathrm{div}\mathbf{T}' \tag{3.33}$$

$$\varrho T \frac{\mathrm{d}s}{\mathrm{d}t} = \varrho \frac{\mathrm{d}e}{\mathrm{d}t} - \frac{p}{\varrho} \frac{\mathrm{d}\varrho}{\mathrm{d}t} = -\mathrm{div} \vec{q} + \mathbf{T}' : \mathbf{D}$$

Integralform

$$\frac{\partial}{\partial t} \iiint \varrho \, \mathrm{d}^3 V + \oiint \varrho (\vec{v} \cdot \vec{v}ecn) \, \mathrm{d}^2 A = 0 \tag{3.34}$$

$$\frac{\partial}{\partial t} \iiint \varrho \vec{v} \, \mathrm{d}^3 V + \oiint \varrho \vec{v} (\vec{v} \cdot \vec{n}) \, \mathrm{d}^2 A = \iiint f_0 \, \mathrm{d}^3 V + \oiint \vec{n} \cdot T \, \mathrm{d}^2 A \tag{3.35}$$

$$\frac{\partial}{\partial t} \iiint \left(\frac{1}{2} v^2 + e \right) \varrho \, \mathrm{d}^3 V + \oiint \left(\frac{1}{2} v^2 + e \right) \varrho \, (\vec{v} \cdot \vec{n}) \, \mathrm{d}^2 A = \tag{3.36}$$

$$- \oiint (\vec{q} \cdot \vec{v}ecn) \, \mathrm{d}^2 A + \iiint \left(\vec{v} \cdot \vec{f}_0 \right) \mathrm{d}^3 V + \oiint (\vec{v} \cdot \vec{n} \, \mathbf{T}) \, \mathrm{d}^2 A.$$