

Sl. No	Process	Workdone (W) kJ	Change in Internal Energy (ΔU) kJ	Heat Transfer (Q) kJ	Change in Enthalpy (ΔH) kJ	Change in Entropy (ΔS) (kJ/K)	P.V.T. Relations.
1.	constant Volume Process $V=C$	Zero	$mC_v(T_2 - T_1)$	$mC_v(T_2 - T_1)$	$mC_p(T_2 - T_1)$	$mC_v \ln \left(\frac{T_2}{T_1} \right)$ (or) $mC_v \ln \left(\frac{P_2}{P_1} \right)$	$\frac{P_1}{T_1} = \frac{P_2}{T_2}$
2.	constant Pressure Process $P=C$	$P(V_2 - V_1)$ (or) $mR(T_2 - T_1)$	$mC_v(T_2 - T_1)$	$mC_p(T_2 - T_1)$	$mC_p(T_2 - T_1)$	$mC_p \ln \left(\frac{T_2}{T_1} \right)$ (or) $mC_p \ln \left(\frac{V_2}{V_1} \right)$	$\frac{V_1}{T_1} = \frac{V_2}{T_2}$
3.	constant Temperature Process $T=C$	$P_1 V_1 \ln \left(\frac{V_2}{V_1} \right)$ (or) $mRT_1 \ln \left(\frac{V_2}{V_1} \right)$	Zero	$P_1 V_1 \ln \left(\frac{V_2}{V_1} \right)$ (or) $mRT_1 \ln \left(\frac{V_2}{V_1} \right)$	Zero	$mR \ln \left(\frac{V_2}{V_1} \right)$ (or) $mR \ln \left(\frac{P_2}{P_1} \right)$	$P_1 V_1 = P_2 V_2$
4.	Reversible adiabatic Process (or) Isentropic Process $(P_v = c)$	$\frac{P_1 V_1 - P_2 V_2}{\gamma - 1}$ (or) $\frac{mR(T_1 - T_2)}{\gamma - 1}$	$mC_v(T_2 - T_1)$	Zero	$mC_p(T_2 - T_1)$	Zero	$\left(\frac{P_1}{P_2} \right)^{\frac{1}{\gamma}} = \left(\frac{V_1}{V_2} \right)^{\gamma}$ $\left(\frac{T_2}{T_1} \right)^{\frac{1}{\gamma-1}} = \left(\frac{P_2}{P_1} \right)^{\frac{1}{\gamma-1}}$

<p>S.</p> <p>Polytropic process ($PV^n = c$)</p>	$\frac{P_1 V_1 - P_2 V_2}{n-1}$ <p>(or)</p> $\frac{mR(T_1 - T_2)}{n-1}$	$mC_v(T_2 - T_1)$	$W \times \left(\frac{\gamma - n}{\gamma - 1} \right)$	$mC_p(T_2 - T_1)$	$mR \ln \left(\frac{V_2}{V_1} \right) + mC_v \ln \left(\frac{T_2}{T_1} \right)$ <p>(or)</p> $mR \ln \left(\frac{V_2}{V_1} \right) \times \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$
<p>(1) $P_1 V_1^n = P_2 V_2^n$</p> <p>(2) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^n$</p> <p>(3) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p>	<p>(4) $\frac{P_1 V_1}{P_2 V_2} = \left(\frac{V_2}{V_1} \right)^{n-1}$</p> <p>(5) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{n-1} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p>	<p>(6) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p> <p>(7) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p>	<p>(8) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p> <p>(9) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p>	<p>(10) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p> <p>(11) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p>	<p>(12) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p> <p>(13) $\frac{P_1}{P_2} = \left(\frac{V_2}{V_1} \right)^{\frac{n-1}{n}} \left(\frac{T_2}{T_1} \right)^{\frac{n-1}{n}}$</p>