Isotropic efficiency compressor

Refrigerant-134a enters the compressor of a refrigerator as a saturated vapor at 0.12 MPa (point 1) and leaves as a superheated vapor with $T = 50°C$ at 0.9 MPa (point 2). It is then isobarically cooled in the condenser to a saturated liquid state (point 3) and finally an expansion valve reduces the pressure to 0.12 MPa (point 4). The next few questions will be about this cycle, so it might be convenient to make a table with all the information.

What is the isotropic efficiency of the compressor?

To answer this question we need the enthalpy values at point 1 and 2, and the ideal point 2 (2_s). We know already that $h_1 = 236.99 kJ/kg$ and $h_2 = 284.79 kJ/kg$, so a logical first step is to determine the enthalpy value of point 2_s. In table A-13 we start looking for an entropy value of 0.9479 kJ/kgK (corresponding to the entropy at point 1) at $p = 0.9 MPa$. The exact value is not present, but we know we have to iterate between the value for 40 and $50°C$.

$$\frac{s_{50} - s_1}{s_{50} - s_{40}} = \frac{0.9661 - 0.9479}{0.9661 - 0.9328} = 0.547 \tag{1}$$

Now calculate h_{2s}

$$h_{2s} = 0.547 \cdot \Delta_h + h_{40} = 0.547 \cdot 10.6 + 274.19 = 279.98 kJ/kg \tag{2}$$

Filling in the formula for isotropic efficiency gives

$$\eta_{isocomp} = \frac{h_{2s} - h_1}{h_2 - h_1} = \frac{279.98 - 236.99}{284.79 - 236.99} = 0.9 \tag{3}$$

0.9 is correct.