Rectifier Tables: Triphasic Controlled

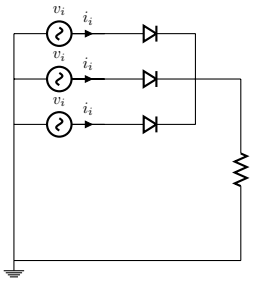
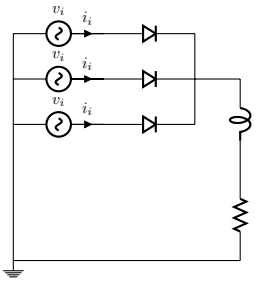
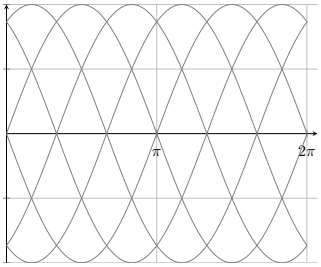
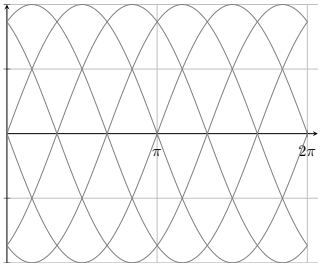
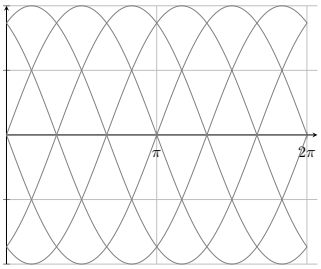
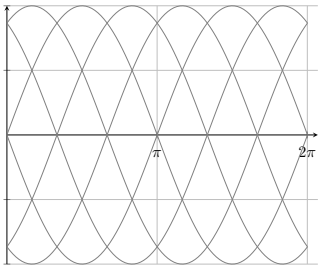
Diego Trapero

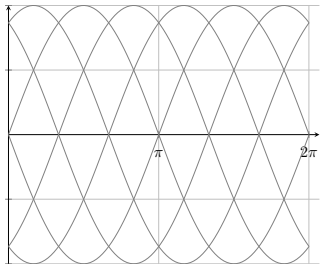
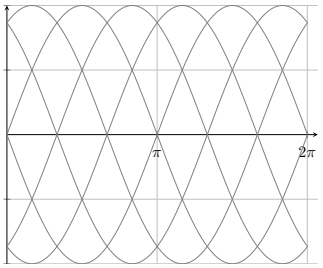
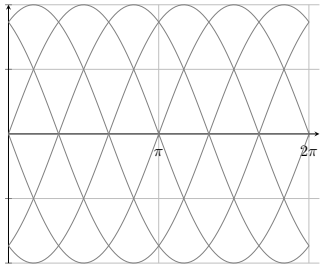
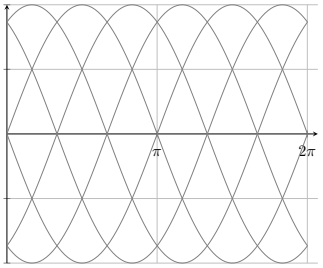
Table of contents

1 Rectifier Tables

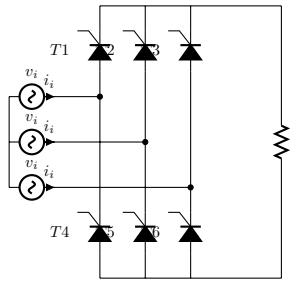
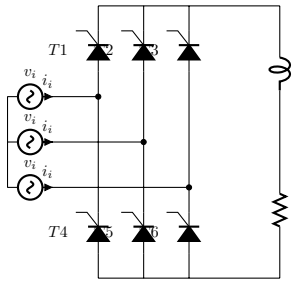
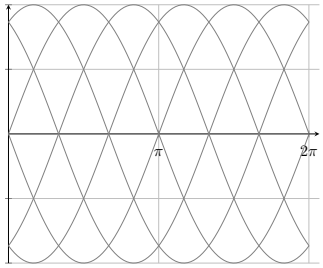
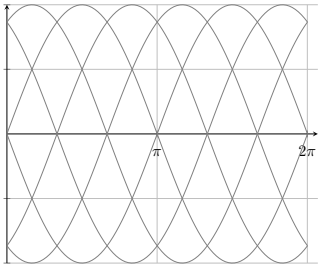
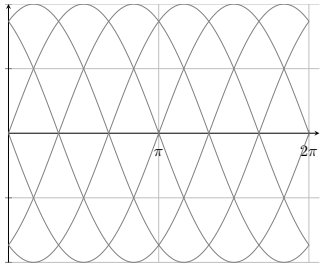
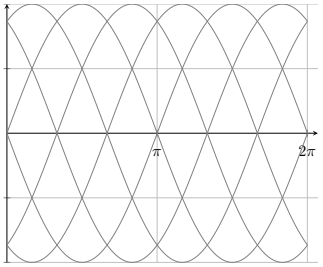
1. Monophasic Uncontrolled Rectifiers with R load
2. Monophasic Uncontrolled Full Wave Rectifier loads
3. Monophasic Controlled Full Wave Rectifier, R vs RL load
4. Triphasic Uncontrolled Rectifiers with R load
5. **Triphasic Controlled Half Wave Rectifier, R vs RL load**
6. **Triphasic Controlled Full Wave Rectifier, R vs RL load**

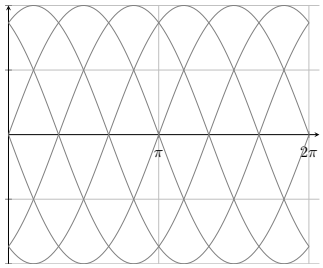
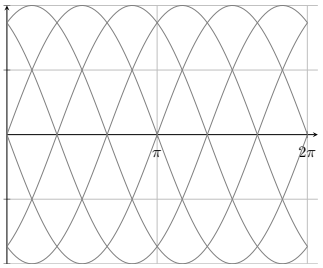
1.1 Triphasic Controlled Half Wave Rectifier, R vs RL load

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

i_o		
i_i		

1.2 Triphasic Controlled Full Wave Rectifier, R vs RL load

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

i_o		
i_i