62.1 $m = 300\,l$ Wasser

$\vartheta_K = 18\,^\circ C$

$\vartheta_W = 85\,^\circ C$

$$\Delta\vartheta = \vartheta_W - \vartheta_K = 85 - 18 = 67\,^\circ C$$

$$Q = m \cdot c \cdot \Delta\vartheta = 300 \cdot 4{,}19 \cdot 67 =$$

$$= 84{,}2\,MJ$$

62.2 $m = 10\,kg$

$\vartheta_K = 15\,^\circ C$

$Q = 3000\,kJ$

$$\Delta\vartheta = \frac{Q}{m \cdot c} = \frac{3000}{10 \cdot 4{,}19} =$$

$$= 71{,}54\,^\circ C$$

$$\vartheta_W = \vartheta_K + \Delta\vartheta =$$

$$= 15 + 71{,}6 = 86{,}6\,^\circ C$$

62.3

$V = 3000\ dm^3$

$\rho = 0{,}89\ kg/dm^3$

$c = 1{,}9\ kg/kg\ K$

$\vartheta_K = 15°C \qquad \vartheta_W = 45°C$

$\Delta\vartheta = \vartheta_W - \vartheta_K = 45 - 15 = 30°C$

$m = V \cdot \rho = 3000 \cdot 0{,}89 = 2670\ kg$

$Q = m \cdot c \cdot \Delta\vartheta = 2670 \cdot 1{,}9 \cdot 30 =$

$= 152\,190\ kJ$

$= 152\ MJ$

62.4 ~~$P = 2{,}2\ kW$~~ ~~$t = 8\ h$~~

$m = 78\ kg$

$\vartheta_K = 20\,^\circ C$ $\vartheta_W = 600\,^\circ C$

$Q = 54\,500\ kJ$

$$\Delta\vartheta = \vartheta_W - \vartheta_K = 600 - 20 = 580\,^\circ C$$

$$c = \frac{Q}{m \cdot \Delta\vartheta} = \frac{54\,500}{78 \cdot 580} =$$

$$= 1{,}2\ \frac{kJ}{kg\,K}$$

62.5 $m_W = 80\ kg$ $\vartheta_W = 65\,^\circ C$

$m_K = 70\ kg$ $\vartheta_K = 9\,^\circ C$

$$\vartheta_M = \frac{\vartheta_K \cdot m_K + \vartheta_W \cdot m_W}{m_K + m_W} =$$

$$= \frac{80 \cdot 65 + 70 \cdot 9}{80 + 70} = 38{,}9\,^\circ C$$

$$Q_K = m_K \cdot \vartheta_K \cdot c =$$

$$= 70 \cdot 9 \cdot 4{,}19 = 2638{,}7\ kJ$$

$$Q_W = m_W \cdot \vartheta_W \cdot c =$$

$$= 80 \cdot 65 \cdot 4{,}19 = 21788\ kJ$$

$$m_{ges} = m_K + m_W = 70 + 80 = 150\ kg$$

$$Q_{ges} = Q_K + Q_W = 2638{,}7 + 21788 =$$

$$= 24427{,}7\ kJ$$

$$\vartheta = \frac{Q_g}{m_g \cdot c} = \frac{24427{,}7\ k}{150 \cdot 4{,}19} = 38{,}9\,°C$$

63/1 $P = 80\,W$ $t = 20'$

$W = P \cdot t = 80 \cdot 20 = 1600\,Wmin$

$= 96000\,Ws$

$= 96\,kJ$

63/2 $R = 0{,}8\,\Omega$ $I = 25\,A$

$t = 15'$

$P = I^2 \cdot R = 25^2 \cdot 0{,}8 = 500\,W$

$U = I \cdot R = 25 \cdot 0{,}8 = 20\,V$

$P = U \cdot I = 20 \cdot 25 = 500\,W$

$W = P \cdot t = 500 \cdot 15 = 7500\,Wmin$

$= 125\,Wh$

$= 450\,kWs = 450\,kJ$

63/3 $t = 1'$ $m = 10\,kg$

$\vartheta_K = 15°C$ $\vartheta_W = 40°C$

$\eta = 0,97$

$$\Delta\vartheta = \vartheta_W - \vartheta_K = 40 - 15 = 25°C$$

$$Q_N = m \cdot c \cdot \Delta\vartheta = 10 \cdot 4,19 \cdot 25 = 1047,5\,kJ$$

$$Q_S = \frac{Q_N}{\eta} = \frac{1047,5\,kJ}{0,97} = 1079,9\,kJ$$

$$P = \frac{Q_S}{t} = \frac{1079,9\,kJ}{1 \cdot 60\,s} = 18\,kW$$

$$Q_g = Q_S \cdot \frac{m_{200}}{m_{10}} = 1079,9 \cdot \frac{200}{10} = 21598\,kJ$$

63/7 $t = 12{,}5'$ $m = 3\,kg$

$\vartheta_k = 15°C$ $\vartheta_w = 98°C$

$\eta = 0{,}7$

$U = 230\,V$

$\Delta\vartheta = \vartheta_w - \vartheta_k = 98 - 15 = 83°C$

$Q_N = m \cdot c \cdot \Delta\vartheta = 3 \cdot 4{,}19 \cdot 83 =$

$= 1043{,}31\,kJ$

$Q_S = \frac{Q_N}{\eta} = \frac{1043{,}3}{0{,}7} = 1490\,kJ$

$P = \frac{Q_S}{t} = \frac{1490\,kWs}{12{,}5 \cdot 60s} = 1{,}987\,kW$

$I = \frac{P}{U} = \frac{1{,}987\,k}{230} = 8{,}64\,A$

$R = \frac{U}{I} = \frac{230}{8{,}64} = 26{,}6\,\Omega$