Rectifier Tables: Triphasic Controlled

Diego Trapero

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1 Rectifier Tables

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1.1 Triphasic Controlled Half Wave Rectifier, R vs RL load

What	3Φ Controlled HWR R load	3Φ Controlled HWR RL load
Circuit Diagram	$\begin{array}{c c} v_i & i_i \\ \hline v_i & i_i \\ \hline v_i & i_i \\ \hline \end{array} \qquad \begin{array}{c} v_i \\ \hline v_i & i_i \\ \hline \end{array}$	
v_o	27	27
v_R	27	27
Peaks/period	3 peaks/period	3 peaks/period
Period		
Integration limits		
Load Voltage		
$ar{v_o}(lpha)$		$\bar{v_o} = \frac{1}{\frac{2\pi}{3}} \int_{\frac{\pi}{6} + \alpha}^{\frac{5\pi}{6} + \alpha} V_{PN} \sin(\theta) d\theta$ $\bar{v_o} = \frac{3V_{PN}}{2\pi} [-\cos(\theta)]_{\frac{\pi}{6} + \alpha}^{\frac{5\pi}{6} + \alpha}$ $\bar{v_o} = \frac{3\sqrt{3}}{2\pi} V_{PN} \cos(\alpha)$
Thyristor table		

i_o	27	27
i_i	27	2π

1.2 Triphasic Controlled Full Wave Rectifier, R vs RL load

What	3Φ Controlled FWR R load	3Φ Controlled FWR RL load
Circuit Diagram		$T1$ v_i
v_o	φ τ	2π
v_R	27	27
Peaks/period	6 peaks/period	6 peaks/period
Period		
Integration limits		$\frac{\pi}{3} + \alpha, \frac{2\pi}{3} + \alpha$
Load Voltage		
$ar{v_o}(lpha)$		$\bar{v_o} = \frac{1}{\frac{\pi}{3}} \int_{\frac{\pi}{3} + \alpha}^{\frac{2\pi}{3} + \alpha} V_{LL} \sin(\theta) d\theta$ $\bar{v_o} = \frac{3V_{LL}}{\pi} [-\cos(\theta)]_{\frac{\pi}{3} + \alpha}^{\frac{2\pi}{3} + \alpha}$ $\bar{v_o} = \frac{3}{\pi} V_{LL} \cos(\alpha)$
		π^{-22} ()

i_o	27	277
i_i	27	27