25.)

$V = 5\,\ell \quad p = 0{,}1\,MPa \quad N_2 \quad Q = 1{,}5\,kJ \quad \kappa = 1{,}4 \quad p_2 = ?$

$\boxed{\Delta E_b = Q + W} \quad \boxed{pV = nRT} \quad \boxed{\Delta E_b = \frac{f}{2} nR\Delta T} \quad \boxed{\kappa = \frac{c_p}{c_v}}$

$\boxed{Q = C\Delta T} \quad \boxed{C = cm = c^m \cdot n}$

Ha $V = áll$ $W = 0$

$\Delta E_b = Q$

$\frac{f}{2} nR\Delta T = c_v^m n\Delta T$

$c_v^m = \frac{f}{2} R$

Ha $p = áll$ $W = -p\Delta V$

$pV = nRT$

$p\Delta V = nR\Delta T$

$\frac{f}{2} nR\Delta T = c_p^m n\Delta T - p\Delta V$

$\frac{f}{2} nR\Delta T = c_p^m n\Delta T - nR\Delta T$

$\left(\frac{f}{2}+1\right) nR\Delta T = c_p^m n\Delta T$

$c_p^m = \left(\frac{f}{2}+1\right) R$

$\kappa = \frac{c_p}{c_v} = \frac{c_p^m}{c_v^m} = \frac{\frac{f}{2}+1}{\frac{f}{2}} = \frac{f+2}{f} = 1{,}4$

$f + 2 = 1{,}4 f$

$0{,}4 f = 2$

$f = 5$

Most $V = áll$

$\Delta E_b = Q$

$\frac{f}{2} nR\Delta T = Q \qquad pV = nRT$

$\frac{5}{2} \Delta p V = Q \qquad \Delta p V = nR\Delta T$

$\Delta p = \frac{2}{5} \frac{Q}{V} = \frac{2}{5} \frac{1500\,J}{0{,}005\,m^3} = 120\,000\,Pa$

$p_2 = p_1 + \Delta p = 0{,}1\,MPa + 0{,}12\,MPa = \underline{0{,}22\,MPa}$