Rectifier Tables: Triphasic Uncontrolled

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Table of contents

1	Rectifier Tables	2
	1.1 Triphasic Uncontrolled Rectifiers with R load	3

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 Uncontrolled Rectifiers with R load

What	3Φ Half Wave Rectifier	3Φ Full Wave Rectifier
Circuit Diagram	$\begin{array}{c c} v_i & i_i \\ \hline v_i & i_i \\ \hline \hline v_i & i_i \\ \hline \hline \end{array} \qquad \begin{array}{c c} v_i & i_i \\ \hline \end{array}$	$D1 \times D2 \times D3 \times$ $v_i i_i v_i i_i v_i i_i v_i i_i v_i i_i v_i i_i v_i v_i $
v_o	27	27
Peaks/period	3 peaks/period	3 peaks/period
Period	$\frac{2\pi}{3}$	$\frac{2\pi}{6} = \frac{\pi}{3}$
Integration limits	$\frac{\pi}{6}, \frac{5\pi}{6}$	$\frac{\pi}{3}, \frac{2\pi}{3}$
Load Voltage	Phase Voltage	Line Voltage
	I	
$ar{v_o}$	$\bar{v_o} = \frac{1}{\frac{2\pi}{3}} \int_{\frac{\pi}{6}}^{\frac{5\pi}{6}} V_{PN} \sin\left(\theta\right) d\theta$ $\bar{v_o} = \frac{3V_{PN}}{2\pi} \left[-\cos\left(\theta\right)\right]_{\frac{\pi}{6}}^{\frac{5\pi}{6}}$ $\bar{v_o} = \frac{3\sqrt{3}}{2\pi} V_{PN}$	$\bar{v_o} = \frac{1}{\frac{\pi}{3}} \int_{\frac{\pi}{3}}^{\frac{2\pi}{3}} V_{LL} \sin(\theta) d\theta$ $\bar{v_o} = \frac{3V_{LL}}{\pi} \left[-\cos(\theta) \right]_{\frac{3\pi}{3}}^{\frac{2\pi}{3}}$ $\bar{v_o} = \frac{3}{\pi} V_{LL}$
$ar{v_o}$ Diode table	$\bar{v_o} = \frac{3V_{PN}}{2\pi} \left[-\cos\left(\theta\right) \right]_{\frac{\pi}{6}}^{\frac{5\pi}{6}}$	$\bar{v_o} = \frac{3V_{LL}}{\pi} \left[-\cos\left(\theta\right) \right]_{\frac{\pi}{3}}^{\frac{2\pi}{3}}$

