Load Voltage V ≧ 0.7 [pu] ,

$$P_L = P_\alpha \; V \; f(V)\left(1+\Delta f \bullet \frac{\beta}{100}\right) + P_2 \; V^2 \; \left(1 - f(V)\right)$$

Load Voltage V < 0.7 [pu] ,

$$P_L = P_\alpha \; V^2 \; f(V)\left(1+\Delta f \bullet \frac{\beta}{100}\right) + P_2 \; V^2 \; \left(1 - f(V)\right)$$

No relation to Load Voltage V

$$Q_L = Q_i \left(\frac{V}{V_i}\right)^2$$

where $$f(V) = \frac{\tanh\{k\,(V-0.7)\}+1}{2}$$

P_α and P_2 are decided to satisfy the following equations

$$\begin{cases} P_i = P_\alpha \; V_i^2 \; f(V_i) + P_2 \; V_i^2 \; \left(1 - f(V_i)\right) \\ \Delta L = P_\alpha \; V_i - P_2 \; V_i^2 \end{cases}$$

β : Frequency Bias [% / Hz],
k : Constant (= 10.0) ,
ΔL / Li : Constant (= 0.15)

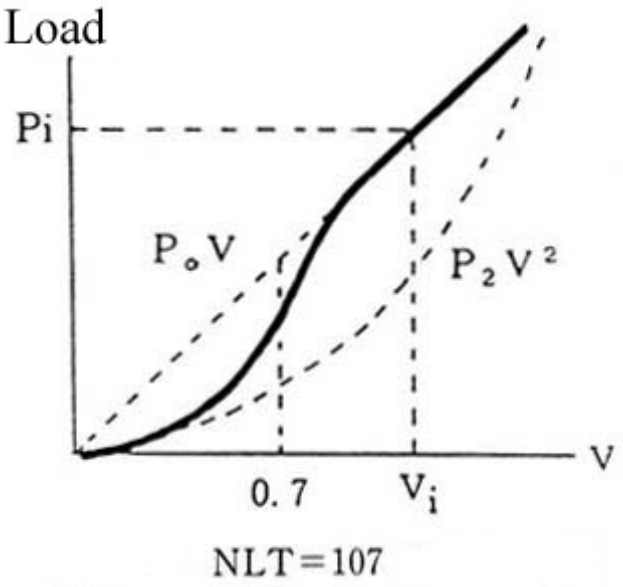

Fig. 1.5 Load Model NLT = 107